

Moving towards sustainable cities

An assessment of Dutch local authorities' strategic approach to achieving comprehensive sustainability in urban development.

December 18, 2011
Master's Thesis – 30 EC
Jason Young – 3408795
MSc Sustainable Development
Environmental Policy and Management (EPM)
Utrecht University
j.m.young@students.uu.nl
Molukkenstraat 18
3531 WD Utrecht

Acknowledgements

This thesis project has been a part of the Master in Sustainable Development at Utrecht University, faculty of Geosciences. This research has allowed me to apply the coursework I've taken in environmental policy, governance and urban geography and apply it to a field of my interest, sustainable cities and urban development. The thesis has certainly been a journey in and of itself as the topic has evolved significantly from my original brainstorming while writing the thesis proposal to its final form printed here.

This journey would not have been possible without the dedication and continued patience and feedback I received from my supervisor, Peter Driessen and the many experts that I've interviewed throughout the different phases of this project.

I'm especially grateful for the time and feedback provided by Nic Frederiks, Hans van der Made, Eveline Jonkhoff, Tjeerd Stam, Marcel Bloemendal and Dimitri Frenken from the municipality of Amsterdam and Pieter Biemans, Robert Kint, Lucien Kuijsters and Yvanca Wensing from the municipality of Tilburg. Without their input, I would not have been able to develop such a thorough understanding of the municipalities and the developments of Zuidas, Buiksloterham, and Spoorzone.

I'm also indebted to good friends, Thijs van den Anker and Clare Barnes who were crucial to the development of my thinking on this topic through numerous conversations and especially providing key feedback at the 11th hour during the final revisions.

Lastly, and most importantly, I'd like to thank my girl friend and fiancée Marit Arkenbout, as well as our family for their patience and support while I embarked on this effort to redefine my professional career. I know it was not always easy to adjust to the patterns of a student again, dealing with the many long nights and weekends that it took to complete all the relevant coursework for this degree. Achieving this degree would not have been possible without their ongoing encouragement and support.

Jason Young
Utrecht, The Netherlands
December, 2011

Abstract

There is increasing interest in the academic literature regarding municipal level action for sustainable development and to address climate change. While the more comprehensive approach of Local Agenda 21 (LA21) received most of the attention during the 1990s, implementation of LA21 is not consistently addressed across nations. In the meantime, local climate policy has gained much attention during the 2000s, enabled by national Kyoto reduction targets and transnational networks. This evolution brings a trend away from comprehensive sustainability initiatives towards energy-focused and sector-based initiatives focusing on reducing the emissions of greenhouse gases. This research seeks to investigate to what extent comprehensive sustainability is being approached at the municipal level in the Netherlands and how those ambitions carry over to urban development projects. Amsterdam and Tilburg are identified as front-running cities and the projects of Zuidas (Amsterdam), Buiksloterham (Amsterdam), and Spoorzone (Tilburg) are analyzed to understand what modes of governing are used by the municipality to meet their municipal sustainability ambitions.

Key concepts: Comprehensive Sustainability Initiatives, Governance, Modes of Governing, Sustainable Urban Development

Table of Contents

Chapter 1: Introduction & Research Objectives	7
1.1 Introduction & Background	7
1.2 Problem Description	8
1.3 Research Objective	10
1.4 Elaboration of Research Questions	10
Chapter 2: Research Design.....	12
2.1 Analytical Framework.....	12
2.2 Research Material & Strategy.....	16
2.3 Case Study Selection	19
Chapter 3: Context for municipalities in the Netherlands	23
3.1 National funding mechanisms	23
3.2 The Climate Accord	24
3.3 Spatial planning in the Netherlands.....	25
Chapter 4: Amsterdam – Zuidas & Buiksloterham	30
4.1 Amsterdam’s municipal-level efforts towards sustainability.....	30
4.2 Zuidas: Creating a new and sustainable urban center in south Amsterdam.....	36
4.3 Buiksloterham: Redevelopment of the IJ riverbank in north Amsterdam	73
Chapter 5: Tilburg - Spoorzone	95
5.1 Tilburg’s municipal-level efforts towards sustainability	95
5.2 Case study: Spoorzone - Expanding the city center through Brownfield redevelopment	110
Chapter 6: Learning from front-running cities in the Netherlands.....	132
6.1 Amsterdam & Tilburg, striving for comprehensive approaches to sustainability?.....	132
6.2 Municipal influence & strategies for a comprehensive sustainability approach.....	134
6.3 Opportunities & barriers to a comprehensive sustainability approach.....	140
Chapter 7: Conclusions & Recommendations	144
7.1 Implementing a comprehensive approach to sustainability	144
7.2 Reflections on theory and literature	145
7.3 Reflecting on the research methodology	150
7.4 Recommendations for further research.....	151
Appendix: Summary of Governing Modes for each case study	166

List of Figures

1.1: Visualization of Research Objectives Questions, Methods.....	11
2.1: ICLEI interpretation of LA21.....	12
2.3: Visualization of research approach.....	17
4.1: Situation of Zuidas between Amsterdam’s city center and Schipol international airport...	37
4.2: Detailed overview of Zuidas developments	38
4.3: Example sustainability requirement	42
4.4: Planning maps for bike and pedestrian traffic	56
4.5: Impression of Zuidas ‘Dok model’	56
4.6: Amsterdam’s open water system.....	59
4.7: Pie graph showing breakdown of Amsterdam housing market	65
4.8: Bar chart showing Amsterdam’s residential energy label breakdown	66
4.9: Overview of developments in Amsterdam Noord	75
4.10: Sketch proposals from Buiksloterham sustainability tender	77
4.11: Example GPR output from Buiksloterham plot 41	79
5.1: Organization of Tilburg’s multi-actor network organization: Klimaatschap.....	98
5.2: Concept organizational model for the reorganization of the municipality of Tilburg	101
5.3: Comparison of Tilburg’s best and worst category diagrams for ecological capital	103
5.4: Tilburg’s remaining ecological capital category diagrams	104
5.5: Comparison Tilburg’s of best and worst category diagrams for social capital	105
5.6: Tilburg’s remaining social capital category diagrams	105
5.7: Comparison of Tilburg’s best and worst category diagrams for economic capital	106
5.8: Tilburg’s remaining economic capital category diagrams	107
5.9: Example output of GPR for a building project.....	108
5.10: Map of Spoorzone area	110
5.11: Bicycle and pedestrian traffic map provided in the Master Plan for ‘De Werkplaats’	119
5.12: Vehicle traffic route through ‘De Werkplaats’	120
5.13: Overview of green structure provided in the Master Plan for ‘De Werkplaats’	125

List of Tables

2.1: Comprehensive sustainability checklist.....	14
2.2: Modes of Urban Climate Governance	16
2.3: Top 10 Dutch municipalities per year according to the Sustainability Meter.....	20
2.4: Frontrunning Dutch Cities for Sustainability & Climate Change	20
2.5: Case study comparison.....	22
3.1: Compilation of BANS and SLOK/Klimaatakkord themes	24
4.1: Sustainability pillars with associated accountable department and Alderman	33
4.2: Summary of sustainability program ‘Amsterdam beslist duurzaam’	33
4.3: ZIPS design principles and area-wide strategies	42
4.4: Comparison of Zuidas & Buiksloterham	74
4.5: Tools used in Buiksloterham sustainability tender selection process	78
5.1: Tilburg-specific sustainability categories for measurement in the Telos method.....	102
6.1: Summary of case study evaluation results according to the comprehensive sustainability framework	132
7.1: Modes of governing for sustainability	146

Chapter 1: Introduction & Research Objectives

1.1 Introduction & Background

The world is continuing to urbanize. In 2009, the world's urban population moved beyond 50% of the total population for the first time in history. This percentage is only expected to grow, with the 2009 revision of the UN *World Urbanization Prospects* report (2010) predicting an 84% increase in urban population by 2050. Increasing rates of urbanization are brought on by a combination of industrialization and globalization leading to migration from rural to urban areas and population growth (United Nations, 2010). Increasing urbanization raises many issues in terms of urban sustainability, as it can lead to increased CO₂ emissions, air, noise and water pollution, alters land-use, degrades biodiversity, and causes urban heat islands, making urban areas hot spots driving global climate change and potentially degrading the overall quality of life of people living and working in cities (Grimm et al., 2008).

Since the Earth summit in Rio de Janeiro in 1992, cities have held a predominant role in the discourse of sustainability and climate change. Out of the Earth summit came Agenda 21, the document prescribing the 'global action plan' for sustainable development, with an entire chapter dedicated to local sustainability that immediately inspired a number of Local Agenda 21 (LA21) programs throughout the world. Opinions, however, differ regarding the appropriateness of dealing with issues such as climate change at a local level when environmental consequences can be transboundary in nature and thus begging international cooperation (see Evans et al, 2006; Wiener, 2007 for opposing perspectives).

In the absence of any global agreement including the world's largest carbon emitting nations, local initiatives have emerged to address the issues at hand through initiatives inspired by LA21 programs, or transnational networks such as Climate Alliance, Cities for Climate Protection (CCP), Energy Cities, and the C40 cities of the Clinton Climate Initiative (Betsill & Buckeley, 2007). The approach taken in these initiatives varies – some focusing specifically on climate change mitigation and adaptation while others choose a broader sustainability ambition. Sometimes, the former has led to the latter, or vice-versa. In either case, this research investigates how broadly a municipality can approach sustainability in their initiatives and tries to articulate the various roles that the municipality takes on in order to facilitate progress towards sustainability.

Sustainability is a broad concept that can be applied to many different systems – environmental, economic, social, urban, and so forth. Naturally, there are many perspectives on the concept of sustainability. Such concepts are normative, insofar as to deem something as sustainable is to identify a preferred state in comparison to something perceived as unsustainable (Du Pisani, 2006; Jordan, 2008; Sneddon et al., 2006). Research in these fields tries to better understand problems of unsustainability and provide insight into their causes and possible solutions.

Governance has become a central theme in research in sustainability, and while there is debate over the precise definition, the concept characterizes the patterns emerging from the governing process when relationships and responsibility are spread across state, market, and civil society actors in various forms of partnerships or networked relations (Jordan, 2008; Stoker, 1998). Governance is multi-level: vertically nested in a hierarchy, extending from local, to municipal, provincial/state, national and global levels; and horizontally, requiring coordination between institutions and where best practices are shared across transnational networks (Betsill & Bulkeley, 2006; Corfee-Morlot et al., 2009; Hooghe & Marks, 2003; Kern & Bulkeley, 2009).

This research project looks into the challenge of addressing sustainability at the municipal scale and in urban development projects. Urban developments are used in

order to investigate how well the municipal policy program has been implemented at the development level. In doing so, it will seek to better understand what aspects of sustainability can be furthered by the municipality and specifically investigate the role of the local authority in pursuing the implementation of the city's sustainability initiatives.

1.2 Problem Description

There is a substantial theoretical literature regarding sustainable urban development, its various themes (Wheeler & Beatley, 2009), the most appropriate urban forms (Jabereen, 2006) and governance for urban sustainability (Evans et al., 2006; van Bueren & ten Heuvelhof, 2005; Wheeler, 2000). While the motivation for city action is quite varied and diverse (see Sippel & Jensen, 2009), many cities have taken the initiative to create sustainability plans with the help of higher levels of government, for example through funding programs, or through their engagement with transnational networks (or both) (Gupta et al., 2007; Kern & Bulkeley, 2009). Each of these programs has their own guiding principles or requirements, tending to lead to municipal programs that differ in emphasis. Some, like those inspired by LA21 and the associated Aalborg Charter, are quite comprehensive and more focused on integration of sustainable development principles and themes while others such as those inspired by climate networks focus on the reduction of greenhouse gas emissions and energy initiatives in an effort to mitigate and adapt to climate change.

With or without LA21, cities all over the world are directly responding to the threat of climate change and working towards targets set in the Kyoto Protocol agreement (with and without national leadership). Accordingly, the last decade has witnessed a growing literature regarding local climate policy (Anguelovski & Carmin, 2011; Betsill & Bulkeley, 2007; Bulkeley, 2010 for recent literature reviews). Transnational networking has become an important facilitator of both LA21 initiatives (Evans & Theobald, 2003) and more focused climate action (Betsill & Bulkeley, 2004; Kern & Bulkeley, 2009).

The adoption of LA21 and the associated Aalborg Charter is quite varied across Europe (for examples, see Evans et al., 2006; Evans & Theobald, 2003; Jonas et al., 2004; Wild & Marshall, 1999). The Aalborg charter was adopted after the first European conference on Sustainable Cities and Towns in 1994. Ten years later at the 'Aalborg+ 10' conference, the 'Aalborg commitments' were created to renew efforts for the pursuit of local sustainability in 2004. Countries such as Austria, France, Germany, and the UK have between 40 and 100 cities as signatory parties to the Aalborg commitments; Italy and Spain have so many signatory parties (between 650 and 1200 respectively) that it seems disingenuous (Garcia-Sanchez & Prado-Lorenzo, 2008); whilst the Netherlands¹ is among a host of other countries with low adoption levels (under 20 cities), surprising considering the environmental reputation of countries such as the Netherlands, Denmark, Norway and Sweden (Aalborgplus10.dk, 2010).

The influence of LA21 and national policy in the Netherlands

For the Netherlands, its environmental and sustainable development policy maturity has perhaps limited the added value of LA21. Since 1989, national funding programs provided financial assistance to municipalities for environmental planning under the 'National Environmental Policy Plans' (NEPP), which are formulated every four years. Dutch interest in LA21 peaked in the late 1990s, during a period of national support for creating a municipal action plan for LA21 as one of nine policy programs in which

¹ The signatory parties from the Netherlands are: Amstelveen, Amsterdam, Boxtel, Breda, Breukelen, Den Haag, 's-Hertogenbosch, Rotterdam, Tilburg, Utrecht, and Vught. Dordrecht is listed as provisional signatory (aalborgplus10.dk, 2010).

municipalities could acquire national grant funds provided in the 'supplementary contribution scheme for developing municipal environmental policy' (abbreviated 'VOGM' in Dutch and in effect from 1996-1998) under the Ministry of Spatial Planning and the Environment (abbreviated 'VROM' in Dutch) (Coenen, 2001).

In 1999, a more focused effort on climate change led to the national agreement, '*Bestuursakkoord Nieuwe Stijl*' ('BANS') which provided national funds for local climate initiatives from 2002-2007. This program focused on seven themes: municipal buildings and installations; housing (new and existing); business (fixtures, fittings and business parks); agricultural sector; traffic and transport; sustainable energy; and international cooperation (Gupta et al., 2007). In comparison to the Aalborg Charter, these themes are much more practically focused and have a closer resemblance to initiatives of the C40 cities initiative – thus more sector-based than comprehensive. In 2008, a new program for stimulating local climate initiatives ('SLOK' in Dutch) succeeded the BANS funding scheme. More about these national funding programs will be discussed in Chapter 3.

The national sustainable development plan, in cooperation with the European Strategy for Sustainable Development, takes a more comprehensive approach to sustainability, however the stimulation of these initiatives to take place at the municipal level remains unclear (COM, 2009). The recently formed right-winged government of Mark Rutte brings additional uncertainty. The former ministry of the environment (VROM) has been merged with the Ministry of Transport, Public Works and Water Management to form the Ministry of Infrastructure and Environment and little has been published to give an indication of the national support for more comprehensive local sustainability for the coming years. This raises questions as to the extent to which comprehensive² sustainability is being addressed at the local level in the Netherlands, and whether the local authorities are making progress towards these strategies.

The influence and role of local authorities

Struggles with implementation are not only limited to comprehensive approaches to sustainability, as even with many front-running cities in climate policy, "their rhetoric is frequently not matched with resources" (Anguelovski & Carmin, 2011, p. 4) and some of the targets set are proving hard to achieve (Wheeler, 2008). Given this policy failure, scholars have been seeking out the obstacles standing in the way, pointing to lack of institutional capacity and political struggle at the municipal level, among other factors challenging implementation (Bulkeley, 2010; Sippel & Jensen, 2009).

Not only does this raise questions regarding how to get around these obstacles, but it also raises questions regarding which actors can actually influence measures that change outcomes. In the context of multi-level governance and market globalization, this influence is distributed both vertically and horizontally (Corfee-Morlot et al., 2009), leading to various actors looking for opportunities to apply their influence to either enable or hinder progress towards sustainability. This implies that while local authorities are taking the initiative to set targets and improve sustainability, their influence will

² The choice for the term 'comprehensive' as opposed to 'integrated' here is deliberate. Integration is about building interconnectedness between different principles and themes, whereas comprehensiveness is about the total breadth of the sustainability initiative. Both a climate-focused initiative and a comprehensive sustainability initiative could be evaluated for their integration within its program – looking for elements that build connections between themes and prevent siloed approaches to each sector. The focus of this research is on evaluating the comprehensiveness, or breadth, of the municipal policy initiatives. Integration is one component of the comprehensive approach.

often vary, creating the necessity to develop strategies to work with other actors to meet their goals. It is with this issue of local influence and implementation that this thesis will seek to make a contribution: providing insight to which strategies are being used by *local authorities* at the municipal level towards improving comprehensive sustainability initiatives.

Knowledge gap

As a result of the literature review, there seems to be two areas where this research can contribute. First, there is a lack of literature looking at cities taking on a comprehensive sustainability approach, apart from the literature directly addressing the implementation of LA21. Further, in the context of a comprehensive approach to sustainability, it remains unclear where local authorities have the most influence, and for areas of less direct influence, what strategies are best deployed in order to further the city's sustainability initiative. By contributing to these specific areas, this research provides valuable information to cities and actors of state, market and civil society organizations to help focus efforts at the municipal level not only on what can be achieved and which strategies are relevant, but also to set the right expectations of what can be accomplished at the municipal level in collaboration with approaches focused on other spatial scales.

1.3 Research Objective

By making an assessment of approaches taken by leading Dutch municipalities, the objectives of this research are three-fold:

1. To investigate the extent to which Dutch municipalities are striving for comprehensive approaches to sustainability
2. To articulate the local authority's role and strategy taken for the policy areas addressed in their initiative
3. To investigate the opportunities and barriers to implementing comprehensive sustainability initiatives at the municipal level

1.4 Elaboration of Research Questions

By addressing these objectives, the study aims to generate descriptive, explanatory and evaluative knowledge, by answering the following central research question and the three associated sub-questions:

Central research question: *To what extent are municipalities capable of implementing a comprehensive approach to sustainability and what factors account for this?*

Sub-questions:

1. To what extent are the cities selected in the case studies striving for comprehensive approaches to sustainability at the municipal-level? (Evaluative knowledge)
 - a. What is meant by a comprehensive approach to municipal-level sustainability initiatives? (Descriptive knowledge)
2. How does the role of the local authority influence a comprehensive sustainability approach at the municipal level? (Explanatory knowledge)
 - a. What role is the local authority taking to promote its sustainability agenda? (Descriptive knowledge)
 - b. Given the local authority's influence and role, what strategies are being used to make progress towards meeting the goals of its sustainability initiative? (Descriptive knowledge)
3. What are the opportunities and barriers to a comprehensive approach to sustainability at the municipal level? (Explanatory knowledge)

A visualization of how the central research question and sub-questions relate to the objectives and methods is provided below in Figure 1.1

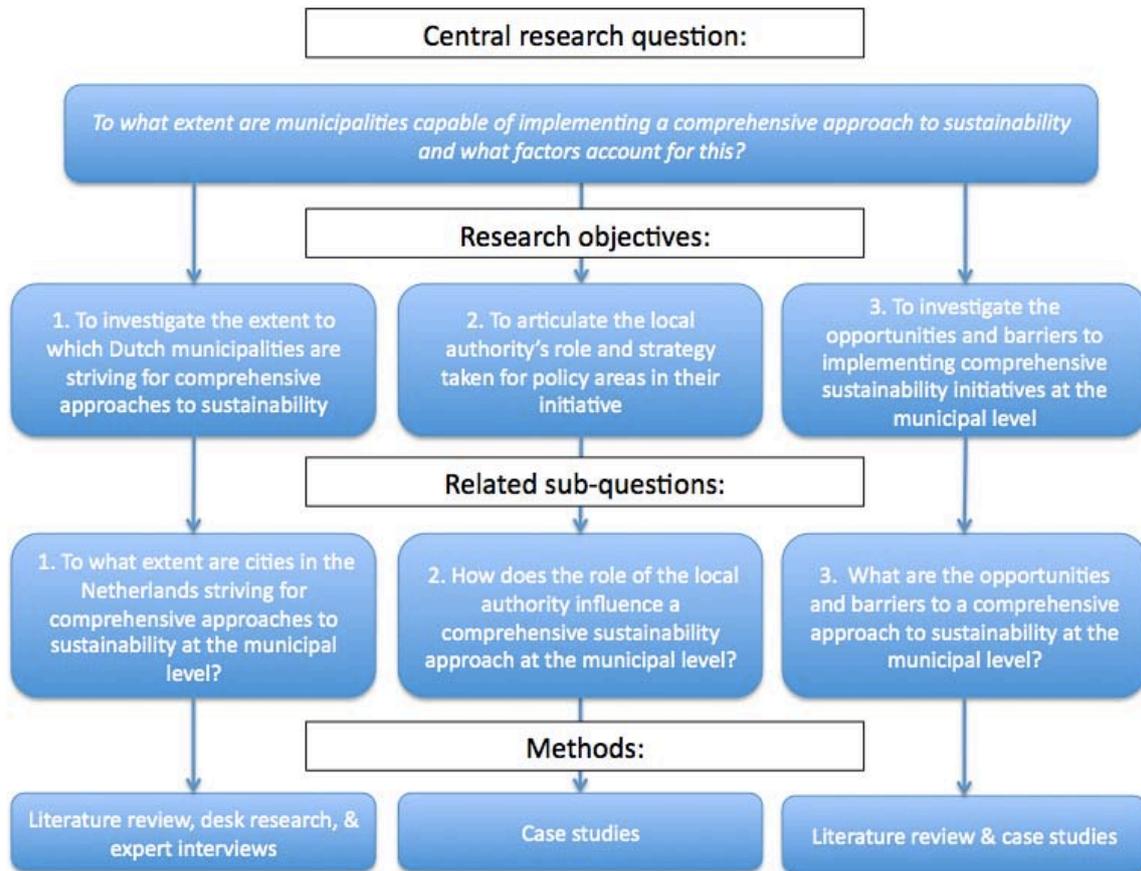


Figure 1.1: Visualization of Research Objectives, Questions, and Methods

Chapter 2: Research Design

2.1 Analytical Framework

For the purposes of this research, the analytical framework is composed of two parts:

- To analyze the comprehensiveness of a city's sustainability initiative (sub-question 1 in Chapter 1), a framework will be developed based on existing principles and themes found both in the literature and in practice
- To analyze the role of the local authority (sub-question 2a in Chapter 1), Bulkeley and Kern's (2006) typology of 'modes of governing' will be used

The other two sub-questions regarding identifying the municipal strategies for their sustainability initiatives (sub-question 2b) and the identification of opportunities and barriers (sub-question 3) and the central question regarding the municipal capability for using a comprehensive sustainability approach will be answered based upon the data generated from applying this analytical framework to the municipal case studies.

Comprehensive sustainability initiatives

Inspiration for comprehensive local sustainability initiatives can be found by turning towards the original output of the Rio Summit in 1992, Agenda 21. Agenda 21 provides four main dimensions of sustainable development *social, economic, environmental, and participatory action* (Evans & Theobald, 2003). To help cities through the process of creating their own Local Agenda 21 (LA21), the International Council for Local Environmental Initiatives (ICLEI) & the European Sustainable Cities and Towns Campaign developed a training program aimed at local authorities, further interpreting the content of Agenda 21 (Figure 2.1). Here, a couple of additional points are worth highlighting:

- An emphasis on the *integration* of both issues (economic, environmental, and social) and interests (inclusion of all groups in society)
- The *long-term character*, including consideration of the precautionary principle (ibid.)

According to ICLEI, a Local Agenda 21 is characterized by:

- The integration of issues: environmental objectives are linked with economic and social objectives
- The integration of interests: in a culture of dialogue and participation, all groups in society are to be involved
- Its long-term character: measures and projects are based on long-term objectives keyed to the precautionary principle
- Its global dimension: impacts of local action on global development are measured, ways of counteracting the global unequal distribution of consumption and wealth are identified. The local contribution to global sustainability is an explicit goal
- Sustainable management of resources: utilization of natural resources is based upon the rate at which new resources are formed; substance inputs into the natural regime are based on its capacity to degrade them (ICLEI, 1998).

Figure 2.1: ICLEI interpretation of LA21 (Source: quoted directly from Evans & Theobald, 2003: 782)

Up to this point, the principles remain quite high level, which prompted the development of the Aalborg Charter, the key output from the 1994 Sustainable Cities and Towns Conference in Aalborg, Denmark. These five basic concepts were developed into 13 guidelines for adopting a LA21. Of these guidelines, a few are worth highlighting as they bring in additional considerations for what it means to pursue sustainability:

- The importance of having a *local strategy* for sustainability, ensuring that measures are taken to incorporate sustainability principles into all relevant policies and practices
- *Social equity* highlights the need for citizens to be able to meet their 'basic needs', including water, food, housing, healthcare, education, and employment
- The role of *spatial planning* is emphasized (*land-use patterns*) to consider the sustainability of new developments
- *Urban mobility* places emphasis in transportation modes and problems of congestion
- Finally, the role of *instruments and tools* are highlighted for the ongoing measurement and management of progress towards sustainability

In the build up to the World Summit on Sustainable Development in Johannesburg (2002), the UN Environmental Programme (UNEP) & Environmental Protection Authority of Victoria facilitated an international 'charette' (collaborative design session) which resulted in the Melbourne Principles for Sustainable Cities (Newman & Jennings, 2008). This list of ten principles in many ways embodies the same principles of the Aalborg Charter above, with a few additional points of emphasis worth adding to this framework:

- Recognizing the *sense of place* and placing value on distinctive characteristics of cities, including their cultural and historical attributes.
- Fostering *cooperative networks* to engage other actors in reaching the goals of a sustainable future.
- Promotion of sustainable *production and consumption* by promoting environmentally/socially superior technologies and managing demand.
- Ensuring *accountability, transparency, and good governance*.

Sustainability initiatives will often include focused strategies which are more sector-based and found often as themes in funding initiatives (such as the Dutch BANS program), in practical programs promoted by C40 Cities (C40cities.org, 2011) or WWF's One Planet Living (Panda.org, 2011). Therefore several sector-based policy areas will be added to the framework to consider whether the city includes such strategies in their sustainability initiative:

- Energy efficiency, reduction, and renewable production
- Building retrofits for energy efficiency, production, green roofs, and water retention (for municipal, residential, or commercial properties)
- Waste reduction and reuse
- Water management and adaptation measures
- Local raw materials production/use
- Local and sustainable food production
- Health and wellness³

³ Health and wellness can have many determinants and a comprehensive study of health and wellness measures and their effectiveness is outside the scope of this research. Instead, attention is placed on those aspects of health and wellness that the municipality covers specifically in their sustainability and planning documents.

Lastly, returning to the literature, recent reviews on climate policy in particular suggest the importance of internal integration and coordination procedures to ensure collaboration and cooperation across various departments and city officials and also with between different levels. Further, institutionalization is necessary to avoid conflicts among political loyalties and time horizons – which means formalizing policies, dedicating staff, allocating budget, and so forth (Alber & Kern, 2008; Betsill, 2001; Bulkeley & Kern, 2006, Collier, 1997; Sippel & Jenssen, 2009).

Together, all of these criteria will serve as a checklist (Table 2.1 below) that will be used to evaluate the comprehensiveness of the program offered by the municipality and to consider what the local authority's strategy and role is for each item. This list is meant to be flexible, as it is more just a way of benchmarking the city's program and it is expected that there may be other interesting and creative initiatives taking place that are not included in this list. This list was validated and adjusted during expert interviews.

Criteria	Explanation	Inspiration
<u>Principles</u>		
Integration	The balancing of environmental, economic, and social objectives & interconnecting the different policy areas	Agenda 21
Long-term outlook	Intergenerational social, economic, and environmental equity	Agenda 21, Melbourne Principles
Participation	Formal processes and forums for engaging actors, including education, training, and access to information.	LA21, Aalborg Charter
Social Equity	Considers availability of 'basic needs' for all citizens: water, food, housing, healthcare, education, and employment	Aalborg Charter
<u>Procedures</u>		
Sustainability strategy	Create and document sustainability strategy and promote public engagement.	LA21 & Aalborg Charter
Institutionalization	Formalized policies, dedicated sustainability staff or office, integration and communication procedures, allocated budget.	Climate policy literature
Fostering partnerships & networks	Develop and enable multi-actor networks	Melbourne Principles
Instruments & tools	Develop indicators, dashboards, monitoring processes, conduct impact assessments, etc.	Aalborg Charter
<u>Policy Areas</u>		
Energy	Reduction/efficiency initiatives Renewable energy supply	SLOK/BANS, C40 cities, WWF OPL, SustainLane
Spatial/land-use planning	Planning of sustainability concepts in new developments, consideration of urban form, land distribution, zoning, and growth.	Aalborg Charter, SustainLane
Mobility & Transportation	Infrastructure for public transportation, biking, walking, congestion reducing strategies, planning for auto use.	Aalborg Charter, SustainLane
Biodiversity & Habitat	Preservation of existing green space, regeneration and development of eco-corridors for wildlife.	Melbourne Principles, WWF OPL
Water	Water use efficiency, recycling, pollution, sewage management, restoration of natural water cycles, and adaptation initiatives for flood control.	WWF OPL, C40 Cities, SustainLane
Waste	Reduction of waste, encouraging reuse, recycling, and composting; use waste for clean energy generation.	WWF OPL, C40 Cities

Criteria	Explanation	Inspiration
Building Retrofits	Energy efficiency measures, promotion of green roofs, and efficient water use, retention, and adaptation measures for water safety.	C40 Cities, SustainLane
Production & Consumption	Promoting environmentally/socially superior technologies (Fair trade and other labels); managing demand.	Melbourne Principles, WWF OPL
Food & Agriculture	Local and low impact food production, campaigns for sustainable diet.	WWF OPL, SustainLane
Cultural & Historical	Preserve and cultivate locally based cultural and historical characteristics, creating a sense of place.	Melbourne Principles, WWF OPL
Health & Wellness	Promotion of healthy lifestyles, physical/emotional well being, and community engagement.	WWF OPL

Table 2.1: Comprehensive sustainability checklist (developed for this research)

Assessing the role of the local authority

In order to assess the role of the local authority in urban climate governance, Bulkeley & Kern (2006) have developed a breakdown of various modes of governing that can be used in this research. According to their framework, there are four main categories of governing:

- 'Self-governing' – focuses on the authority's role as consumer and role model, taking direct action to improving energy-efficiency of municipal buildings and adopting procurement policies preferencing sustainable goods and services to demonstrate benefits for community;
- 'Governing through enabling' – focuses on the authority's role as a facilitator, including public education and awareness campaigns, promotional activities, the development of public-private partnerships and networks for the provision services and infrastructure, as well as financial incentives or subsidies encouraging action by other actors;
- 'Governing by provision' – focuses on the authority's role as a provider, possible when authority is a majority shareholder in utilities (energy, transport, water, waste, etc.), however due to increasing liberalization and privatization of utilities, this role is diminishing;
- 'Governing by authority' – focuses on the authority's role as regulator, most commonly through urban and spatial planning, but also examples of traffic congestion pricing, building standards for renovation or new developments, however authorities are generally reluctant to take authoritative action in the face of political opposition.

These modes are not meant to be mutually exclusive, as it is certainly possible that a combination of these modes may be engaged within a particular sustainability field at a given point in time. Alber & Kern (2008) provide an example of how this typology can be applied to the fields of energy, transport, waste, and spatial and land use planning (Table 2.2).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Energy			
Energy efficiency schemes and use of CHP within municipal buildings (e.g. schools) Procurement of energy-efficient appliances Purchasing of green energy Eco-house and renewable energy demonstration projects	Campaigns for energy efficiency Advice on energy efficiency to businesses and citizens Promotion of the use of renewable energy	Clean energy service provision Energy service companies Provision of incentives and grants for energy-efficiency measures	Strategic energy planning to enhance energy conservation Ordinances on the mandatory use of renewable energy Energy efficiency requirements in zoning ordinances
Transport			
Mobility management for employees Green fleets	Education campaigns Green travel plans Quality partnerships with public transport providers	Public transport service provision Provision of infrastructure for alternative forms of transport Logistics centres for goods transport	Transport planning to limit car use and provide walking and cycling infrastructure Workplace levies and road-user charging
Waste			
Waste prevention, recycling, and reuse within the local authority Procurement of recycled goods	Campaigns for reducing, reusing and recycling waste Promotion of the use of recycled products	Waste service provision Installations for recycling, composting and 'waste to energy' facilities Recycling, composting and reuse schemes	Regulations on methane combustion from landfill sites
Urban Planning and Land Use			
High energy-efficiency standards and use of CHP in new public buildings Demonstration projects – house or neighbourhood scale.	Guidance for architects and developers on energy efficiency and renewables		Strategic land use planning to enhance energy efficiency and the utilisations of renewables Planning of sites for renewable installations Strategic land-use planning to enhance public transport

Table 2.2: Modes of Urban Climate Governance (Alber & Kern, 2008)

This typology is used during the empirical analysis to categorize the initiative being taken at the local level across the continuum of sustainable policy fields. Previous research findings indicate that 'governing through enabling' is often the most common approach to stimulating climate action in the UK and Germany and suggest that this is likely throughout Europe (Buckeley & Kern, 2006). This hypothesis will be tested in this research for the case of the Netherlands and will be reflected upon in the concluding chapter.

2.2 Research Material & Strategy

Research Approach

The approach used for this research is outlined below in Figure 2.3. Following the diagram from left to right, the approach begins with desk research and expert interviews in order to define main concepts and the analytical framework used in this research (represented by the boxes in the second column). The concepts will be used to develop the criteria for making a selection of cases and will also be used together with the analytical framework to conduct the analysis. The case studies will look at the implementation of comprehensive sustainability initiatives. Since these initiatives by definition cross many policy areas, it is expected that the local authority will have varying levels of influence, requiring the local authority to play different strategic roles in meeting its objectives. The column to the right shows the expected results of the research.

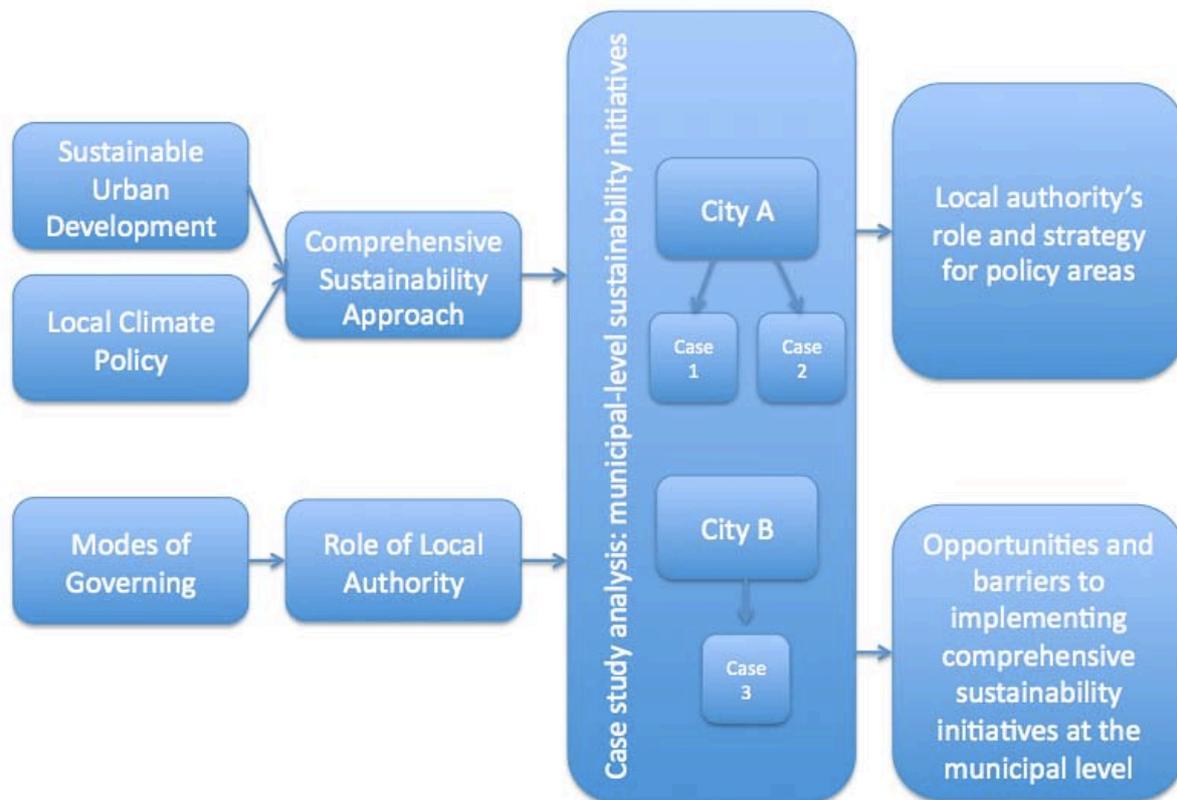


Figure 2.3: Visualization of research approach

Literature review and expert interviews

In this research, literature was studied to elaborate the concept of sustainable urban development and the different initiatives and content areas or themes that are covered within the field. The literature was consulted for international examples of sustainability initiatives and local climate policy, therefore allowing some comparisons between what is being done in the Netherlands with the broader international community. By looking at the literature and the practical examples that can be found therein, a comprehensive sustainability approach for the municipal level was defined and used to evaluate the content of the sustainability initiatives analyzed in the case studies.

In addition to looking into the literature, interviews were conducted with local experts in the Netherlands. These interviews were informative in nature and not structured for coded interpretation. Interviews in the first phase of the research helped to elaborate how much influence can be found within the local authorities and also to provide a more general understanding of the various roles that are being played by the municipalities. This served to validate and supplement what is found in the literature, in particular for its applicability to the Dutch context. During the same time period, the interviews and desk research were used to seek out the Dutch front-runners in terms of sustainability.

Interviews were also used to inform the case study analysis. Interviews were carried out at both the municipal and project levels in order to provide orientation to the municipal and project approaches and to validate the correct documents were consulted when doing the desk research. Upon completion of the analysis, a draft was sent via email to those interviewed for validation and feedback and this feedback was reincorporated into the analysis as necessary.

In-depth Case Study Analysis

The choice for a case-study approach is due to the practicality of wanting to go beyond theory and see to what extent theory matches reality. In this case, a narrow definition of the term case study is being used as provided by Seawright & Gerring (2008, p. 296): “the intensive (qualitative or quantitative) analysis of a single unit or a small number of units (the cases), where the researcher's goal is to understand a larger class of similar units (a population of cases).” The goal is to see what has been put into practice in cities that are approaching their sustainability initiative in a comprehensive way and to investigate the strategic behavior of the local authority in choosing its role and collaborating to meet its objectives. It is not expected that what works in one city will necessarily work in another due to structural and contextual differences, but that is further motivation for better understanding the opportunities and barriers for doing so.

Since the focus of this study is on municipal sustainability initiatives, it seems prudent to limit the variability at the higher geographic scales to better understand how cities differ in their approaches. As a result, the study will be confined to cases within the Netherlands. Municipal-level research will be conducted through interviews and extensive desk research that investigates municipal documents for sustainability or climate initiatives, spatial development plans, and environmental policies and programs.

In an effort to go beyond rhetoric and vision statements, the tested the implementation of these initiatives by analyzing urban development projects within the municipality. By focusing in on urban development projects it was possible to consider how well the municipality is able to put their sustainability plan into practice and integrate the strategy at the project scale. Therefore, once the cities had been selected, the next task was to identify leading urban development projects for analysis. This was done through interviews with municipal-level employees and through desk research and will be described in more detail in section 2.3 below.

Project-level analysis followed the same formula: a combination of interviews with project leaders and desk research were used to go over project-related documentation. It is important to note that this analysis did not study the sustainability *outcomes* found in the development. Urban development projects can be very long in duration, often lasting decades. An analysis of the sustainability performance would require a long-term study of the development – its status before the initiative and how the initiative resulted in a more sustainable urban development, with attention to each theme included in the program. Instead, the focus is more on the implementation of the municipality's sustainability program in terms of the content for the planning of the development and the role played by the municipality in assuring its realization.

It is at the project-level that the detailed evaluation took place. Each item on the comprehensive sustainability checklist (Table 2.1) was considered separately, looking for both project- and municipal-level documentation to provide a qualitative assessment of how well that item was addressed. A stoplight rating system was used – with green, yellow and red icons to indicate the extent to which the item was addressed in the particular project. Green items were well addressed, yellow items were only partially addressed, and red items were either minimally addressed or not addressed at all.

The evaluations within each case study were broken up into three parts according to the comprehensive sustainability checklist – principles, procedures, and policy areas. Each part would begin with a summary table of the stoplight ratings for each item in that category and then the items were presented according to their rating – green, yellow, and then red. The presentation included a detailed description of the information used to come up with the qualitative assessment. The evaluation of each item on the checklist concluded with a summary of the role that the municipality played according to the modes of governing framework – providing examples of self-governing, enabling,

provision, and authority when available. Upon completing the evaluations, these ratings were sent to the project-level contacts to see if any projects or initiatives had been missed in the rating, therefore helping to validate the results.

As a final contribution, the results of the case studies provided enough information to expand the table created by Alber and Kern (2008) to provide examples of how each governing mode is used for the additional policy areas identified in this research when expanding the table from a focus on climate initiatives to those included under comprehensive sustainability (see Table 7.1 in the concluding chapter).

2.3 Case Study Selection

For this research, the intention is to compare two frontrunning cities in terms of municipal sustainability programs in the Netherlands. In order to identify those cities a number of steps were taken. First, via the Internet, various ranking systems for sustainable, resilient, and green cities were reviewed for Dutch cities. While most of these types of rankings are limited to the United States, a few did have a more international or European focus, but the only Dutch city to be mentioned is Amsterdam.

Amsterdam made the Siemens and Economic Intelligence Unit's European Green Cities Index published in 2009, which evaluated 30 major European cities in terms of CO₂ emissions, energy, buildings, transport, water, waste and land-use, air quality, and environmental governance. Amsterdam placed 5th overall and received highest marks for water (1st), waste and land-use (1st), and transportation (2nd); scored in the top 10 for energy (5th), buildings (6th) and environmental governance (10th); and just outside the top 10 for air quality (11th) and CO₂ emissions (12th) (Economist Intelligence Unit, 2009).

Amsterdam also made honorable mention in Triple Pundit's Global Ranking of Top 10 Resilient Cities⁴, which evaluated "global cities with populations of 600,000 plus based on a range of factors including political commitment, density, transit access and use, renewable energy capacity, GHG emissions, GHG reduction targets, climate change mitigation and adaptation planning, and acreage of parks" (Cohen, 2011).

Nationally, the Sustainability Meter ('Duurzaamheidsmeter') has been a measurement tool used to rank the cities based on municipally submitted data in terms of sustainability, originally inspired by Local Agenda 21. The system is developed by COS Nederland and based on the 3 P's model of people, planet, and profit, each worth one third of the total score (COS Nederland, 2009). Table 2.3 below shows the results since 1999⁵.

⁴ Triple Pundit is a "new-media company for the business community that cultivates awareness and understanding of the triple bottom line" – essentially an online editorial site for sustainable business (Triplepundit.com, 2011).

⁵ The surveys from 2006-2008 were based on different criteria in order to conduct a national benchmarking survey for sustainable purchasing.

Sustainability Meter - Top 10 Municipalities per year							
	1999	2000	2001	2002	2003	2004/2005	2009
1	Rotterdam	Breda	Breda	Breda	Breda	Tilburg	Breda (1)
2	Nijmegen	Den Haag	Boxtel	Boxtel	Delft	Delft	Alkmaar (1)
3	Breda	Almere	Amersfoort	Zoetermeer	Eindhoven	Alkmaar	Nijmegen (3)
4	Groningen	Amersfoort	Wageningen	Leiden	Boxtel	Breda	Groningen (3)
5	Leeuwarden	Nijmegen	Oosterhout	Haarlem	Haarlem	Dordrecht	Tilburg (3)
6	Boxtel	Rotterdam	Zutphen	Ridderkerk	Tilburg	Apeldoorn	Amersfoort (3)
7	Tilburg	Apeldoorn	Nieuwegein	Bernheze	Groningen	Eindhoven	Apeldoorn
8	Amsterdam	Nieuwegein	Heerhugowaard	Nieuwegein	Oosterhout	Boxtel	Delft
9	Amstelveen	Tilburg	Leiden	Tilburg	Leiden (9) Renkum (9)	Hengelo	Waalwijk
10	Wageningen	Leiden	Leidschendam	Amersfoort	Zwolle (9)	Leeuwarden	Maastricht

Table 2.3: Top 10 Dutch municipalities per year according to the Sustainability Meter (COS Nederland, 2009)

The biggest critique on the rating is that it is based on self-reporting and the question lists are mostly binary, requiring a yes or no response (Schellekens, 2011; van Vliet, 2011). In the 2009 report, it was stated that the system is becoming increasingly difficult for larger cities to answer a simple yes or no to many of the questions, since the answers are more nuanced. This is the reason why Amsterdam has stopped participating in the survey (COS Nederland, 2009).

To supplement these ratings, a series of interviews were conducted with sustainability experts from the private sector, public agencies, and academia. In each interview, the interviewee was asked their opinion of the leading cities in terms of sustainability or climate change policy. Table 2.4 shows the cities mentioned in each interview with a comparison to the number of appearances the city turned up in the top 10 of the Sustainability Meter.

Frontrunning Dutch Cities for Sustainability and Climate Change																	
City	Tilburg	Apeldoorn	Venlo	Amsterdam	Groningen	Heerhugowaard	Rotterdam	Utrecht	Almere	Arnhem	Breda	Delft	Den Haag	Haarlemmermeer	Heerlen	Maastricht	Wageningen
Interview Mentions	4	3	3	2	2	2	2	2	1	1	1	1	1	1	1	1	1
Sust. Meter	6	3	0	1	3	1	2	0	1	0	7	3	1	0	0	1	2

Table 2.4: Frontrunning Dutch Cities for Sustainability and Climate Change

When comparing the interview results with those from the Sustainability Meter, a few cities stand out. The table is sorted from left to right based on the number of times the city was mentioned in the interviews. Tilburg, Apeldoorn, Groningen, and Rotterdam all show up in both lists multiple times. Breda is also highlighted, as it has appeared the most times in the Sustainability Meter compared to any other city (five times in the 1st position). However, it’s puzzling that only one of the interviewees mentioned Breda as a

leading city. Also of note, some cities did quite well in the Sustainability Meter, but were never mentioned in the interviews – Boxtel (5 appearances, twice in second position), Amersfoort (4 appearances, twice in third position), and Leiden (4 appearances). Tilburg, on the other hand, stands out as a city that has done well in both lists – it is mentioned most frequently in the interviews and it is the second most frequent city to appear in the Sustainability Meter's top 10.

With this information the two case studies can be selected. Due to its international reputation, Amsterdam is an interesting case study since it is the international frontrunner in the Netherlands. Additional desk research also reveals that Amsterdam has a significant volume of information regarding its sustainability program and that program is exceptionally comprehensive in nature. In addition, within Amsterdam there are a number of complex urban development projects to choose from – Zuidas, Ijburg, and Amsterdam Noord (along the IJ riverbank) (Gemeente Amsterdam, 2011j; van der Made, 2011).

Zuidas is a large mixed-use development in the area surrounding the Amsterdam Zuid train station and has national priority due to its attractiveness to international banks and corporations and strategic location between Amsterdam and Schipol International Airport. Ijburg is a series of islands in the eastern IJ River/IJ Lake that are being created for residential expansion. Both of these developments are cases where the municipality is highly involved in the development process and much of the build will be new. The third area is a former industrial area just north of the station along the IJ riverbank. In this area, there are multiple developments, however one in particular is interesting due to its market-based approach to development and a tender-process that was used to create market competition on sustainability, Buiksloterham. Therefore the choice will be made for Zuidas and Buiksloterham.

Based on the interviews and the results of the Sustainability Meter, Tilburg is the other stand out candidate. It provides an interesting comparison to Amsterdam for a number of reasons. First is its size and location, with just over 200,000 residents it is the 6th largest city in the Netherlands and will have different resource capacity than Amsterdam. Many more Dutch cities fall into the mid-size category (75,000-200,000 residents) and therefore would look to Tilburg as a model before they would compare themselves to a large city such as Amsterdam. Also, not being located within the Randstad region of the Netherlands, Tilburg will likely have less national attention, as the Randstad is the economic engine of the Netherlands. Lastly, based on the interviews and some additional desk research, Tilburg's program is largely based on Climate Change mitigation and adaptation and sustainability is only recently rising onto the municipal agenda. As more cities in the world are focusing on establishing climate program and CO2 reduction strategies, it will be interesting to see how far they can go towards a broader definition of sustainability.

Within Tilburg, there are not many examples of urban development projects that are complex and mixed-use in nature, as many of the developments outside the city center are more monofunctional, focused on residential, commercial, or industrial. The main exception is the Spoorzone project, which is a significant city center expansion project made possible by the relocation of a large rail yard that was located just north of the Tilburg train station. A summary table of the three case studies is provided below.

<u>Development</u>	<u>Size</u>	<u>Previous Use</u>	<u>New Use</u>	<u>Municipal-involvement</u>
Zuidas (Amsterdam South)	270 hectares	Commercial/educational/ green field	Mixed-use	High
Buiksloterham (Amsterdam North)	35 hectares active (total area 100 hectares)	Industrial/brown field	Mixed-use	Limited
Spoorzona (Tilburg)	65 hectares	Industrial/brown field	Mixed-use	High

Table 2.5: Case study comparison

As this chapter comes to a close a number of important aspects of the research have now been defined – the analytical framework, research design, and case study selection. However, before the case studies can begin, additional information is necessary regarding the context of these case studies. In the following chapter attention will be given to national context with particular attention on sustainability, climate change, and spatial development policies.

Chapter 3: Context for municipalities in the Netherlands

Before proceeding with the case studies, it's important to lay a context within which the municipality in the Netherlands operates in order to better understand the actions and ambitions of the municipalities. A brief introduction was given to the Dutch context in the opening chapter, introducing the National Environmental Policy Plans (NEPP), the funding programs of BANS and SLOK, the history of LA21 programs in the Netherlands, and the more recent political shift to the right at the national level. This chapter will expand upon that introduction by providing additional information on the funding programs, introducing the Dutch 'Climate Accords' (Klimaatakkord), and providing an overview of Dutch spatial planning processes, which will be useful in understanding the impact of spatial planning in the case studies that follow.

3.1 National funding mechanisms

National funding for issues related to sustainability and climate change go back to the mid-1980s, when the national government first offered subsidies for municipalities to develop integrated plans to implement legal environmental policy. The scope of the policy was limited mostly to improving a permit process that was designed to reduce problems of 'nuisance' stemming from noise, soil and air pollution. Later, with the publication of the Brundtland Report in 1987, the Netherlands responded by establishing the first NEPP, which laid out tasks for local authorities to meet a much broader ambition for sustainable development that included an obligation to meet environmental performance standards, develop energy efficiency plans and citizen communication strategies. The plan included subsidies for the local authorities to build their capacity to successfully implement these tasks (Hoppe & Coenen, 2011).

In 1993, these subsidy schemes were evaluated and it was determined that they were not very effective, leading the national government in the mid-1990s to establish a new subsidy program that, on the one hand, would allow more discretion for the local authority, but on the other hand would provide more attention to performance outcomes. Included in the criteria for the new (VOGM) subsidy, was the optional establishment of an LA21 program, as promoted by Agenda 21. This would be the last subsidy that pursued broadly defined sustainability, as subsequent programs, BANS (2004-2007) and later SLOK (2008 – present), have a more sectoral focus and align more directly with the climate problem (Hoppe & Coenen, 2011).

In terms of content, the key themes of both BANS and SLOK are shown below in Table 3.1. Both the BANS and the SLOK programs used the concept of a menu card in which the city could make a selection from the themes and state their ambition level – active, front-runner, or innovative – each level came with specified targets. The themes were generally selected due to the influence that the city has over these areas and their potential for reducing the city's impact on GHG emissions and Climate Change (Schellekens, 2011).

BANS themes:	SLOK & climate accord themes:
<ol style="list-style-type: none"> 1. Municipal buildings & installations 2. Housing (new and existing) 3. Business (fixtures, fittings, & business parks) 4. Agricultural industry 5. Transportation 6. Sustainable energy 7. International cooperation 	<ol style="list-style-type: none"> 1. Municipal government operations 2. The built environment 3. (Agri-) business 4. Clean and sustainable transportation 5. Sustainable Energy

Table 3.1: Compilation of BANS (Gupta et al., 2007) and SLOK/Klimaatakkoord themes (Agentschap NL, 2010)

In the case of BANS, 200 municipalities made use of the funding (amounting to €30 million in total), which was in the form of a subsidy funding up to 50% of the city's climate proposal (amount per municipality was capped based on population/area of the city). The funds were not to be spent directly on the technology, but rather on the personnel, communication, and consultancy services associated with implementing the proposal. These efforts were to be monitored by an accountant and reported back to the national government, creating accountability in how the money was spent (Schellekens, 2011).

Contrary to BANS, the SLOK program was framed as a stimulus instead of a subsidy and was meant to support the municipalities in their efforts towards realizing the program set forth in the climate accords. The funds (initially €35 million, later expanded to €47 million) were distributed through the municipal fund, which is essentially a lump sum provided by the national government to the municipality to pay for monthly activities. 330 municipalities have qualified for the stimulus, which for most municipalities pays for roughly a 0.5 full-time employee that would spend its time implementing the climate proposal. However, the monitoring and accountability requirements were relaxed with SLOK, making it harder to trace how well money was being spent (Schellekens, 2011). The effect of this stimulus varies based on the size of the municipality – as many of the larger municipalities have more resources to allocate to sustainability or climate-themed initiatives. For small-mid-sized municipalities, this stimulus may be the only thing making it possible for the allocation of resources towards these initiatives (Van Vliet, 2011).

As of this research, all funds for the SLOK subsidy have been allocated and funds will start to expire in 2012. This presents questions regarding the future of national funding support for the sustainability or climate-focused initiatives of the municipalities. Already with the implementation of SLOK, the national government was restructuring its financial support for such programs in an effort to make municipalities less dependent on their support. In the 8-year time period covering both the BANS and the SLOK program, 425 municipalities have developed policies geared in some way towards reducing their climate impact (Schellekens, 2011).

3.2 The Climate Accord

To further stimulate municipal efforts to reduce their impact on the climate, in 2007, the association of Dutch municipalities (VNG) and the national government signed an accord to meet ambitions regarding sustainable purchasing, sustainable energy, and climate neutral building:

- Municipalities will strive for 75% sustainable purchasing in 2010 and 100% in 2015
- The national government and the municipalities will strive towards raising sustainable energy to a 20% share of the market in 2020 by doubling the wind energy market by 2011 and through the stimulation of biogas
- The national government and the municipalities will strive towards climate neutral building being the standard in 2020, requiring a 50% reduction in energy use
- Biofuels need to be more available along the highways and within municipalities

In order to help facilitate these goals, the national government has provided the SLOK subsidy, discussed above. In addition, five climate themes have been established and teams have been formed consisting of an alderman from a leading city on that theme, representatives from other leading cities, and a secretary. Each team put together their key focus points, an action plan, and established regional networks for knowledge sharing. Regional networks included the addition of market parties and non-government organizations. The five themes are the same as those listed in Table 3.1 above under SLOK (Duurzameoverheden.nl, 2011).

3.3 Spatial planning in the Netherlands

The Dutch are internationally recognized for their spatial planning due to its policies for compact urban growth and strong participatory processes resulting in consensus-based decision-making (the 'polder model'). Perhaps its efforts in urban planning came out of pure necessity, as the Netherlands is one of the most densely populated countries in the world with a population density of 466 inhabitants/km² in the year 2000 and home to 16 million people, 13 million pigs, 4 million cattle, and 100 million chickens all on 33,885km². Even with its high population density, only 14% of the land is for urban use, while 70% is devoted to agriculture (the rest allocated to protected park land and non-urbanized living and industrial use) (van der Valk, 2002). The result is a planning system characterized by "strong government intervention in the land market" (van den Brink et al., 2006, p. 150). This section will proceed by first giving some insight into the spatial planning process in the Netherlands, and then moving on to discuss the Dutch practices of urban concentration and consensus-based planning.

Planning processes

To gain further insight into the Dutch spatial planning system, it helps to understand the political system. The Dutch political system includes many political parties that must form coalitions in order to gain enough votes to gain control of government. As a result, radical changes that might otherwise flow when shifting from one political view to another are largely avoided. Further, there are three main levels of government with a national government, containing 12 provinces and 500+ municipalities. While all levels are theoretically autonomous, certain statutory powers are reserved for provincial and national levels. Contrary to the tax model in the US, local taxes make up a significantly smaller portion of the municipal budget, giving the national government considerable control over the finances of the municipality. The national government is responsible for providing 85% of total municipal income – 30% of which is a block grant and the remaining 55% is provided through special grants for housing, environment, conservation, and infrastructure (van der Valk, 2002).

All three levels of government have spatial planning powers. The national and provincial governments are responsible for creating guidelines or high-level framework plans for spatial development ('structuurvisie' or structural vision), while the municipal governments make structural visions and detailed land-use plans ('bestemmingsplan'), the latter of which is legally binding. Development planning can vary to a certain extent between cities and also between projects within a city, however these standard planning tools exist to help guide the overall process.

Structural visions have become a requirement for the state, provinces, and municipalities as of the new Spatial Planning Act of 2008. Seen as a way to create a more proactive planning tool, a structural vision should integrate the region's spatial development ambitions with issues such as environmental quality, water management, and economic development (Busck et al., 2008). At the city-level, structural visions can be made for the city as a whole or additional structural visions can be produced at smaller scales, such as found in Tilburg Noordoost (northeast) – an important expansion area for the city of Tilburg where the city created a separate vision to cover all of the related projects in that region of the city (Gemeente Tilburg, 2010b). In either case, the visions are often cast over 20-30 year period, which coincides with the duration of large-scale developments such as Amsterdam's Zuidas or Tilburg's Spoorzone projects.

The land-use plan can either be detailed or general and often lays out which activities are permitted on the land (residential, commercial, industrial, mixed-use), how the land is to be used (where the buildings should be placed), and the form of the buildings (height, breadth, density, etc.) The land-use plan may cover the whole city region or may just cover a specific development area that required when an exception to the city land-use plan is needed for development to be pursued (to allow flexibility). If a general plan is laid out at the city-level, detailed land-use plans are then required for specific developments (Needham, 2007). Even with the new structural vision documents being required for the municipality, the land-use plan remains the most important planning document at the municipal level, as inconsistency with the land-use plan remains one of the only ways for a building permit to be rejected for planning reasons (van Buuren et al., 2009).

Of particular relevance to this research, some cities have gone further than these standard documents to document a formal sustainability program or climate action plan at the city level. Historically, many Dutch cities have a history of addressing sustainability in varying degrees, some of which have been working on issues related to sustainability for more than 20 years. Such processes are purely voluntary initiatives and are often a result of participation in international or national networks (Clinton Climate Initiative's C40 cities or the Dutch Klimaatverbond) or participation in a national subsidy or stimulus program (such as Dutch BANS or SLOK funding). Both cities chosen in this research have such a program, the details of which will be covered in the case study.

Finally, at the scale of area development, important planning documents include the land-use plan, the master plan, project visioning documents, investment decision declaration ('investeringsbesluit'), building requirements ('bouwvelop'), and environmental assessment report ('milieu effect rapport' or MER). In the case where changes to the land-use plan are necessary before proceeding with planned development, a new land-use plan may be proposed for the area to be developed. Master plans and project visioning documents are optional and depend on the development. In some cases, all that is produced is the land-use plan and perhaps additional documentation detailing more specific building requirements.

Urban concentration

Urban concentration has been a key aspect of Dutch spatial planning, and especially for the Randstad, since the 1970s. The Randstad is a horseshoe shaped ring of old cities and new towns in the western part of the Netherlands of approximately 80km² containing the four largest cities (Amsterdam, Rotterdam, The Hague, and Utrecht) and home to 6.5 of its 16 million residents. At the center of the Randstad is the 'Green Heart', devoted mostly to agricultural activity, but also including natural areas for recreation. A key goal of the urban concentration strategy was to allow growth without urbanizing the 'Green Heart', essentially avoiding urban sprawl by allowing 'deconcentrated concentration'. Later, as urban decline started to emerge in the old urban centers, the goals shifted and the compact city policy emerged with more of an emphasis on urban renewal of

brownfield sites and greenfields adjacent to urban centers to avoid decline (Dielman et al., 1999).

The literature on compact urban growth has a mixed opinion as to the benefits. Two key benefits are to prevent deconcentration and urban sprawl and the potential for energy savings as a result of a reduction in automobile use, since the compact nature of the city makes it easier to promote walking, biking, and to provide efficient public transportation. Dielman, Dijst, & Spit (1999) took on these two issues in their review of the compact city policy's effects on the Randstad and found the first to be true, that a compact city policy had controlled growth and prevented the 'Green Heart' from becoming urbanized. Mobility, on the other hand, is more complicated and it was found that the Netherlands' use of public transportation was no better than other Western European countries that did not have such a compact growth policy and that the compact city policy couldn't be credited for the higher percentages of walking or cycling (ibid.)

Geurs and van Wee (2006) on the other hand, came to a slightly different conclusion. Their critique on previous studies is that conclusions were made without taking into account what the growth patterns would have been without the intervention. Modeling for the effects of the compact city policy in the Netherlands from 1970 to 2000, their conclusion is that the Netherlands policy significantly slowed urban sprawl, car use would've been higher at the cost of alternative transportation modes, accordingly, emissions would've been higher and there would've been more wildlife and ecological fragmentation (ibid.)

Not addressed in the studies on the Netherlands is the affect of compact urban form on the ability to provide municipal infrastructure, including energy, transportation, water, and waste systems. The assertion is that high population densities in compact cities require less physical infrastructure per capita than for areas with lower density and extensive sprawl and therefore the cost of providing and maintaining that infrastructure is more efficiently spent when the density is higher. Not surprisingly, the situation is a bit more complicated than it may seem and key determinants of cost efficiency must include existing infrastructural capacity and land-use conditions (ecological, geological) in the assessment. The basic idea is that infrastructure with available capacity can handle additional density/use for a substantially lower cost than if it required major infrastructural investment. Also, different ecological and geological characteristics can make the cost of providing infrastructure vary at a local scale, regardless of density (Biermann, 2000). Interestingly, in one study looking at this issue in the context of the UK, the cost of infrastructure provision was considered to be a non-issue for local authorities, since they pass most of the costs over to the developers in return for the land development rights (Williams, 2000).

While the affects of the Dutch compact city policies are clearly nuanced, knowledge regarding its implementation and the perceived affects provide valuable insight into understanding sustainable urban development in the Dutch context. As some aspects of sustainability can be improved by improving the sustainability of these infrastructural systems, the urban density resulting from urban concentration policies will play a role in the eventual feasibility of those upgrades.

Consensus-based planning

The other defining characteristic of the Dutch spatial planning system is that of consensus-based decision-making that has led to both formal and informal participatory processes for stakeholder engagement. In municipal land-use planning, key opportunities for participation occur in the plan forming stages. Public consultation is standard practice in processes for developing land-use plans, investment decisions, and reacting to environmental assessments (MER), which provide opportunities for other government organizations, non-profits, businesses and citizens to provide feedback and

suggestions. Of course there may be varying commitment to participation across different actors in the process (project managers, government officials, interest groups and citizens), however Woltjer (2009, p. 154) maintains a positive perspective when referring to consensus and stakeholder engagement in Dutch planning:

“Consensus-oriented approaches have contributed to a well-established system of public participation and consultation. Planners in the Netherlands spend a considerable amount of their time in formal and informal consultation meetings with institutionalised interest groups and government agencies...All government levels have competencies that are related to the justifiable concerns of stakeholders and that are appropriate for addressing at that level.”

Not everyone, however, is as positive about the Dutch system for participatory engagement. Hajer & Zonneveld (2000) question the system’s legitimacy and effectiveness, citing a lack of financial resources and legal power, leading to an over-reliance on discursive means of consultation and negotiation. While consultation and negotiation are not necessarily bad things, the authors state that public consultation is only opened up after consensus has been achieved internally, creating resistance to changing plans as a result of consultation. Therefore, they call for

“(...) a new generation of intermediary practices that do not only allow for the public to have its say (as in the participatory practices) but approach the variety of ‘stakeholders’ as knowledgeable actors in the plan making process” (p. 350).

Wolsink (2003, p. 718) shares this dissatisfaction with the current practice of consultation, seeing it as a deficiency in participatory processes:

“In the Netherlands, the formal institutions only support participation at the level of informing and consultation [‘degrees of tokenism’ (Arnstein, 1969)], and the practices emerging from these institutions have merely become ‘ritual dances’ and ‘window-dressing participation’, without affecting policy or decisions (Edelenbos, 2000)” (citations in original).

Further, discussing the consensus aspect, he states:

“Whereas the Dutch planning system enjoys an image of a system that involves a significant amount of collaborative planning, in practice that process is mainly limited to consensus building between governmental agencies and authorities on various levels” (Wolsink, 2003, p. 719).

It is not the intent of this research to engage the debate as to what extent participation processes are in fact legitimate and effective, as a detailed analysis of the participatory processes in each project is outside the scope of this research. Instead, this research will look to identify whether the municipalities directly encourage participation within their development projects, and if so, what forums have been available. In the evaluation of participation, the highest rating will be reserved for those efforts that go beyond participation after the fact, and rather offer opportunities for participation in the plan formation.

Bringing this chapter to a close, it’s important to reflect on how the context shapes the understanding of the case studies. The national-level provides a context with which the municipalities form and implement their sustainability ambitions. This context has evolved from earlier funding programs based on LA21 criteria to a now more climate-focused approach based on the BANS and SLOK funding schemes and the Climate Accord. This means that municipalities with ambitions for broader and more comprehensive sustainability initiatives are going beyond what is encouraged at the national level.

These municipal ambitions can be implemented through policies and projects of spatial planning. Urban concentration and consensus building characterize the spatial planning system in the Netherlands. Urban concentration presents opportunities for many urban forms and practices that are considered sustainable and urban (re)development creates an opportunity to stimulate their incorporation into the urban landscape. This makes the Netherlands an interesting context for the study of sustainable urban development.

Chapter 4: Amsterdam – Zuidas & Buiksloterham

With more than 750,000 residents (CBS Statline, 2010), Amsterdam is the largest city and capital of the Netherlands. Within Europe, Amsterdam is strategically important for its airport, harbor, and service-based industries. There is very little available space in the city center for development, causing most development projects to either consist of urban redevelopment or urban expansion, which over the years has also led to substantial growth to the surrounding municipalities and newer cities in the greater Amsterdam metropolitan area such as Almere, Haarlemmermeer, and Pummerend. The broader Amsterdam region is host to 31 municipalities and 2.2 million inhabitants, making it competitive with other European cities such as Barcelona, Copenhagen, Hamburg, Milan, Munich, and Stockholm (Janssen-Jansen, 2011).

The focus of this study is less on the Amsterdam metropolitan area, but rather on the municipality of Amsterdam. Amsterdam is a particularly good example of a welfare regime with a focus on reducing inequality. Within the municipality, 80% of the land is publicly owned and over 50% of the housing in the center is for social housing. Long-term land leases are common, known as 'Erfpacht', and gives the municipality a strong position in both housing and business development investments. The biggest challenge for the future is how to manage growth when so little space remains (Janssen-Jansen, 2011). Urban intensification and restructuring are the key strategies for doing so, and accordingly the urban development case studies of Zuidas and Buiksloterham illustrate different approaches for meeting growth needs while also striving towards ambitions as a sustainable top location for businesses and residents alike.

The following chapter will proceed as follows. First, an overview will be given of activities related to sustainability at the municipal-level. This will set the context for both Amsterdam case studies. Following the municipal context will be the detailed case studies, starting off with an introduction to the development and then a detailed analysis according to the analytical framework laid out in Chapter 2.

4.1 Amsterdam's municipal-level efforts towards sustainability

Amsterdam is also a good example of comprehensive sustainable city initiatives. The municipality has described its vision for sustainability in the document 'Amsterdam Uitgesproken Duurzaam', roughly translated as: 'Amsterdam pronounced sustainable' (Vos, 2010). The vision is the result of the interdepartmental joint workgroup on sustainability⁶ and sketches an integrated and sustainable state for Amsterdam in the year 2040, complementing the structural spatial development vision (Structuurvisie) for the city of Amsterdam in 2040 (Gemeente Amsterdam, 2011j). The lead author of the vision is Marijke Vos, a member of the Dutch Green party (Groen Links) and former Amsterdam city council representative for the environment (Wethouder Milieu). Since June 7, 2011, she is a member of the Dutch Senate (Eerste Kamer).

The vision is laid out in three main themes:

- Living in the compact city, which is sustainably built, livable, and integrating green space and water;

⁶ The workgroup consisted of representation from the department of environment and building construction (DMB), department of social development (DMO), the municipal development company (OGA), the bureau of engineering (IBA), department of spatial planning (DRO), department of transportation and shipping infrastructure (DIVV), department of economic affairs (EZ), project management bureau (PMB), and the program bureaus for climate and air quality.

- Sustainability transition, focusing on energy, material cycles, and mobility;
- Sustainable, innovative economy, using the people as the driving force for achieving sustainability

Within these three themes, intermittent steps are identified to realize the intended sustainable state in 2040, covering building conversion, densification, green space and biodiversity, water retention, energy production and efficiency, cradle-to-cradle material cycles, consumption of locally produced goods and food, stimulation of meat-reduced diet, increased bicycle and electric-powered transportation. The vision also frames the development of areas such as Zuidas, Schipol airport, and the Amsterdam harbor as world leading areas in sustainability. Further there is a focus on the creation of an open and innovative culture for sustainable businesses. In sum, the vision reflects a comprehensive understanding of sustainability.

Having a comprehensive vision on sustainability is an important step towards moving towards more sustainable cities (as recommended by LA21 and the associated Aalborg charter). However, a vision in itself is only a first step and the implementation of such a plan can be much more challenging than getting the right ideas on paper. Here, how the city moves to institutionalize its program becomes important. In order to aid the implementation of their sustainability vision, the city has two institutions which support this vision – the city's climate program and its new sustainability program, both of which are organized under the department of spatial planning (Dienst Ruimtelijke Ontwikkeling, DRO).

Climate program

Amsterdam was not the first large city in the Netherlands to dedicate resources to a climate program, as Rotterdam's participation in the Clinton Climate Initiative's C40 conference led to the 'Rotterdam Climate Initiative'. In May, 2007, Rotterdam set a goal of reducing 50% of CO₂ emissions by 2025 in comparison to 1990 levels and a budget of €50 million over three years ("Rotterdam wil CO₂ uitstoot halveren," 2007). Following Rotterdam's lead, the city of Amsterdam's Mayor and Aldermen agreed in June of 2007 on a goal of reducing CO₂ emissions by 40% in 2025, compared to levels in 1990.

As a result of this goal, the municipal department of the environment and buildings works (Dienst Milieu en Bouwtoezicht, DMB) started to develop a climate program that was to be operational by the end of 2007. Led by Gerrit Jolink, with a background in air quality management, the program started out small, with a budget of €1 million in 2008 and a climate bureau composed of 3-4 individuals focusing on measuring CO₂ emissions and the development of a strategy and program to address reductions (Nieuwamsterdamsklimaat.nl, 2007).

At its peak, the organization has been up to 25 individuals (some only part-time), enabling the program to implement its own projects, however with recent budget cutbacks it is presently between 10-15 individuals working on the program directly. With fewer resources, the focus has shifted to improving efficiency of the bureau – from a strategy of stimulating many small initiatives to focusing on a few key projects with large potential for impact and spending more time providing consulting/advice for the initiatives of other department's projects (Stam, 2011).

In 2010, a key accomplishment for the climate bureau was the publishing of its energy strategy for 2040, sketching a vision for the future and creating a transition plan on the built environment, traffic and transportation, harbor and industry, and sustainable energy. The strategy includes the ambitious goals of making a 40% CO₂ reduction by 2025 and striving for 75% reduction by 2040 (in comparison to 1990 CO₂ levels). Additional goals for the built environment include improving the standard of existing buildings to energy label B and new buildings to climate neutrality. Key goals for mobility

are to continue to reduce the use of personal automobiles in the city, to promote electric vehicles, and to move towards a roadway tax based on kilometers driven. For the harbor and industry, the goal is to turn the harbor into a 'green energy port' with substantial wind energy production, solar panels, and more attention to cradle-to-cradle principles in industrial production processes and use of biofuel alternatives. Finally, additional sustainable energy goals are for the large-scale production of solar energy, smarter energy networks, and large-scale implementation of geothermal heating and district heating solutions. While the plan sketches a long-term strategy, goals are set for three time periods – to 2015, 2015-2025, and 2025-2040 (Gemeente Amsterdam, 2010c).

Also in 2010, after the departure of Marijke Vos the climate program was moved from the department of environment and building works (Dienst Milieu en Bouwdienst, DMB) to the department of spatial planning and development (Dienst Ruimtelijke Ontwikkeling, DRO), becoming the responsibility of Alderman Maarten van Poelgeest, also from the Dutch Green Party (Groen Links). This move also included a special project fund of €60 million for use towards implementing the energy strategy formed in 2010 (Spier, 2010). According to Tjeerd Stam, employee of the climate office, the move to DRO has been positive. By being part of the spatial planning office, the climate agenda is better able to penetrate more directly with urban and economic development projects of the city. In this way, climate's influence on development is often perceived as positive change rather than so-called 'restrictive green initiatives' of the environmental department, which tends to have more of a 'bad cop' reputation of enforcing regulations and policies which limit the other departments (Stam, 2011).

One key project is the proposal for the development of a revolving investment fund for climate related investments which has been made possible by the city selling its stake in energy company Nuon for €800 million. The first step towards making this proposal a reality is securing the funds for the purposes of the climate program, which is at this time still uncertain as other municipal projects are in competition for the funds, such as the over-budget north/south metro line as well as proposals to pay down the city's outstanding financial debt. The goal is to establish a revolving fund of €150 million – allocating €60 million for sustainable energy, €60 million for innovation, and €30 million for infrastructure and building investments. It is important that this fund function in a revolving fashion, it cannot just subsidize the cost of energy-efficient or renewable energy installations, but must have the potential for a return on the investment in order to not deplete the fund (hence revolving) (Stam, 2011).

The climate office is also responsible for developing a monitoring strategy for climate-related indicators for the city as a whole. Given the amount of resources available to put towards monitoring, the focus is on relatively simple indicators such as annual energy consumption aggregated at the geographical-level of the city, as opposed to the monitoring of individual projects, developments or even the municipal organization's energy program. Alliander, the company providing the energy distribution network for the city, provides data for the energy metrics (Stam, 2011). Other indicators are being developed in cooperation with the city's new sustainability program, to be discussed below.

Sustainability program

Moving from the long-term visioning process to a formal program for sustainability in the near-term is a new endeavor for the municipality of Amsterdam. For the first time beginning in 2011, there is a detailed program outlined with specific goals for projects and associated monitoring, which has been approved by the Mayor and Alderman of Amsterdam. Upon approval, a program manager, Eveline Jonkhoff, was identified and two additional resources are dedicated to helping her coordinate the sustainability program (Jonkhoff, 2011). The program is titled 'Amsterdam chooses sustainable' (Amsterdam Beslist Duurzaam) and is made up of four key pillars: climate and energy,

sustainable accessibility and air quality, sustainable innovative economy, and materials and consumption. While all pillars have goals that will require cooperation across municipal departments and external organizations, to create accountability for the realization of the program, each pillar has been assigned to a municipal department with a responsible Alderman to coordinate and be responsible for the implementation (see table 4.1 below) (Gemeente Amsterdam, 2011a).

<u>Pillar</u>	<u>Department</u>	<u>Alderman</u>
Climate & energy	Spatial planning (DRO)	van Poelgeest (Green party - GroenLinks)
Sustainable accessibility & air quality	Infrastructure, traffic, and transportation (DIVV)	Wiebes (Liberal party - VVD)
Sustainable innovative economy	Economic affairs (EZ)	Gehrels (Labor party - PVDA)
Materials and consumption	Environment and building works (DMB)	van Poelgeest (Green party - GroenLinks)

Table 4.1: Sustainability pillars with associated accountable department and Alderman

Within each pillar, key action areas have been identified and monitoring goals established (see Table 4.2 below). The metrics are stated in general terms, with some being more easily quantified and others being more qualitative in nature. In particular, metrics for climate and energy as well as those from sustainable accessibility and air quality lend themselves more towards quantifiable indicators (Gemeente Amsterdam, 2011a).

Pillar	Action areas	Metrics/Goals
Climate & energy	Energy efficiency in existing buildings	Stabilization of CO ₂ emissions from small and large users
	Climate-neutral new build	Agreements made with housing corporations to set goals for efficiency label improvements
	Sustainable electricity	All areas in development have energy vision
	Sustainable heating and cooling	20,000 additional homes connected to district heating network
	Electric mobility	Stabilization of kilometers driven within the city
Sustainable accessibility and air quality	Cycling	Reduction of annual CO ₂ emissions per kilometer traveled
	Public transportation	Dramatic reduction of municipal auto fleet's NO ₂ and CO ₂ emissions
	Air quality	By 2015, air quality meets European standards for air-borne particulate matter and

		NO ₂
Sustainable innovative economy	<p>Strengthening national and international investment climate</p> <p>Promotion of sustainable business climate</p> <p>Sustainable finance</p> <p>Strengthening innovation</p>	<p>Significant increase in international companies</p> <p>Significant increase in sustainable SMEs</p>
Materials and consumption	<p>Effective use of raw materials</p> <p>The vital city</p> <p>Sustainable purchasing</p>	<p>Realization of several pilots for effective raw materials use (C2C)</p> <p>Increase in amount of separation of household waste for recycling and reduction of non-recyclable waste</p> <p>Reduction of environmental impact – air, noise, safety, soil</p> <p>Increase in healthy neighborhoods (GGD indicator)</p> <p>95% municipal purchasing is sustainable by 2014</p>

Table 4.2: Summary of sustainability program 'Amsterdam beslist duurzaam' (Gemeente Amsterdam, 2011a)

In addition to having a coordinating department and Alderman per pillar, there are more aspects of this program that make it interesting from an organization perspective. A key stakeholder group has been established, with representatives from additional municipal departments and external organizations such as the water utility (Waternet), the waste energy company (AEB), and the Amsterdam harbor. This group does not formally hold regular meetings but rather provides a network of contacts that can be pulled together ad hoc for making strategies, providing feedback and dealing with integration issues. Topic-specific working groups are also formed when needed to provide more in depth analysis or strategies for topics such as closing loops (C2C), developing the monitoring program, or developing a strategy for improving the sustainability of existing buildings (Jonkhoff, 2011).

As this program is at the beginning stages, a more specific list of projects or metrics has not been finalized at the time of this research. Preliminary meetings with the Aldermen and coordinating departments have been positive. Projects have been identified per pillar and additional attention has been spent on projects that cross pillars and focus on themes such as innovation, closing loops, and sustainable procurement. The result of this work will be a sustainability matrix that will document the identified projects and the pillars affected. Also, the aforementioned working group regarding monitoring has been established with the task of developing a sustainability index for the city to track its progress. Preliminary versions of this index have been shared with the Aldermen and coordinating departments and feedback has been positive. In short, the index is to be made up of 10 indicators in total each weighted 10%: two general indicators tracking CO₂ and NO₂ levels and then two additional indicators for each of the four pillars. The next step in the process is to have the index approved by the city council, after which it

can become public. The target is to begin publishing this index in the next year's annual report (Jonkhoff, 2011).

Sustainability reporting

While the sustainability program mentioned above is quite new, sustainability reporting has been a practice of the municipality since the first published report in 2006 (Gemeente Amsterdam, 2006). From the beginning, the city pursued its reporting according to the international standards of the Amsterdam-based Global Reporting Initiative (GRI). The first report laid out the city's vision and strategy on sustainability and made an inventory of existing projects, policies, and activities with sustainability ambitions. The idea was that the first report would also be a baseline for comparison in future years. Each report is an impressive document where many projects are showcased, putting Amsterdam's ambitions for sustainability on display in a transparent way. It serves as a valuable document for the public to see what is being done in the city, however the rigorous standards of the Global Reporting Initiative (GRI) make for a challenging project to put the report together (Frederiks, 2011).

Already in the first version, the dilemma of what to report in the annual sustainability report versus reporting elsewhere was discussed (Gemeente Amsterdam, 2006). For every year that the report was produced, the final product was between 70 and 100 pages and the 2007 report was even fully translated into English. Years 2008 and 2009 were combined in one report, and ultimately, the city has chosen to integrate its sustainability report into the city's annual financial report, which can be seen in the latest version reporting on the year 2010. The effect of integrating has reduced the sustainability section down to 7 dedicated pages, however sustainability themed information can be found in other sections of the 600+ page annual report (Gemeente Amsterdam, 2011g).

A 7-page summary seems more accessible for those who want to see an update on the city's efforts in an efficient manner, while those interested in more detail will need to search for additional information throughout the report or published elsewhere. This transition towards integrating sustainability into the annual financial report is consistent with GRI's goals of developing an integrated reporting standard for businesses and other public and private organizations. It is desired that reporting be consolidated to show that both fiscal and sustainability related disclosures are thought through in an integrated way and not by siloed departments producing separate reports for separate audiences. In order to make this transition in a transparent way that ensures high quality reporting, GRI has formed an 'International Integrated Reporting Committee' to establish a globally accepted framework, "bringing together financial, environmental, social, and governance information in a clear, concise, consistent and comparable format" (Globalreporting.org, 2011). Of course the only fear is that reporting is lost in the attempt to consolidate. This could be avoided if the city's programs for climate and sustainability continue to produce their own annual progress reports in relation to the program goals that have been set.

Amsterdam's involvement in municipal networks

The municipality of Amsterdam is a member of several national and international networks for either sustainability or climate change: Klimaatverbond, Energy Cities (through association with Klimaatverbond), ICLEI Local Governments for Sustainability, C40 Cities, and the EU Covenant of Mayors. That being said, the impact of these memberships is hard to determine and there is virtually no mention of these networks in the policy documentation reviewed for this case study. From a general perspective, membership has advantages from a reputation standpoint as their involvement in these networks helps position Amsterdam as a global frontrunner in sustainability and climate change. On the other hand, the main drivers for setting sustainability and climate goals stems more from national goals and international market competition than as a result of

any individual network. Within the Netherlands, Amsterdam finds few similarities in terms of size and scale (perhaps Rotterdam is the exception) and sees limited benefits stemming from extensive network interaction. Other Dutch cities are also less interested in Amsterdam due to their inability to match the scale and resources that Amsterdam can provide (Schellekens, 2011; van Vliet, 2011).

Sustainability in Amsterdam Area Development: Introducing the Case Study Analysis

The sustainability program for the municipality of Amsterdam is clear and ambitious, it's institutionalized through the climate office and the new sustainability program, there is an emphasis on networking/partnerships, and simple tools to monitor its progress are in development. While this is important progress, most of these initiatives are focused on specific sectors of sustainability (for example promoting electric cars, green roofs, thermal heating and cooling, district heating, or the conversion of waste into energy) and not necessarily on the integration across sectors. In order to better investigate how city's ambitions are implemented in an integrated way, area development will be investigated to see if these strategies are integrated at a smaller geographic scale. For the purposes of this analysis, an in-depth study was conducted on two development projects within the city of Amsterdam. The projects selected are the Zuidas development, situated in the south of the city in the area surrounding Amsterdam Zuid station, and the Buiksloterham development, which is a part of Amsterdam North across the IJ from the Hout harbor.

4.2 Zuidas: Creating a new and sustainable urban center in south Amsterdam

The Zuidas ('South Axis') is not only one of the most important development projects for Amsterdam, but also for the Netherlands. As a prime location lying on both sides of the southern ring highway between Schiphol airport and the city of Amsterdam, it is considered by some to be Amsterdam's 'golden mile' for commercial development (Majoor, 2008). This has implications for not only Amsterdam's but also the Netherlands' economic development and attractiveness, as European cities are increasingly in competition for international investment (Lever, 1999). The vision for Zuidas has long been to develop the area into a top European commercial business district – competitive in Europe with London's Canary Wharf or Paris' La Defense and attractive for international companies dealing in finance, consulting, and law (Gemeente Amsterdam, 2007). The ambition for the development of Zuidas, however, is not only to develop this area for commercial purposes, but rather to develop into a mixed-use area that can become and a new urban center in Amsterdam (Majoor, 2008).

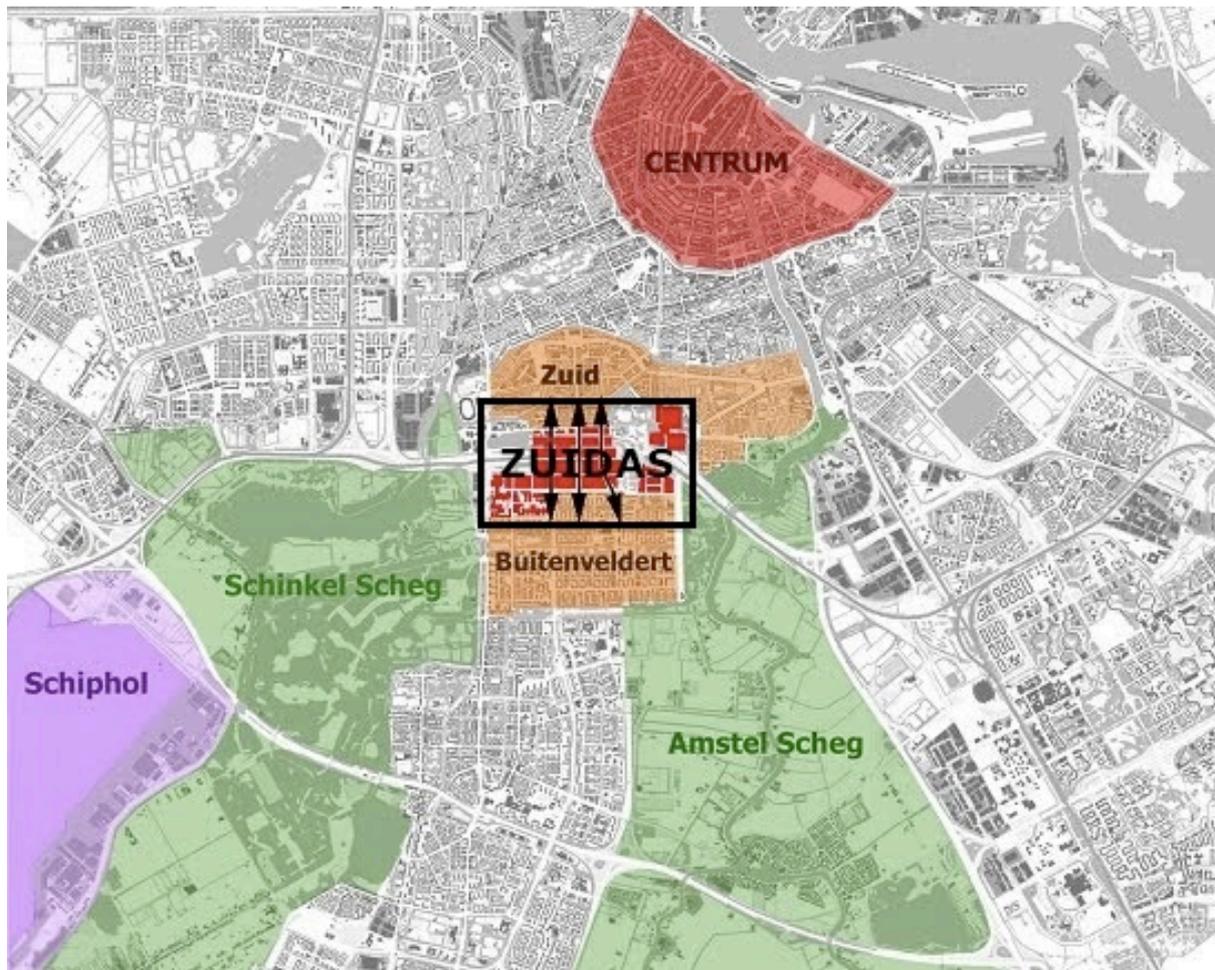


Figure 4.1: Situation of Zuidas between Amsterdam's city center (Centrum) and Schiphol international airport (Image source (annotated by author):Vervoersplanoloog.blogspot.com, 2011)

The 270-hectare Zuidas development is by far the largest development included in this research and is made up of several developments, each with their own character and profile. These developments includes space for the Amsterdam world trade center (WTC), international corporations (Mahler4), the Free University and medical center (VU Kenniskwartier), the RAI conference center, as well as balanced mixed-use developments (Beethoven, Kop Zuidas, Ravel), primary commercial areas (Fred. Roekestraat, Strawinsky, Vivaldi), and residential space (Dokzone, Gershwin) (Zuidas.nl, 2011). The various developments can be seen on the detailed map provided in Figure 4.2 below.



Figure 4.2: Detailed overview of Zuidas developments (Image source: Zuidas.nl, 2011)

At the time of this study, the different developments in Zuidas are in varying states of development. However at the highest level, the planning for the complete development of Zuidas is divided into four phases and extends beyond 2030. The four phases include a pre-dock phase until 2012, the development of the dock in the center of Zuidas to join the northern and southern areas from 2012-2018, and starting around 2018 after the major infrastructure is in place is the natural development that follows from having a more integrated and better connected area. The final phase is the complete city center of Zuidas, however no real end date is planned as the area will always be developing and redeveloping itself as any dynamic urban center usually does (Gemeente Amsterdam, 2009e).

The Zuidas development was initiated in the mid-nineties and the development plans continue in the recently released structural plan for 2040 (Gemeente Amsterdam, 2011j). In addition to the aforementioned structural plan, the city of Amsterdam has also released a sustainability plan for the Zuidas development (Gemeente Amsterdam, 2008) and a subsequent sustainability progress report for 2009 (Frederiks & van Eijk, 2010). Also in 2010, an energy vision was created for Zuidas (Frederiks, 2010). From these reports, it is clear that the Zuidas location has advantages in terms of sustainability – the development is intensifying existing urban development (as opposed to new greenfield development) and it's centered on a key public transportation hub (making it amenable to more sustainable forms of transportation). Additional opportunities emerge if the so-called 'Dokmodel' is realized. This plan is to route the transportation infrastructure underground and developing the space above the infrastructure in order to unite what is now a divided terrain. Additional benefits of such a model would improve the environment by reducing noise and air pollution. Further, the vision for the new Zuidas city-center as cast by both the municipal and national government is to have the Zuidas among the top-ten most sustainable city-centers in Europe by 2030 (Gemeente Amsterdam, 2008).

The case study that follows will start with an overview of the progression of Zuidas' sustainability approach. This will include summarizing the evolution of sustainability as presented in the Zuidas vision documents. Ultimately, this will lead to the detailed sustainability plan for Zuidas published in 2008. Since having such a detailed plan for sustainability at the area-development level is unique in this research, more detail will be shared regarding its contents. This discussion will lay the context for the development-level analysis, which will be an evaluation of the Zuidas development in terms of the comprehensive sustainability framework developed in this research. The analysis will also draw attention to the role that the municipality plays in stimulating

sustainable outcomes in each of the sustainability related policy areas. Here, the framework developed by Bulkeley & Kern (2006) will be used to structure the analysis.

Sustainability planning and progress

Given its strategic importance, the Zuidas development has its own department within the municipality and its own sustainability-dedicated staff. As a result, there is considerable documentation for both planning and sustainability to review for this research. Key planning documents for the Zuidas development are the Master Plan and the visioning documents that followed every 2-3 years. For longer projects such as Zuidas where implementation may take 30 years, regular visioning provides an opportunity to report on the status of development and to reassess the ambitions and priorities set in the original master plan of previous vision documents. This keeps the process flexible and adaptable as priorities change (van der Made, 2011). By reviewing these documents over time, it can be seen that sustainability has become increasingly important throughout the project's planning and implementation process, ultimately leading to a progressive sustainability plan in 2008. Unfortunately, also 2008 proved to be a turning point for the economy. The effects of the financial crisis still persist throughout the Netherlands, resulting in reductions of governmental spending, an oversupply of commercial space, and less new construction. As a result, the approach to sustainability in Zuidas is changing and uncertain (van Eijk, 2011).

The original Master Plan for Zuidas developed in 1998 was modest in its sustainability ambitions, primarily dealing with economic development and achieving a high standard of livability for the residents and those working in Zuidas. Environmental issues were placed in this context with emphasis on minimizing air and noise pollution and improving accessibility. In the closing years of the 1990s, the Zuidas development, and especially the development of high-speed rail infrastructure at Amsterdam Zuid station, was selected by the National ministry of transport, public works and water management (Verkeer en Waterstaat - V&W) as a 'new key development project' (Nieuw Sleutelproject - NSP). An NSP project meant not only increasing priority for the area's development at the highest authority level, but it also led to national influence on the framing of Zuidas by the infrastructure development visions of the national ministry of transport (V&W) and the environmental ambitions of the ministry of spatial planning and the environment (VROM) (Majoer, 2008).

In 2001, VROM released its fourth environmental policy program (NMP4), which put particular emphasis on responding to climate change and improving sustainability (MilieuFocus, 2008). Zuidas vision documents created in 2001 and 2004 also expanded the municipality's framing of sustainability, demonstrating its compliance with NMP4 and emphasizing sustainability as the fifth of six key ambitions of the project - outstanding accessibility, mixed-use, high density, high quality of public space, sustainability and flexibility, and social safety and good management. Of particular emphasis in the 2004 vision were the benefits of densification, mixed-use, flexible use (adaptability of buildings to be used for different purposes), material selection, energy efficient design and sustainable energy production as well as an increasing awareness for the importance of cooperation between public and private parties for the realization of these goals (Gemeente Amsterdam, 2004).

The increasing emphasis on sustainability continued with both the revised vision for Zuidas in 2007 (Gemeente Amsterdam, 2007) and the first published sustainability plan in 2008 (Gemeente Amsterdam, 2008). In the 2007 vision, the sustainability took on a central position in the ambition of becoming a top location for international corporate investment: "a sustainable and successful leading urban environment, with international allure, with the qualities of Amsterdam" (Gemeente Amsterdam, 2007: 23 - self-translation). Also, a more detailed discussion of sustainability included a further categorization of sustainable development as follows:

- Energy and CO₂
- Health and Wellness
- Diversity and social responsibility
- Materials
- Waste
- Traffic and mobility
- Microclimate⁷
- Ecology and landscape (including water)

Attention was also given to the management of the development as a whole. It is here that the ambition to use internationally accepted standards such as LEED for building evaluation, ISO 14001 for the organization of Zuidas Amsterdam, and GRI as a reporting standard for annual disclosure. Reporting would consider how the organization is managing six key areas for sustainability:

- Transportation and mobility management
- Park/area management – to include delivery of utilities, waste, energy, ecological quality, and public space
- Water management
- Construction management
- Economic management
- Social management

In 2009, the vision from 2007 was expanded to include a small addition to the implementation section. In particular, more information is given about the layout of the streets - including the street hierarchy and room for public transportation, bikes, and sidewalks, as well as the continuity of the street front properties - the building sites, public squares, green space and water. The emphasis in the new section is on the flexibility that is necessary in such a long-term plan. Guidelines are set forth for the development, however the detailed specifications will be filled in over time. The next full revision of the vision document will come in 2012 (Gemeente Amsterdam, 2009e).

The Zuidas sustainability plan

The Zuidas sustainability plan (Gemeente Amsterdam, 2008) is essentially a more detailed implementation plan of the sustainability items found in the 2007-vision document. It was created in cooperation with sustainability-oriented architecture and design firm Arup, which is the lead architecture firm providing oversight for the overall development project. The report is framed using the Brundtland definition of sustainable development – "...development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations World Commission on Environment and Development (WCED), 1987) - and the 'Cradle-to-cradle' design principles of William McDonough and Michael Braungart as it's basis: eco-effectiveness, elimination of the concept of waste, waste = food (McDonough & Braungart, 2002). In doing so, the plan takes a broad approach to sustainability encompassing the preservation of the natural environment, focusing on material cycles where possible and minimizing use of nonrenewable resources and materials, supporting social development with health and wellness, creating equitable opportunities, promoting active and stronger communities, and achieving economic growth.

⁷ Microclimate includes promoting the positive effects of sunlight, clean air, and green space while limiting the negative effects of wind, rain, urban heat (UHI), air pollution, noise, and climate change

The Zuidas sustainability plan makes an effort to layout its goals in relation to its context, thereby stating its alignment with national and international ambitions set in the National Environmental Policy Plan (NMP4), the Kyoto Protocol, and the EU Sustainable Development Strategy (Gemeente Amsterdam, 2008).

The plan specifies the following sustainability goals, which were decided upon by the mayor and lawmakers on March 4, 2008 (Gemeente Amsterdam, 2008):

- To come as close to CO₂ neutral as possible
- To use highest international sustainability criteria for all development from 2012 and onwards (for example, LEED or BREEAM certifications and other accepted norms)
- Achieve a 20% reduction of parking spaces - 10% between 2008 & 2018 and 10% between 2018 & 2028 (without causing parking problems)

Additional goals for Zuidas were sited as in line with the national environmental plan (NMP4):

- Contribute to a healthy and safe living environment
- Create a clean and attractive living environment
- Provide for a balance of supply and demand of renewable resources
- Use non-renewable resources as little as possible

To ensure progress towards these goals, the sustainability plan goes into great detail to set requirements across the sustainability categories laid out in the vision from 2007: energy & CO₂, health and wellness, diversity and social responsibility, material use, waste, transportation and mobility, microclimate, and ecology and landscape. The amount of requirements per category varies (from 5-11) and total to 60 requirements. Each requirement is presented with a table that shows which parties take a role in its achievement – government, the Zuidas Amsterdam organization⁸, and market parties. The role is differentiated between identifying the party responsible for guaranteeing it's achievement ('borging'), by for example implementing a regulation or taking on a new practice, versus the parties helping to stimulate it's achievement ('inspanning') (Gemeente Amsterdam, 2008 see example requirement table in Figure 4.3 below). This is an important distinction; the government holds the only legal authority to make regulations for the project, however it is much preferred from a political standpoint that the city maintain more of an inspiration and facilitation role as opposed to authoritarian. Therefore, several examples exist where there is no party guaranteeing the requirement, however it is hoped that the requirement is achieved through mutual agreements from the various parties involved in the realization of the project (van Eijk, 2011).

After the requirements, the sustainability plan lays out an implementation plan that relied on the eventual creation of a public-private organization for Zuidas Amsterdam that would be separate from the municipality itself. This organization could then take the lead to coordinate the implementation of the plan in coordination with the municipality and other parties such as local businesses vested in Zuidas, such as ABN Amro, as well as non-profit organizations such as the Dutch Green Building Council. In addition, Zuidas Amsterdam would produce an annual sustainability report according to the guidelines of the Global Reporting Initiative (GRI), to follow up on the progress of the sustainability plan (Zuidas Amsterdam, 2008).

⁸ In 2008 the municipality was pursuing establishing Zuidas Amsterdam as a public-private organization. Since this time, the concept has not been brought to fruition and Zuidas Amsterdam remains a department within the municipality of Amsterdam (van Eijk, 2011).

Eisen per aandachtsgebied, energie en CO2 –uitstoot

1. In Zuidas wordt de CO2-uitstoot verminderd met 40 procent in 2025 ten opzichte van 1990

In de praktijk is dat een reductie van 60 procent. Zuidas past daarmee in het Amsterdamse beleid. Behalve een investering zal er zo ook een forse kostenbesparing worden gerealiseerd. Het betreft hier wel het energieverbruik dat is gekoppeld aan de gebouwen en niet aan de mobiliteit

Actor	Borging	Inspanning	Opmerkingen
Overheid	X	X	Geborgd in Amsterdams beleid, extra inspanningen gemeente
ZA		X	extra inspanningen
Markt		X	extra inspanningen



Figure 4.3: Example sustainability requirement (Gemeente Amsterdam, 2008, p. 14)

Ultimately, the public-private organization never got off the ground due to a lack of interest to invest by private parties (in part, driven by the financial crisis) and the responsibility of the coordination of the plan was left to the municipality (van Eijk, 2011). The 2009 annual sustainability report came out in 2010 as planned, and while the vision and ambition for achieving sustainability in Zuidas remained, the report did not follow up directly on the requirements as laid out in the 2008 sustainability plan. Instead, the report focused (briefly) on the different development projects located throughout the greater Zuidas area (including Ravel, Beethoven, VU Knowledge Quarter, Dokzone, Kop Zuidas, Vivaldi, Gershwin, and Mahler) as well as stated a general list of sustainability outcomes (9 in total) (Frederiks & van Eijk, 2010). In retrospect, the monitoring proved harder to accomplish than stated in the sustainability plan and it would’ve taken too much time and resources to go back through all of the requirements that were outlined in the sustainability plan (van Eijk, 2011).

Zuidas Integrated Placemaking Strategy (ZIPS)

Another key strategy document is the Zuidas Integrated Placemaking Strategy (ZIPS) (Gemeente Amsterdam, 2011k). This planning document has been created to guide the planning and development process to goals realizable in the near term (2015). Presented in this document are a set of design principles and a set of area-wide strategies that should be considered in the development (see Table 4.3 below).

Design Principles	Area-wide Strategies
A part of Amsterdam, a part of the world	Integration with the city
Experience completeness in all phases	City structure
Integrated planning and design	Public space / open domain
Sustainable, flexible and adaptable	Layout and positioning
Complexity with integrity	Mobility and accessibility
Spatial hierarchy, the street as a place	Cables and utility infrastructure
Programmable spaces	Food

Existing principles: strengthened and redefined	Art and culture
Responsibility for performance	Ground use
	Climate change and sustainability
	Information technology

Table 4.3: ZIPS design principles and area-wide strategies (Gemeente Amsterdam, 2011k - self-translation)

Of additional relevance to this research, the area-wide strategy for climate change and sustainability gives specific attention to the following eight categories:

- Energy & CO₂
- Mobility
- Climate
- Wellness
- Materials
- Society
- Biodiversity
- Economy

ZIPS was developed in coordination with lead architecture and planning firm, Arup. Key to the planning strategy for Zuidas is to recognize the area’s complexity and stimulate diversity (both in the sense of people and functions/uses). It is recognized that diversity is not necessarily something that can be planned explicitly, but rather the result of responding to the chances and opportunities that present themselves. From a spatial planning perspective, this means being responsive and maintaining a broad perspective of the identity of Zuidas and cultivating development that promotes its characteristics (through material choice, functions, and forms) (Gemeente Amsterdam, 2011k).

Responsiveness is to be balanced with more detailed planning for the landscape, green space, water, and transportation all wrapped up in a spatial hierarchy that guides the form of the development. The street, public squares, and parks are defined as main public spaces for activity and interaction but there is also consideration for new forms of public space such as building atriums and rooftops. Building guidelines are defined in ZIPS in order to influence the overall form and scale of development. For example, ZIPS outlines restrictions on building heights at specific locations: street-level (10 meters), middle-sized (30 meters) and towers (up to 105 meters). By doing so, the city achieves leverage in the placement of specific types of buildings and maintains influence with the market parties on the overall appearance and urban form (Gemeente Amsterdam, 2011k).

This document is not intended to be fully prescriptive in content, but rather should be perceived as more of a process to help guide planning and design to meet the identified principles. It doesn’t necessarily mean that every project will contribute directly to every principle, but rather that this tool be reviewed with the developing parties to select key focus areas for the project. The document is relatively new, however its strength is that it builds on much of the sustainability-related efforts developed for Zuidas, but turns it into more of a tool for short-term decision-making. While its too early to tell how effective it will be, those interviewed found that it was much more usable in comparison to the overwhelming amount of requirements that came out of the first sustainability plan (van Eijk, 2011).

This brief history on the Zuidas development reveals that sustainability has been receiving increasing attention from a planning perspective. In the section that follows,

the approach taken in Zuidas will be analyzed using the lenses of the comprehensive sustainability framework and Bulkeley & Kern's framework for assessing the governing modes, both outlined in the framework chapter of this research.

Development-level Analysis Zuidas

Of the three developments analyzed in this research, the Zuidas development is the largest and receives the most attention from a planning perspective. That is not to say that it has achieved the most sustainable outcomes or the dynamic city-center environment that has been envisioned for its development. Rather, it means that the municipality has engaged in a significant effort to define and refine its vision for the development as an effort to improve Amsterdam's position among world cities attracting multi-national corporations and investment (Gemeente Amsterdam, 2009e).

It is important to keep in perspective that the vision is for the long-term, making a sketch of what the city hopes to accomplish by developing the Zuidas in 2040. Currently, a short walk through the area will reveal an area that has considerable work ahead if it is to live up to the ambitions laid out for its development. In its current state, a sphere of commerce brought on by the large office buildings dominates the areas immediately north and south of the station. While there are cafes along the ground level of these buildings en route to the station, they tend to cater mostly to the formally dressed occupants of the office buildings above. The train station remains the main link to connect north and south sides of the development and no physical work has begun on the 'Dok model' to bring the infrastructure underground. Beyond the high-density commercial space in the middle of the Zuidas, the area to the south first transitions across vacant commercial property before joining what appears to be aging residential and light-commercial space to the south. To the north, a walking pedestrian crosses under an elevated tramline before entering into another aging, albeit more attractive, residential area to the north. In either case, these areas will need to be transformed in order to achieve the vibrant and dynamic vision that the city is hoping for.

Some areas within the Zuidas are further along than others, Ravel, the university quarter (Kennis Kwartier) and Kop Zuidas are proceeding through the necessary planning processes and begin development, but even in those areas the realization of the complete plans are years away. Therefore, the focus of this analysis is not on the project's success in achieving sustainable outcomes, but rather on the potential for those outcomes to occur, by analyzing the planning processes and initiatives that are in place that attempt to influence and promote the creation of a more sustainable Zuidas.

Principles

Development principles give insight to the key values of the project. As the largest development project in Amsterdam, the municipality has committed significant resources to planning for the development and documenting its intentions. For the Zuidas project, much can be learned about these intentions by reading the visioning documents as well as other planning documents such as the city's structural vision, the Zuidas sustainability plan, annual sustainability reports, and the ZIPS planning strategy. Zuidas scores well in the category of principles, as much effort has been made to position the project for sustainability. Integration and long-term outlook both score well, while participation and equity are a bit lower. A summary of the scores is displayed below, followed by a more detailed explanation.

Integration	Long-term outlook	Participation	Social equity
			

Principles receiving green rating

Integration

Many of the sustainability-related documents emphasize the importance of integration in the Zuidas development. The 2008 Zuidas sustainability plan places specific emphasis on developing a consistent and integrated approach to the management of ecological, social, and economic issues from the perspective of the whole project – content, process, organization, planning, design, implementation and management (Gemeente Amsterdam, 2008). Since there was not complete follow through on the sustainability plan, it’s encouraging to see that the more recent Zuidas Placemaking Strategy still stresses integrated planning and design as a key design principle with an emphasis on integrating physical and non-physical aspects of development and recognizing the complexity that is inherent in dealing with climate change and sustainability (Gemeente Amsterdam, 2011k) . The intention is clear, only the implementation is a bit more complex. While the planning documents can sketch an integrated vision for the whole area, projects are implemented on a smaller scale and it is sometimes difficult to keep the integration in perspective.

Energy is a good example, while both district and thermal storage heating and cooling solutions are being promoted throughout the Zuidas, efforts are still underway to try to define the most optimal balance between the two systems. Complexity rises since individual commitments have been made to one solution or another and it’s significantly more difficult to coordinate when decisions and investments have already been made. For newer areas, the municipality is trying to get ahead of the process, looking for an optimal solution in the context of its environment and designing such solutions not only from the perspective of energy-efficiency, but also taking the other sustainability themes into consideration such as materials selection, transportation, the natural surroundings, and cost-effectiveness (and inherent social implications). This perspective is recognized by the municipality in the latest energy vision, the challenge is getting individual stakeholders to think collectively – a challenge with no simple solution (Frederiks, 2010).

Lessons learned from Zuidas are that integration is easier said than done, however the municipality remains transparent and flexible to reflect on the challenges and devise new ways for going forward. The sustainability plan was highly ambitious, making it hard to put immediately into practice, especially considering the financial situation. ZIPS helps the municipality achieve integration by using the process as a tool to engage developers and to put their plans in the greater context of Zuidas’ development. Hopefully, with more experience using ZIPS and the emergence of evaluation tools to look at the area scale instead of just at a building scale (e.g. BREEAM Gebied), the ability to place individual decisions in an integrated context will become easier and common practice. This is the cutting edge of area development; only by accumulating experience with the implementation of this principle will performance be improved.

Long-term outlook

The overall planning processes at the municipal level reinforce the importance of a long-term outlook in the Zuidas. Zuidas is the leading development project in the city as cast in the structural vision for 2040 (Gemeente Amsterdam, 2011j). The long-term perspective is important, as the area is expected to be in transition continually throughout the time horizon. Accordingly, the Zuidas will be an area of considerable expansion and new build, making it a key focus point for the city's carbon emission reduction goals and climate neutral building ambitions (Gemeente Amsterdam, 2009e). The challenge is to not allow a long planning horizon to be justification for postponing more sustainable solutions in the near term, especially given the current financial situation. For those already located in Zuidas or considering relocation in the short term, the Zuidas needs to be an attractive place to be now, not in 25 years. In order to combat this tendency, the Zuidas project has also set out a program for the short-term, 15 by 2015, in order to achieve early milestones necessary to improve its livability and positioning the project to meet goals set in the future for 2025 (targeted for CO₂ reductions) and 2040 (project and structural visioning) (Gemeente Amsterdam, 2010f).

Principles receiving yellow rating

Participation

As discussed in Chapter 3, Dutch planning processes have provisions for the inclusion of actors and participation, however it's debatable whether or not these opportunities are opened up early enough in the process or whether they are taken seriously. For Zuidas, all of the standard opportunities for participation have been provided and some additional attention to participation have been discussed in documents that focus on sustainability, however there is not much discussion of an open participation process as part of the plan forming that would help to balance out the large corporate or infrastructural investing actors. This seems like a risk area for balanced participation in the ongoing planning and development efforts.

An effort has been made to identify all categories of stakeholders in the two published sustainability reports and communication with the stakeholders is pursued using many mediums: website, publications, informal and formal meetings, and by facilitating walk-in visitors at the project bureau's office where models of the development can be viewed and questions are answered. As individuals, non-profits, and businesses voice their opinions, the municipality makes an effort to document the correspondence, making it available to the public to enhance transparency (Frederiks & van Eijk, 2009, 2010).

Also important is the creation of a 'level playing field' between all parties involved in the development process in the pursuit of meeting Zuidas' high sustainability ambitions. All parties involved in the development will be asked to sign a code of conduct to declare their individual sustainability contributions and a commitment to helping Zuidas collectively reach their sustainability ambitions (Frederiks & van Eijk, 2010).

Social equity

Of the four principles, social equity receives the least amount of attention in Zuidas. While Amsterdam gets much credit in the literature for being a progressive city, particularly in terms of government support for affordable housing (Fainstein, 2008; Gilderbloom et al., 2009), there is little specific mention of income distribution or equity in the Zuidas planning documentation other than general statements made about promoting diversity and social responsibility. Clearly there is an emphasis on attracting top-level businesses and high-end residents to the Zuidas area and this tends to overshadow efforts towards achieving social equity. Little detail is directly presented in terms of ensuring social equity beyond that of guaranteeing that 30% of new housing is

allocated to the social housing sector. There is little to no mention of dealing with any issues related to immigration, racial integration/segregation, poverty, or homelessness (Frederiks & van Eijk, 2009, 2010; Gemeente Amsterdam, 2008, 2009a, 2009e, 2010b, 2010f, 2011f).

Indirectly, on the other hand, since social housing will be distributed throughout the Zuidas and specific consideration is given for promoting mixed-use development and multi-use buildings (such as providing space for shops and cafés on the street-level in office buildings or apartment flats), the design of public spaces, provision of utilities and municipal services, and provision of infrastructure for transportation and pedestrians will all indiscriminately benefit residents and visitors to the Zuidas area. It's unfortunate that the municipality does not place more emphasis on equity in its planning documentation; this is an area for potential improvement. Perhaps due to a long history of progressive social policy, the principle of equity is so embedded that it is no longer specified, but assumed. However, when an area such as Zuidas is trying to attract both international businesses and residents, it would not hurt to be more specific in regards to the efforts that contribute to the social equity experienced in the development.

Procedures

Procedures are helpful for translating principles into practice. In the case of Zuidas, its sustainability strategy and culture of fostering partnerships and networks gives it green marks, while institutionalization and instruments and tools receive yellow marks. Better communication and management between the municipality's climate and sustainability programs could help to sync up efforts at the project level. This also goes for the use of instruments and tools, where a lack of detailed reporting makes it difficult to compare the performance of different development projects within the city of Amsterdam or more broadly. Below is a summary of the ratings followed by a more detailed explanation of the results.

Sustainability strategy	Institutionalization	Fostering partnerships & networks	Instruments & tools
			

Procedures receiving a green rating

Sustainability strategy

The sustainability strategy for Zuidas has a long history. First brought up in the 1998 Master Plan, sustainability has received increasing focus over time through the 2004, 2007, and 2009 vision documents, the sustainability plan from 2008, the energy vision from 2010 and a sustainability brochure in 2011 (Frederiks, 2010; Gemeente Amsterdam, 2004, 2007, 2008, 2009e, 2011f). There is a clear ambition to make Zuidas an international example for urban sustainability and to exceed both national and municipal ambitions laid out in policy. The strategy includes capitalizing on its prime location (well-connected to public transportation), pursuing densification and mixed-use development, and the promotion of high building standards (BREEAM-NL Excellent). This vision is further reinforced by the city's structural vision, perhaps the most important

municipal planning document outlining the urban and economic growth potential for the city, which places sustainability as a leading theme in the vision for 2040 (Gemeente Amsterdam, 2011j).

As covered in the introduction to the case study above, the 2008 sustainability plan in particular was highly ambitious and laid out a very broad and comprehensive approach to sustainability in Zuidas with as many as 60 indicators that could be monitored to track the implementation of the plan. Unfortunately, external factors such as the world financial crisis and forced budget-cuts brought on by a change of national government made it difficult to allocate the resources necessary to maintain the monitoring that would be required to report on all the indicators presented in that plan (van Eijk, 2011). Instead, the Zuidas Placemaking Strategy (Gemeente Amsterdam, 2011k) has come more into the forefront, as a more practical approach that still maintains an emphasis on sustainability, but does not go into such depth specifying the detailed outcomes. This approach leaves more up to the market and the developers than the previous approach, and recognizes that the municipality is playing a more stimulating than prescriptive role in the realization of its sustainability goals (van der Made, 2011; van Eijk, 2011). The ZIPS strategy reflects the learning's gained from experience and continues to present a clear strategy for the promotion of sustainability in the Zuidas.

Fostering partnerships and networks

Cooperation is evident in the Zuidas project and the municipality has invested considerable time in developing partnerships and networks for the purposes of promoting its sustainability vision. In some cases, this is portrayed in close cooperation with private businesses or utilities such as Nuon or WaterNet for the realization of specific projects. An example is the partnership with Nuon for the creation of a district cooling system (more detail can be found in the energy section below). Another example is the cooperation between the municipality, its waste energy company, and WaterNet to use the sludge waste from the sewage system for the production of sustainable energy (more detail in the waste section below). Other examples of cooperation exist for the stimulation of more sustainable building (with the DGBC), the promotion of businesses to come up with collective sustainability projects (the Green Business Club), and promoting interaction between businesses, students and social sustainability projects (Amsterdam Bright City and Hello Zuidas).

Networks has also taken on importance at the municipal level, as the city is building itself an international reputation for sustainability through its support and participation in several international sustainability networks – ICLEI, a cooperative network for local authorities focusing on sustainability, Eurocities, Clinton Climate Initiative's C40 Cities, EnergieCities (through its involvement in national network Klimaatverbond Nederland), and Covenant of Mayors (Gemeente Amsterdam, 2009a). Amsterdam also recently received a City Star award from the European Union for its Amsterdam Smart City program, which is a cooperative platform between Amsterdam residents, businesses, knowledge institutes, and government to generate ideas for smart energy use and the testing of new technology in Amsterdam. 16 energy projects have been started and over 70 partners have come together in an effort to help the municipality meet its goal of a 40% CO₂ reduction by 2025. Amsterdam Smart City is a product of the Amsterdam Innovation Motor (AIM) & energy network company Liander (Amsterdam.nl, 2011b).

AIM is itself another good example of partnerships, as it is an organization made up of government (municipalities and the Noord Holland province), major knowledge institutions (VU, University of Amsterdam, and Hogeschool InHolland), and private banks (ING, ABN Amro, Rabobank) to develop the economy through the stimulation of innovation. Key focus areas for the organization are the creative industries, ICT, life sciences, financial and professional services, and sustainability (AIMsterdam.nl, 2011). All of the above examples make clear that partnerships and networks have a prominent

role in the formation and realization of projects for both the city of Amsterdam and the Zuidas project.

Procedures receiving a yellow rating

Institutionalization

With the municipal climate office and the sustainability program, institutionalization is strong at the municipal level. Within the Zuidas project, there are also individuals dedicated to sustainability that ensure it remains a priority and help put together tools and reports for its implementation. These are all good signs of institutionalization of sustainability, however what is surprising is the lack of direct coordination between the climate and sustainability programs and the large urban development projects going on throughout the city. Perhaps this is due to the municipality's size and the fact that projects are all managed from separate regional project management bureaus (Amsterdam Noord, Ijburg, and Zuidas as examples), there are minimal institutions in place for the formal communication and coordination between these projects and previous attempts at sustainability reporting have not been broken down in a way where comparisons could be made between projects (Frenken, 2011; Jonkhoff, 2011; Stam, 2011; van Eijk, 2011). This is unfortunate, as a coordinated strategy could be more effective at pursuing sustainability more consistently across all urban development projects. There are signs, however, for optimism. The municipality has recently shifted the climate and sustainability programs out from under the environmental department and over to the department for spatial planning and development (Jonkhoff, 2011; Stam, 2011). While this provides no guarantees, it at least brings the programs closer to the major development projects and provides more direct lines of communication between projects.

Instruments & tools

Zuidas has experience with various tools for the promotion or monitoring of sustainability in the development. Three tools have been the annual sustainability reports, the ZIPS planning strategy, and the selection of the BREEAM standard for sustainable buildings. The ZIPS planning tool was covered in the introduction to the case study above. As for the sustainability reports, more was promised than delivered. While reports were made covering 2008 and 2009, they were high level, with many pages dedicated more to justifying the need for the report, restating the vision of Zuidas, describing the organization and identifying stakeholders than on reporting on the performance of the development. The reports that were given were more summaries of accomplishments rather than critical feedback or reporting according to the identified indicators in the sustainability plan produced in 2008 (Frederiks & van Eijk, 2009, 2010). In an interview with van Eijk, co-author of the annual sustainability report, he stated that not enough resources were available to report on the long list of indicators from the 2008 report and that reporting in such a specific way would detract from time spending time and resources implementing the projects. Unfortunately, this leaves a void of information, making it difficult to evaluate how the development is progressing towards meeting the ambitious vision it has stated in regards to sustainability. At the time of this research, a report reflecting on 2010 was not yet available, however plans were to follow the lead of the municipality by no longer creating a separate sustainability report, but rather integrate the sustainability themes into the standard annual report that also includes all of the financials from the past year (van Eijk, 2011).

BREEAM is an internationally recognized building and development design and assessment methodology created by the BRE Group in the UK. Known for its building certifications, BREEAM certifications are becoming an international standard for evaluating the sustainability of buildings and urban development (BREEAM NL, 2011). The Ravel area of Zuidas was the first to make formal decisions to implement many of

the themes of the sustainability plan with specific emphasis on the sustainability of the proposed buildings. In search for a way to guide this process and evaluate the sustainability of the designs, BRE's Green Print methodology was chosen due to the organization's international reputation which would offer international credibility and benchmarking (Frederiks & van Eijk, 2010). In the process of applying the methodology, modifications to the BREEAM criteria were needed to fit the Dutch market. It is here that the work in the Ravel area of Zuidas helped spur the creation of the Dutch Green Building Council (DGBC), which would eventually do the work of localizing the BREEAM certification schemes for the Netherlands. The DGBC gained the support of many of the market parties involved in the Ravel development and was founded as an independent organization with an aim to facilitate the transition to a more sustainable built environment (DGBC.nl, 2011; Spetter, 2011). Once the DGBC was established, the Ravel area was named a pilot for sustainable urban development (Frederiks & van Eijk, 2010).

Zuidas now uses the BREEAM standard to set the ambition for new buildings, stating the goal that all new buildings strive to meet the BREEAM Excellent status and at a minimum meet the BREEAM Good status. Since many of the companies locating in the Zuidas are international, their developers may be more familiar with another certification scheme. In those cases, efforts will be made to establish equivalents between systems where possible. For example, to accommodate US-based developers, Zuidas considers LEED Platinum to be equivalent to BREEAM Excellent and LEED Gold as equivalent to BREEAM Good (Gemeente Amsterdam, 2008). The BREEAM Excellent/LEED Platinum goal is quite ambitious and meeting the ambition has been a stretch for some projects. According to the BREEAM.nl website, there are currently only 15 certified projects throughout the Netherlands, only 5 of which have been able to achieve Excellent status (BREEAM.nl, 2011b). Due to the high standard and often a higher building cost, the goal is likely only to be attainable in the near term by large corporate investors such as Deloitte, whose newly planned corporate office will be the first Zuidas building to meet the BREEAM Excellent standard when it is completed in 2014 (Gemeente Amsterdam, 2011f).

Additional BREEAM certifications are available for existing buildings and, most recently, for an entire development area - an area being defined as a space including buildings, public space, and infrastructure. The area-based assessment ('BREEAM Gebied') presents an interesting opportunity to evaluate the integration of different sustainability measures by broadening the context beyond an individual building. The six assessment categories for the area-based certification are synergy, natural resources and materials, spatial development, welfare and prosperity, climate, and area management (BREEAM.nl, 2011a). While the certification holds much promise, the BREEAM Gebied is only now reaching the market in its non-pilot form (officially launched during DGBC week in September, 2011), and it's too early to tell how many areas within the Zuidas will seek certification, although the VU Kenniskwartier is listed as a pilot for its development and is perhaps a good candidate. More is presented on the use of these certifications in the Building Retrofits section below.

Policy Areas

Shifting from principles and procedures to specific policy areas helps provide a more detailed look across the spectrum of sustainability policy areas defined for use in this research. The analysis has shown that the Zuidas is well positioned in most areas of sustainability, with only Production & consumption, Food & agriculture, and Building retrofits receiving lesser scores. While there are businesses that could be considered leaders in terms of sustainability, it remains to be seen if they can work together or have a positive effect on the other businesses in the area. The Zuidas is the only project in this study to directly incorporate food & agriculture into its strategy for sustainability, although the scope is small and the city has little influence over the purchase and dietary decisions of individuals. Building retrofits is the only area scoring a red for Zuidas, as very little attention is given for the existing built environment. Nearly the entire strategy

is focused on new build through densification, building on areas previously used for other purposes, or rebuild after the demolition of the existing buildings. A clear strategy for improving the sustainability of the existing built environment is absent in the Zuidas. Below is a table providing a summary of the ratings, followed by a more detailed explanation of each policy area.

Energy	Spatial & land-use planning	Mobility & transportation	Biodiversity & habitat	Water	Waste	Building retrofits	Production & consumption	Food & agriculture	Cultural & historical	Health & wellness

Policy areas receiving green rating

Energy

The municipality has set two main goals in regards to energy and CO₂: to reduce CO₂ emissions by 40% in 2025 in comparison to 1990 levels and to make CO₂ neutrality the standard for all new buildings by 2015 (Gemeente Amsterdam, 2011a). As the largest development project in Amsterdam, Zuidas is committed to doing its part. Since Zuidas has been working on sustainability and energy solutions for some time, much is already known about the energy situation in Zuidas. In the Zuidas energy vision (Frederiks, 2010), it is estimated that only 20-30% of energy demand will be met with sustainable energy sources by 2020 and that the potential for local energy production through solar energy in particular is limited due to high building density. This means that even when maximizing sustainable energy production onsite, Zuidas will still need to source most of its sustainable electricity from elsewhere, purchased from other sources such as wind in the North Sea or solar farms. The biggest hurdle at this point, is organizing the pursuit of sustainable energy collectively where possible and motivating private parties to do their part (Frederiks, 2010).

The Zuidas vision and the ZIPS strategy both mention the creation of an energy users collective or cooperative for the Zuidas, with the goal of purchasing sustainable energy (Frederiks, 2010; Gemeente Amsterdam, 2011k), Despite being actively discussed by organizations such as the Zuidas Green Business Club, such an organization has not yet come to fruition. Another option could be some sort of organized effort to install wind or solar farms elsewhere for the specific purpose of making green energy available to the Zuidas (a strategy used by Tilburg and discussed in the Spoorzone case study), however this approach has not yet been taken up for Zuidas.

Amsterdam does, however, offer a unique approach to using waste for the purposes of energy production. Waste that cannot in any way be reused and that is safe for combustion is sent to the Amsterdam Waste Energy Company (Afval Energie Bedrijf - AEB) where waste is converted into electricity and heating for Amsterdam residents and businesses. Solid sludge waste from Waternet, the water utility, is also processed by AEB, converting sewage waste into biogas for the production of electricity. Energy released from the combustion of biomass qualifies for CO₂ neutral certification and is thus considered sustainable. Of the waste processed at AEB, 48% is biomass. 320,000 households are provided with renewable electricity and 8,333 households with district heating as a result of the AEB every year (Afvalenergiebedrijf.nl, 2011).

The other main option for green energy is through the purchase of green electricity from the energy providers, however there are no requirements or incentives for businesses or households to make use of it. On the other hand, there is quite a bit of work going on regarding the stimulation of sustainable heating and cooling as well as energy efficiency at both the area and building-level, both of which are outlined here below.

According to an energy study commissioned by the municipality for the 2009 Zuidas vision, the demand for electricity in 2020 is expected to increase by 25% over 2003 demand (calculations include the expected expansion and development of Zuidas). The demand for cooling is expected to increase by 31% and the warming demand is expected to decrease by 7%. Importantly, the use of district heating and cooling systems can reduce the demand for primary energy necessary to power heating and cooling systems: district heating is projected to reduce the amount of primary energy necessary when compared to using gas by 12% and district cooling when compared to using electric cooling by as much as 37% (Frederiks, 2010).

The municipality has cooperated with local energy company Nuon for the realization of district heating and the Netherland's first district cooling system (Frederiks, 2010). Using cold water from the depths of the Nieuwe Meer (a lake near Amsterdam), water is cooled and then piped 5.5km to Zuidas businesses for cold water and air conditioning, which has proved especially useful for temperature-controlled computer server facilities (Nuon, n.d.). This system can be coupled with district heating, which is available in Zuidas using excess heat from the VU/VUMC and Diemen (fossil fuel-based) energy production plants and the municipal waste energy facility mentioned above (Frederiks, 2010). Nevertheless, there has been some resistance towards district heating and cooling due to the perception that flexibility is lost with a monopolistic provider. A potential solution would be to separate the district heating companies in the same way that energy companies have been split into separate companies for energy service providers and distribution network maintenance (Frederiks, 2010).

Thermal heating and cooling systems provide an alternative option with the potential for more independence, and have been installed in some of the newer office buildings, however there are choices to be made here as well. Thermal storage systems can be installed and maintained per building, requiring the operation and maintenance knowledge to be brought in-house, or they can be managed centrally for a larger area, requiring more cooperation (Frederiks, 2010). According to the most recent energy vision (Frederiks, 2010), a clear area-based strategy for heating and cooling has proved elusive, despite having all of the right parties at the table. It has been challenging to integrate a joint strategy for thermal heating and cooling with district heating and cooling, as usually there is only enough space/capacity underground for one connection. As substitutable sources of heating and cooling, the tendency is to negotiate with both sources, selecting the provider with the lowest price instead of finding the optimal production level (Frederiks, 2010).

As long as fossil energy is produced in the power plant facilities, it makes sense to recover and use as much excess heat as possible from that process, using thermal heating and cooling to fill the remaining heating and cooling demand (and transitioning more towards the more cost and environmentally efficient solution as fossil energy supply is reduced over time). Therefore an integrated strategy is likely to produce the most optimal result, rather than having each building decide for itself. This is a clear example where better organization is needed, as occupants of Zuidas could benefit from a cooperative energy organization to purchase and supply heating and cooling, reinvesting or returning additional profits to the consumers (Frederiks, 2010).

At the building-level, energy efficiency is stimulated through new build or improving the existing built environment. Improvements to existing buildings will be covered below in the 'Building retrofits' policy area; therefore here the focus will be on new build.

Providing an energy performance coefficient (EPC) score is required nationally in the building code for new buildings and requirements are being ratcheted down over time. In 2006, 0.8 was the maximum score allowed and in 2010 this maximum has been reduced to 0.6 (Rijksoverheid.nl, 2011). Rather than set specific targets for EPC that go above and beyond required minimums, Zuidas has teamed up with the Dutch Green Building Council (DGBC) to promote BREEAM certification for new buildings (Gemeente Amsterdam, 2009e). BREEAM assesses energy by considering the characteristics of the building in terms of efficiency (using EPC scores), metering for energy usage, energy efficient lighting, local production of sustainable energy, energy efficient design of loading and shipping areas, energy efficient cooling/freezing, energy efficient elevators, escalators, and moving walkways, warmth insulation and air tightness (BREEAM NL, 2011). The caveat here is that despite the ambition, there is only limited use of BREEAM within the Zuidas area to date: Ernst & Young's new office took part in the BREEAM pilot, receiving a score of 'Pass' (BREEAM.nl, 2011b) and Deloitte's new office designed to meet the BREEAM 'Excellent' standard will not be complete until 2014 (Gemeente Amsterdam, 2011f). Other applications of BREEAM in the Zuidas area were not found for this research.

Despite these challenges of organization, the Zuidas receives a green rating for the work that is being done in regards to making energy production and use more sustainable. The ambitions are high in terms of CO₂ reduction and all new build CO₂ neutral by 2015. All buildings are being connected either to district heating/cooling or thermal heating and cooling systems, reducing the use of primary energy for heating and cooling purposes. Those involved in the development are aware of the issues in organization and are open in their disclosure by continually publishing updates to the existing visions and publically available documentation. Pilots are also being initiated to promote learning, as Kop Zuidas is a sub-development in Zuidas where an integrated thermal heating and cooling strategy is being pursued. The Zuidas is also still aiming to create an energy users organization for the collective purchasing and/or production of sustainable energy (Gemeente Amsterdam, 2011k).

As for the role of the municipality regarding sustainable energy, all types of governing are present. Authority is used in enforcing energy performance standards (EPC). Provision of district heating and cooling is made possible in cooperation with the local energy provider, Nuon. The municipality is enabling sustainable energy through its development of an area-wide strategy for thermal heating and cooling and promoting its use. It is also involved in promoting the Zuidas energy users organization and participates in forums to discuss energy issues in the Zuidas Green Business Club. In addition, together with the DGBC, the promotion of the BREEAM standard enables higher energy performance, however actual use of the certifications remains low. The municipality itself maximizes its purchasing of green energy from the municipal waste energy company ('Afval Energie Bedrijf' – AEB), however that does not fulfill all energy needs (Gemeente Amsterdam, 2010b). The municipality has also built a new office for Zuideramstel equipped with geothermal heating/cooling and a green roof (Gemeente Amsterdam, 2010a). A summary is provided in the table below.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
<p>Municipality purchases green energy from the Waste Energy Company for its own use</p> <p>Municipal building for Zuideramstel equipped with thermal heating/cooling storage system and emits 60% less CO₂ emissions than a traditional building</p>	<p>Developing a strategy for thermal heating and cooling (WKO)</p> <p>Promoting the use of BREEAM certification with a goal of achieving a rating of 'Excellent'</p>	<p>Partnering with the energy company to provide access to district heating and cooling</p>	<p>Enforcing energy performance regulations for new or renovated buildings</p>

Spatial & land-use planning

The strategy for Zuidas is to intensify the use of the land lying on the southern end of Amsterdam between Amstel to the east and Schipol airport to the west. This intensification will make for a significant expansion of the city in terms of capacity for housing and commercial development while minimizing extensive sprawl if this space were to be instead found outside existing urban and semi-urban areas. The choice for high density and mixed-use offer occupants a wide variety of services within a short distance, making it reasonable for many to get around without an automobile and minimizes the consumption of green space and agricultural land at the expense of urban development (Gemeente Amsterdam, 2009e).

Amsterdam has dedicated significant resources and planning to the Zuidas project, evidenced by the abundance of planning documentation and vision documents that have been published for its development, however a comprehensive new land-use plan for the entire Zuidas development was not among these documents. Instead, the vision document lays out the high level ambition for the whole Zuidas area and detailed land-use plans are created as needed for smaller sections of Zuidas when development is ready to proceed and it's been deemed that no previous land-use plan is still appropriate. New land-use plans have been created for whole sections such as Kop Zuidas (Gemeente Amsterdam, 2010a, 2011d) and Kenniskwartier (Gemeente Amsterdam, 2011d), and in other cases, for specific projects such as the adding of student housing in Ravel in an area that is otherwise zoned for sport and green space (Gemeente Amsterdam, 2011c). In the land-use plans, specific reference is made to the ambitions laid out in the vision document, including a more detailed explanation of the implementation plan. Many aspects of sustainability are covered in the land-use plans including energy, mobility, biodiversity, water, cultural and historical, and health and wellness. Also included is an explanation of the economic viability of the development and the perceived social impact and participation activities. Receiving less attention are matters of individual behavior, such as waste reuse and disposal, food choices, and the production and consumption of sustainable products (Gemeente Amsterdam, 2010a, 2011c, 2011d).

Even with a strong municipal approach to the planning process, much of the development will still depend upon market interest. The effect of the financial crisis combined with an over-supply of office space in the Dutch market has slowed development in the Zuidas, although Zuidas does better than other parts of the city (van der Made, 2011; van Eijk, 2011). As investors show interest in developing, Zuidas will

also need to be conscious of investors’ alternatives – strict planning and regulations in the Zuidas may make other areas more attractive or cost effective for development. It will be interesting to see which areas have more success in developing during this market – a well thought out and detailed planned area such as Zuidas or the more market-driven laissez faire approach of Buiksloterham along Amsterdam’s IJ riverbank. A summary of the role played by the municipality is provided below.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	ZIPS process is designed to be more flexible for market parties, helps create dialog with developers regarding sustainability objectives		Development of a detailed urban plan and high involvement of municipality in planning for development made possible by strong ground position

Mobility & transportation

The core of the Zuidas development is its location – centered on Amsterdam Zuid station with good connections to both Amsterdam city center and Amsterdam Schipol International Airport by both public transportation and the city ring highway system. In the Zuidas vision document of 2007, the goal was stated to minimize auto traffic as much as possible through the provision of public transportation and bicycle infrastructure (Gemeente Amsterdam, 2007). As of 2009, the modal split is 40% public transportation, 30% bicycle and 30% automobile and the ambition is to continue to reduce the percentage of automobiles down to 20% by further increasing public transportation to 50%. In order to meet this ambition, public transportation will be further improved by various infrastructure and service improvements:

- The completion of the North/South metro line, creating more stops between Zuidas and Amsterdam city center
- The expansion of the train station to increase capacity by adding a platform and making the necessary upgrades to host a high-speed rail connection in 2020
- Better integration between train and tram/bus by reducing the walking distance between different modes and improving the efficiency of switching between them
- Provision of additional tram routes
- Provision of more dedicated bus lanes that will improve efficiency of bus traffic to and from the Zuidas

Not only is the city striving to bring the portion of the modal split for the automobile down to 20% by 2020, the city is also striving to increase the percentage of electronic automobiles by improving the infrastructure of available charging points. In 2016, there are 1000 planned charging points in the Zuidas area (Gemeente Amsterdam, 2011k).

Within the A10 ring highway, the bicycle is Amsterdam’s most popular transportation mode and the municipality has a goal of improving its position outside of this ring as well. As the southern half of Zuidas is outside the A10, this goal applies directly to the Zuidas area. To stimulate more bicycle use, the municipality’s approach focuses on the provision of safe and attractive bike routes and the promotion of the electric bicycle, which extends the reasonable bicycle commuting distance from 7.5km to 10km (Gemeente Amsterdam, 2011a). Separated bike paths are already well provisioned in the area and this will be further expanded, along with bike parking facilities, to match the expected increase in density and doubling the bike parking facilities at the Amsterdam Zuid and Amsterdam RAI stations (Gemeente Amsterdam, 2011k). For

walking pedestrians, the minimum sidewalk width is 3.5 meters and much attention is paid to improving the safety and attractiveness of the walking experience (Gemeente Amsterdam, 2009e).

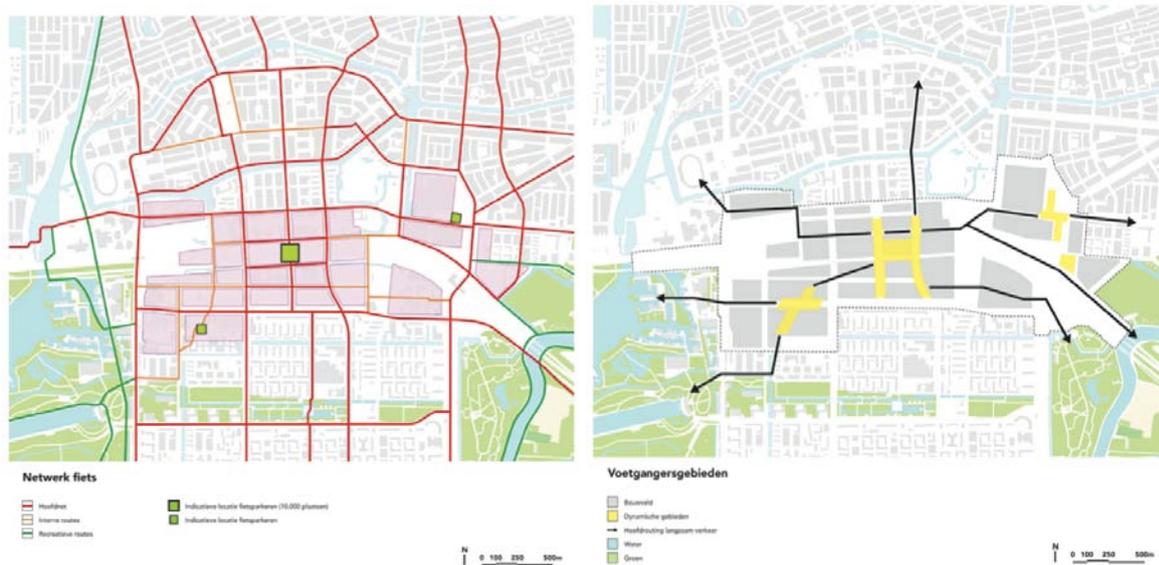


Figure 4.4: Planning maps for bike (left) and pedestrian (right) traffic (Gemeente Amsterdam, 2009e)

Lastly, through the realization of the 'Dok model', moving the train and highway connections underground and developing the space above for housing and commercial purposes, more space will be made available to the biking and walking commuter and the current barrier of this infrastructure will be removed (Gemeente Amsterdam, 2009e).

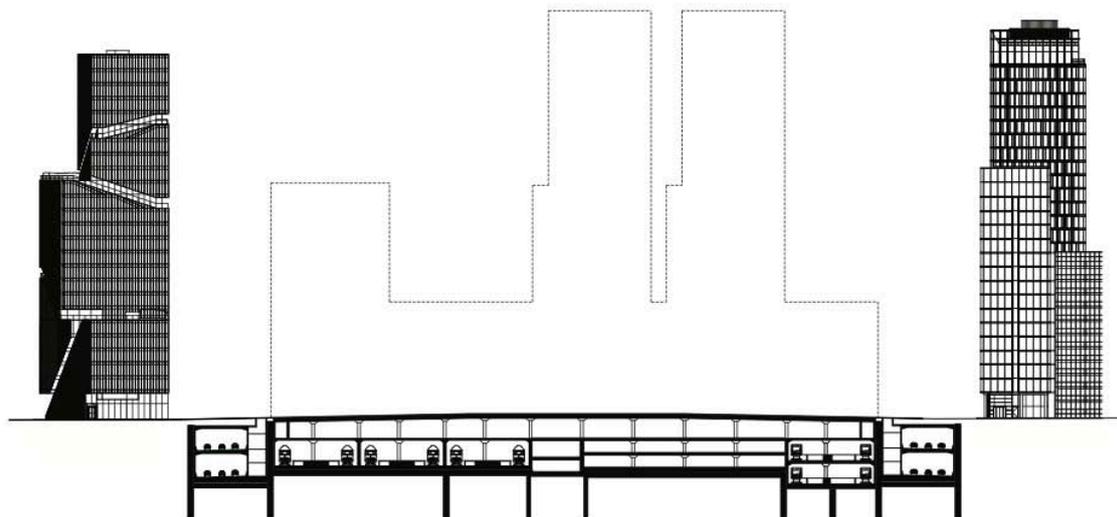


Figure 4.5: Impression of Zuidas 'Dok model' with train, tram, highway, and parking all underground and developed urban space above (Gemeente Amsterdam, 2009e)

The municipality engages sustainable transportation with all types of governing. In terms of authority, the municipality is the leading actor in the transportation planning process – establishing street hierarchies and routes for bicycle and pedestrian traffic. For

provision, the municipality makes alternative forms of transportation possible by ensuring that there is the appropriate infrastructure for public transportation, bicycles and pedestrians. For electric vehicles, €3 million in subsidies were available through 2010 for the purchase of electric vehicles, resulting in the purchase of 260 vehicles (Amsterdam.nl, 2011i), a subsidy worth on average €11,500 per vehicle. More subsidies are also available for electric delivery scooters (Amsterdam.nl, 2011h). Other initiatives are the installation of electric charging stations, including programs for the installation of a charging station at the owner’s private residence or in their neighborhood (Amsterdam.nl, 2011j). For enabling, the municipality promotes the use of electric vehicles as well as alternative forms of transportation (biking, walking). Another example is the municipality’s participation in the Green Business Club, which is currently discussing the potential for electric car-sharing programs (GreenBusinessClub.nl, 2011a). The municipality also governs itself, as it has its own fleet of electric vehicles, including street sweepers, trash collectors, and Nissan Leaf service vehicles (Gemeente Amsterdam, 2011b).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipal use of electric vehicles	Promotion of electric vehicles & alternative forms of transportation Participating in the Green Business Club to promote car sharing between companies in Mahler4	Provision and expansion of diverse and well connected forms of public transportation Bicycle and pedestrian walkways ensure space and safety for non-motorized traffic Provision of charging stations for electric vehicles	Transportation plan is developed and implemented by the municipality

Biodiversity & habitat

‘Ecology and landscape’ is defined as one of eight focus areas for its contribution to sustainability in the Zuidas, putting emphasis on maintaining and improving biodiversity as a goal of the area’s further development. Zuidas is situated between the Nieuwe Meer Lake and the Amsterdam forest to the west and the Amstel River and Beatrix Park to the east, connecting the area to Amsterdam’s wider ecological network. These boundaries are also symbolic for Amsterdam, as the weaving together of green space and water together with streets and public squares make up the defining framework for the city (Gemeente Amsterdam, 2009e). Consideration is given to the connections between natural areas, forming natural corridors throughout the Zuidas. Where there are currently weaker connections, such as an east/west corridor with a good connection to Beatrix park, plans are made to reinforce and strengthen the connections with the greening of canal banks for the Zuider Amstel canal as well as the planting of trees and provision of green space in the Dok zone, the center of Zuidas (Gemeente Amsterdam, 2011k).

As a general strategy, the increased densification of Zuidas will not mean less green or fewer trees. Streets are to be lined with trees wherever possible and money is set aside for the development of green space with each m² sold for commercial purposes. This will be used for the improvement of existing green space, the planting of trees, and the allocation of new green space, whether that is on the street level, building façade or rooftop. For all roofs under 80m², at least 50% of the roof space needs to be covered in (preferably usable, as opposed to purely functional) green. Existing trees in the Zuidas

are inventoried and evaluated for monument status (and thus protected) as part of the planning process. Receiving of monument status is based on criteria such as whether it is a visually defining characteristic of the space, has cultural-historical value, natural value, rarity, age, and life expectancy. While only some trees are given monument status, all trees and available green space are evaluated and a plan is developed to maintain, replant, or provide financial compensation for the removal of any trees during development. During the development phase, strict bookkeeping is required regarding the tree inventory (Gemeente Amsterdam, 2011k).

In denser areas of the Zuidas where new parks are not possible, green is sought through the creation of (sometimes collective) gardens located on the interior of the block, making use of buildings with a sort half open structure, or with the installation of green roofs and rooftop gardens, which have been subsidized by the municipality⁹. These urban green spaces all have the added benefit of water retention reducing the flow of rainwater to the city’s stormwater system (as mentioned in the analysis for water) (Gemeente Amsterdam, 2009e). As for biodiversity, municipal policy provides for studies that identify the current species present in the area, those at risk, and those that could be added to complement the existing species in combination with the new build (such as bird species that take advantage of high rise buildings for nesting) (Gemeente Amsterdam, 2011k).

The municipality utilizes all types of governing while working towards goals of biodiversity and green space. Authority is used to enforce strict regulations regarding the removal or displacement and compensation of trees and green space. The municipality provides for green space by planning and implementing a green structure, lining streets with trees and providing for public parks and green space along canals. Subsidies have also been available for the provision of subsidies for green roofs and walls. Amsterdam and the city bureau in Amsterdam Zuid is also enabling additional green space and biodiversity by promoting green roofs and walls for individuals, companies, and owners associations and by encouraging the use of BREEAM building certifications. Zuidas is also piloting the use of area-based certifications such as ‘BREEAM Gebied’ that evaluate the built environment in the context of its natural surroundings. In terms of self-governing, a new city office for Zuideramstel has been built with a green roof (Gemeente Amsterdam, 2010a).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipal Zuideramstel office built with green roof	Promoting of green roofs and walls & encouragement of ‘BREEAM Gebouw’ Piloting more comprehensive certification schemes such as ‘BREEAM Gebied’	Provision of trees along roadways & development of public green space Subsidies for green roofs & walls	Strict regulations regarding removal of trees and green space

⁹ The subsidy became available in 2009 for €20-25/m² for a maximum of €1000-2500 per roof. €200 is also made available towards an estimate for the project (Groendak.info, 2009). In 2011, the subsidy was expanded to €50/m² for up to 50% of the total cost, capped at €20,000 (Amsterdam.nl, 2011e).

Water

Water is often an area of strong importance in Dutch planning and is highly regulated by national, provincial and municipal law. Water is perhaps the most defining characteristic of Amsterdam, as canals connect nearly all areas with the larger fresh water network provided by the larger shipping canals and lakes (see Figure 4.6 below). In land-use plans, a water paragraph has been a required section since 2003, wherein topics such as water safety, flooding, sewage, provision of drinking water, health, subsidence, and groundwater quality are all considered in the land-use and development planning. As with any development requiring new permits, the redevelopment and expansion of the Zuidas will require all building sites to be brought up to current regulatory standards, which will result in an improved water quality through ground pollution cleanup as well as better management of surface water through the upgrading of the sewage system and drainage planning (Gemeente Amsterdam, 2009b).

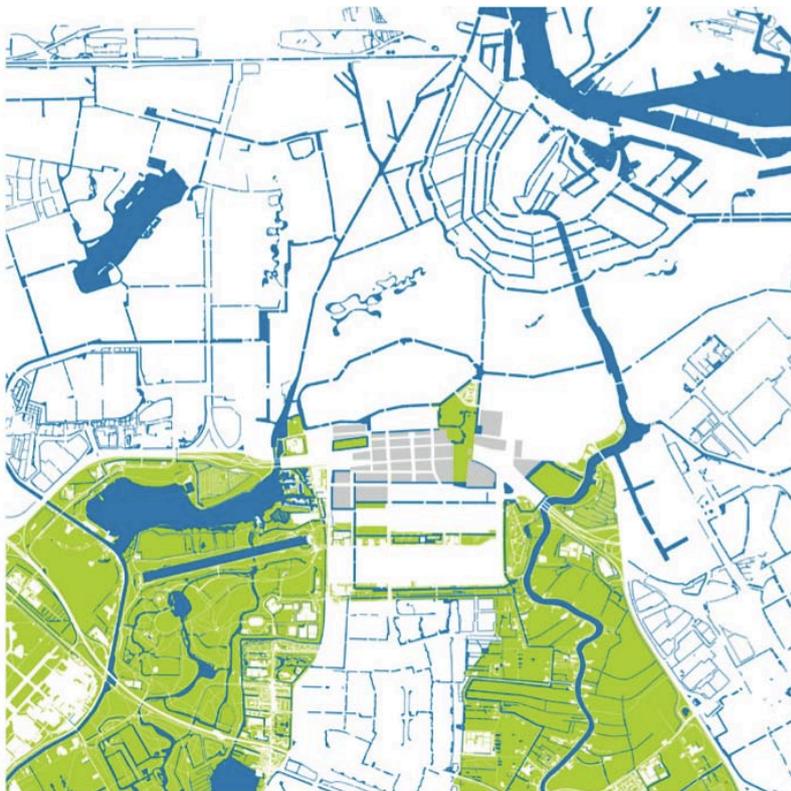


Figure 4.6: Amsterdam's open water system (Gemeente Amsterdam, 2009e)

In 2002, a vision for water management was developed as a building block for the Zuidas vision in 2004. Under consideration were strategies and guidelines for managing ground, surface, and rainwater, including the increase of water storage capacity to improve the water balance and providing for this capacity as close to the source as possible, thereby dealing with excess water onsite. In Amsterdam, as in much of the western portion of the Netherlands, an advanced polder system has been created to manage water levels, pumping water out in order to keep the land dry. While the polders help manage the ground water, stormwater is managed by first capturing all that is possible onsite, storing as much as possible, and naturally draining what remains to flow through the natural water system. Managing water in this order helps to avoid overflows associated with peak water events and green roofs, gardens, and retention ponds are encouraged as design elements that are not only attractive, but functional - capturing and storing water onsite and thus improving the water system (Gemeente Amsterdam, 2009e).

An important monitoring tool is the detailed water balance model built and maintained by the water utility, Waternet. With every building permit request, the model is tested for the effects on water management and water levels. In some cases, such as for the developments in Kenniskwartier and Ravel, artificial basins are temporarily installed to ensure that the system is not over-taxed. Other interventions for new buildings are water retaining green roofs and other systems such as rain gardens and retention ponds for delaying water flow from the property during peak water events. Waternet also uses the water balance model to evaluate the potential for disturbance to the ground water supplies, especially with the building of deep basements or underground infrastructure (such as proposed in the 'Dok model') (Gemeente Amsterdam, 2011k).

Water policy is an area where the role of the municipality, in combination with other levels of government, can rely more on authority. There are strict regulations enforceable through building permits that ensure that development does not negatively affect the integrity of the water system. In coordination with Waternet, the municipality provides the main infrastructure for water management including canal and sewage systems. Efforts at enabling are mostly through the promotion of water efficient design through BREEAM or LEED building certifications and stand-alone efforts promoting the water-retention capabilities of green roofs.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promoting water efficient design through encouragement of BREEAM/LEED building certifications as well as promotion and subsidies for green roofs	Provision of water management system, including canal and sewage systems in collaboration with water utility (Waternet)	Strict water policy ensuring effective water management and water safety Analyzing the effects to the water system in the building permit process

Waste

Waste is also defined in the Zuidas vision as one of eight focus areas for improving sustainability, which includes consideration for waste separation, processing, and ultimately energy production by the Municipal waste energy company (Gemeente Amsterdam, 2009e). For most purposes, waste is handled the same in the Zuidas as throughout Amsterdam and the current municipal campaign for waste separation has been underway since 2010. Separation is possible for glass, paper, small chemical waste, vegetable, fruit, and garden/decomposable waste, plastic packing material, small electronic equipment, light bulbs, other large waste such as old furniture and appliances, building waste (from construction), textiles, and asbestos waste disposal. While disposal for most items close to home is possible, items such as electric equipment and large waste can be dropped off at central collection sites or by a number of independent second-hand stores making it more feasible for waste items (or at least salvageable parts) to be sold to new users or production facilities. Materials reuse in building construction is another of the eight key focus areas for sustainability – at least 90% from materials should be reusable (Gemeente Amsterdam, 2011k). For electric devices, 77-92% of each device can be recycled (Afval.amsterdam.nl, 2011).

Other notable initiatives are the municipality's efforts include the municipal waste energy company, as mentioned in the energy section above, and efforts towards improving the environmental performance of waste collection and processing by upgrading to more efficient vehicles and training its staff in driving more efficiently (Gemeente Amsterdam, 2011h). Also, by working together with the Dutch Green Building Council to promote

BREEAM certification, they are promoting the reuse of building materials and the minimizing of waste, which part of the evaluation criteria for building certification (Gemeente Amsterdam, 2008).

The municipality is again engaged in all forms of governing in the pursuit of improving waste management. Authority is used for regulating proper waste disposal. Provision ensures waste separation collection facilities and programs. Also, the municipality’s creation of the waste energy company provides a means of reusing waste products. Enabling takes place through the promotion of waste separation and also in partnership with the DGBC for minimizing waste in the building process. Examples of self-governing are the procurement of environmentally efficient waste collection vehicles and training of staff in environmentally efficient driving techniques.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Investing in waste collection vehicles that achieve higher environmental performance Training of waste collection staff to be more efficient drivers	Promotion campaigns to make use of waste separation facilities Partnering with the DGBC for the promotion of waste-saving build processes promoted by BREEAM certification	Provision of waste collection facilities and programs for separation of waste Creation of the waste energy company (AEB) to make use of otherwise non-reusable waste	Regulating for the proper disposal of hazardous waste

Cultural & historical

In its efforts to position itself as a new urban center in Amsterdam attractive to an international market, Zuidas aims to promote and develop an artistic and cultural scene to match. Having cultural activities and exhibits adds to the character and the identity of the city and therefore can make Zuidas a unique place that attracts a diverse group of people, businesses, and other organizations. The goal is to steer the cultural activities to contribute to the identity that Zuidas has set forth to create: international, Amsterdam, ambitious and thriving (Gemeente Amsterdam, 2011k).

The creation of such a culture is easier said than done and the role of the municipality is to play more of a directing and supporting role as opposed to being the primary investor responsible for the provision of initiatives to stimulate the cultural development (Gemeente Amsterdam, 2011k). To get things started, the municipality created an art program for the Zuidas in 2001, establishing a vision and implementation plan for achieving the desired culture – the Zuidas Art Concept. Included in this program was the establishment of a supervisor role to provide oversight and ensure the integration of permanent artwork into the city-build, architecture, and public space as the development proceeds (Virtual Museum Zuidas, 2011).

Stemming from this program is the creation of the Virtual Museum Zuidas Foundation (VMZ). As the name implies, instead of a physical museum, the VMZ is an organization that sees the whole Zuidas area as a living and changing museum and takes responsibility for initiating and stimulating artistic and cultural projects in the area. The VMZ is an independent organization, with board members representing the business community as well as the Dutch art community. The VMZ works in close coordination with the urban development supervisor of Zuidas, the physical planning department of Amsterdam, and other partners for the realization of its goals. Many projects have been implemented as a result of the VMZ, too many to cover in this research in detail, however some examples will be shared (Virtual Museum Zuidas, 2011).

Since 2007, the CASZuidas video screen situated next to the WTC and Amsterdam Zuid station has been an example of contemporary art in a public space that has provided a platform for the display of video art, photography, film and new media. It has also been used for the public presentation of important sporting and news events such as Olympic ceremonies, the World Cup, Giro d' Italia cycling race (for stages hosted in the Netherlands), and US President Obama's inauguration speech. The popularity of the CASZuidas video screen has inspired an expansion of the concept with the development of the Video Screen Park in the south of the Zuidas area with the purpose of being an open-air urban museum – presenting artistic and cultural expositions on the screens 18 hours per day (Virtual Museum Zuidas, 2011).

In 2004, another initiative of the VMZ, in collaboration with the VU University Faculty of Arts and the Sandberg Institute, is the Zuidas Free Spaces Artists in Residence (AIR) Program. In this program, 5-6 artists are given space for 3-6 months at a time within the former St. Nicolaas Monastery where they can carry out independent research on the Zuidas and develop artwork made specifically based on the experiences in this location and context – a display of urban planning from the perspective of an artist. The resulting artwork is showcased annually in an exhibition hosted in the adjacent KunstKapel (art chapel), which is the former St. Nicolaas Chapel and another project of the VMZ. Some of the products of the program have since been on display in other museums in Amsterdam and Paris and the program is seeking to further expand its international profile by attracting artists from other countries (Virtual Museum Zuidas, 2011).

Another initiative specifically for the development of culture in the Zuidas is Amsterdam Bright City located just south of Amsterdam Zuid station. A private initiative, jointly founded by private businesses (such as Accenture, Heineken, IBM, ING, KPMG), educational institutions such as the Free University (VU) and the VU Medical Center, and non-profit organizations such as the ExpatCenter, Amsterdam Bright City is bringing together business, science and culture under one roof. The location offers space for networking and socializing in the Grand Café and conferencing meeting facilities and flex-work space in the Smart Work Center. There is special emphasis on promoting interaction and networking between students and professionals. Educational opportunities and master classes are also offered through the educational arm of the organization - Amsterdam Bright College. Events have been organized and held at Amsterdam Bright City such as conferences, symposiums, concerts, and readings and with topics ranging from business skills development, to photography expositions and philosophy readings (Amsterdambrightcity.nl, 2011).

The role of the municipality in the case of developing cultural and historical offerings is primarily through provision and enabling. Provision is used in the municipality's efforts to develop a vision and a plan for culture and the arts and establishing a supervisor to look after its implementation. This program set the VMZ concept in motion that is now largely responsible for the further development of the cultural and artistic offerings in the area. The municipality further makes space available enables for cultural and artistic events helps with the promotion. Organizations such as Amsterdam Bright City do not rely on the municipality for their existence; therefore the municipality has not played a key role in its development. Like in other cities, the municipality uses authority when necessary to protect and conserve cultural and historic monuments.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promotion of cultural & historical events	Establishing a municipal program for developing art and culture and establishing a supervisor to be responsible Provision of space for events and exhibits to take place in public	Protection of monument sites

Health & wellness

In the Zuidas vision for sustainability, health and wellness is directly named as one of the eight focus areas (Gemeente Amsterdam, 2009e). While it may be hard to directly influence the health and wellness through urban planning and design since individual behavioral choices and perception will vary each individual's experience and outcome, many of the developments in the other policy areas contribute at least indirectly to the overall health and wellness experienced by the people in the Zuidas area. In Zuidas, health and wellness is approached through the design of public space, promoting and allowing temporary use of space awaiting development, and taking efforts to minimize the negative effects experienced during the long construction phase (Gemeente Amsterdam, 2011k).

Plans and designs for public space include attention to the amount of sunlight, clean air, noise minimization, wind protection, and the accessibility of green space (including the public use of roof space). Temporary use of unused or idle land is encouraged in order to avoid voids or dead spaces in the development and to ensure the area stays lively and in-use - this helps to avoid unwanted uses of space that may degenerate the quality or safety of the area. Builders in the Zuidas are required to maximize efforts to minimize noise nuisance during the build phase and the municipality actively monitors the air and noise quality throughout the development (Gemeente Amsterdam, 2011k). If and when the Dok model is realized, additional benefits are expected in terms of minimizing noise and air pollution (Gemeente Amsterdam, 2009e).

In compliance with European norms, Amsterdam and the area of Zuidas is seeking to meet air pollution reductions by 2015 by setting a maximum NO₂ concentration at 40 micrograms per cubic meter (µg/m³) and a maximum concentration for airborne particulate matter (PM10) also at 40 µg/m³. Since these norms are set in the 2007 law for air quality, the city must pursue these goals. At this time, the Amsterdam Zuid city area is in compliance with the airborne particulate matter norm, however there are places where the norm for NO₂ is being exceeded. There has been an ongoing program for the improvement of air quality in Amsterdam and an associated action plan went into effect in 2006. While most items have been implemented, the city is still pursuing a number of initiatives in the program from 2011-2014 including: stimulation of electric vehicles, establishment and implementation of transportation management plans encouraging the use of public transportation, bicycle and walking as alternatives to automobile transportation, and the use of vehicles within the municipal fleet that have higher environmental performance (Gemeente Amsterdam, 2011h).

As for noise nuisance, Amsterdam has set a goal to reduce the noise level for city street traffic to under 68dB by 2018. In the Amsterdam Zuid city area, 9% of the housing

experiences noise levels above 68dB. A list has been formed with the most severe cases, and a subsidy has been made available to help pay for insulation to reduce the nuisance. Different techniques are used to reduce the noise generated from the roadways, including noise reducing pavement, sound barriers, as well as maximum speed reductions aided by speed bumps and other roadway obstacles designed to reduce speed. In addition to roadway noise, the municipality has also developed a procedure to reduce the noise from the restaurant and café industry. A process is available for residents to make complaints about particular locations and residents in problem areas can obtain a subsidy to improve the noise insulation in their homes (Gemeente Amsterdam, 2011h).

The municipality’s authority stems from regulation for air and noise pollution, as well as mixed-use zoning that helps create diversity and vitality. Provision comes into effect in the construction of roadways and public space where noise reduction techniques can be implemented. The provision of municipal lighting along streets and in public spaces helps to improve safety. Wellness also is improved through the provision of public space, creating open and accessible spaces that allow for social interaction. By promoting cleaner forms of transportation, the city is trying to enable others to improve their health and improve air quality and by promoting the temporary use of idle properties, dead spaces are avoided, improving safety. Municipal efforts to improve the environmental performance of their vehicle fleet helps to reduce air pollution.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Making use of environmentally superior vehicles in municipal fleet to reduce air pollution	Promoting sustainable and cleaner forms of transportation to promote active lifestyles and reduce air pollution Promote temporary use of otherwise unused property to avoid dead spaces	Making use of noise dampening structures and sound barriers for roadways (or move infrastructure underground – ‘Dok model’ Municipal lighting of streets, waterfront, and public space Creation and design of public space	Enforcing noise and air pollution standards Zoning for mixed-use creates opportunities for diversity and vitality in the area

Policy areas receiving yellow rating

Building retrofits

With 1.5 million m² of the total 4.2 million m² already built, the Zuidas development is already host to a substantial amount of existing buildings that will need attention in terms of improving their sustainability (Gemeente Amsterdam, 2009e). To some extent, improvements are made when existing build is connected to more sustainable forms of energy such as district or geothermal heating and cooling systems (mentioned in the energy section above) or when further densification brings amenities closer, allowing for a reduced need to travel and better provision of public transportation made possible by an increased user base. However, a more targeted strategy is needed for making improvements to existing buildings. Such a strategy does not exist specifically at the scale of the Zuidas, but rather at the municipal-level. Therefore, municipal efforts for improving the existing buildings in the housing market will first be discussed, followed by additional efforts within the Zuidas related to the pursuit of building certifications.

In an effort to meet municipal CO₂ reduction goals, the new municipal sustainable energy strategy has set a goal of raising all buildings to a minimum standard of a B energy label by 2040 (Gemeente Amsterdam, 2010c). Within Amsterdam, it is estimated that 40% of the total CO₂ emissions are specifically attributable to household electricity, gas, and heating, making a targeted program for improving the energy efficiency of existing housing a priority for the Amsterdam climate office (Amsterdam.nl, 2011d).

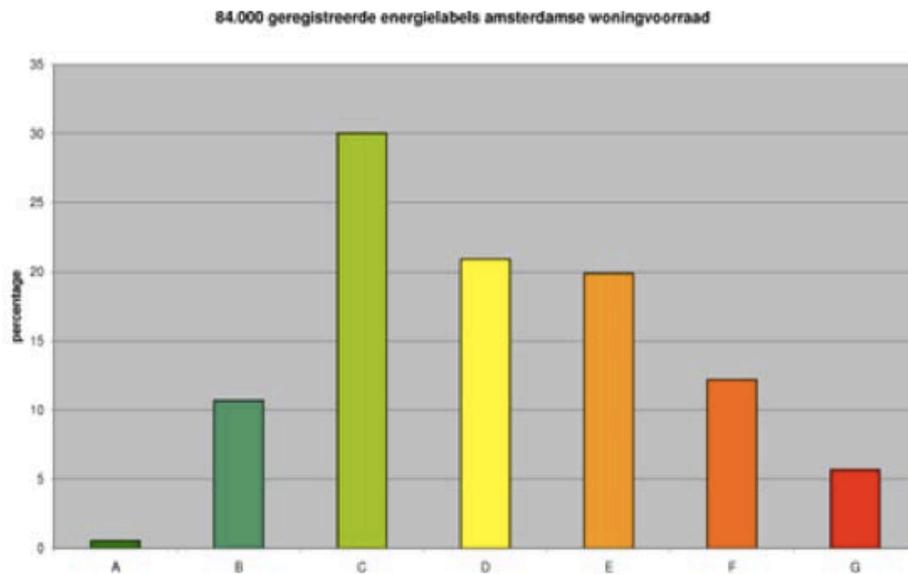
The Amsterdam housing market consists of approximately 380,000 residences and can be broken down as follows: 49% socialized housing, 29% occupant-owned, and 22% rented housing (see Figure 4.7 below). An energy-efficiency strategy is being pursued for each of these market segments.



Figures 4.7: Pie graph showing a breakdown of the Amsterdam housing market – 49% social housing, 29% owner-occupied, and 22% rented housing. Bar chart shows energy label breakdown for the 84,000 residents with registered energy labels (Amsterdam.nl, 2011c)

84,000 residences in Amsterdam have registered energy labels (roughly 30%), most of which are owned by housing corporations. The average energy label for these residences is D, on a scale where a label of G is the lowest and A++ is the highest possible rating (see Figure 4.8 below). While raising the standard is good for reduction of CO₂ emissions, affordability of energy is also an issue here. While the cost of rent for socialized housing is lower, Amsterdam estimates that the 2018 energy costs of living in an apartment with G label will be four times as high as the costs of a comparably-sized

apartment with an A label, approximately €2,000 more per year (Amsterdam.nl, 2011c).



Figures 4.8: Bar chart showing Amsterdam's residential energy label breakdown for the 84,000 residences with registered energy labels (Amsterdam.nl, 2011c)

In an effort to work with social housing corporations, the municipality of Amsterdam uses covenant agreements to assure affordable rental rates and sufficient housing for different target groups (retired, physically and mentally handicapped, homeless, students, and large families). The city then grants the social housing companies the right to build to fulfill Amsterdam's growth targets, which requires 24,000-36,000 new residences over the next 10 years. In the most recent agreement, additional provisions have been added for energy efficiency improvements, those that meet the provisions get more building opportunities (de Alliantie, 2010).

Covenants have also recently been formed to make improvements to the rented-housing segment – a first for Amsterdam. Together with three housing-related associations - Amsterdams Steunpunt Wonen, the Huurdersvereniging Amsterdam, and Vastgoedbelang – agreements have been made to control price increases on the one hand, while on the other, stimulating energy efficiency measures to reach the B energy label (Amsterdam.nl, 2011g). By 2014, the focus is on sharing best practices with residents for energy saving behavior and assessing the current energy levels, resulting in the registration of the current energy label and recommendations for further improvements (Energie Prestatie Advies). This effort would double the amount of residences with registered energy labels by 2014 (Amsterdam.nl, 2011f).

The remaining segment is for owner-occupants, making up 29% of the market. For this segment, the strategy is less proactive. In general, the municipality has found that the quality of owner-occupied housing is higher, although the energy labels for this segment are often not registered. The municipality relies more on the initiative of the owner or the collective owner's association to make improvements to this market segment. Websites have been made with helpful tips for energy savings, potential building improvements that could be made, information about financing and subsidies, and information regarding building permits (Amsterdam.nl, 2011a).

While these municipal-level covenants and initiatives for the housing sector do not address all existing build, they do provide an example for how the municipality can segment the market, identify collectives, and develop an approach to target existing build without directly addressing each individual household or building owner separately.

Perhaps the biggest point of critique on these initiatives is that they are most focused on energy and social equity (from a cost perspective) and less focused on provisions for the other sustainability areas which are related to housing including biodiversity, water, waste, wellness, etc. Equipped with an understanding of the municipal-level initiatives for existing buildings, the remaining paragraphs will focus on the opportunities within the Zuidas development.

In contrast to the initiatives at the municipal level, a more market led approach is taken within the Zuidas through the promotion of BREEAM certifications discussed above under Instruments & tools – BREEAM Gebied, BREEAM Bestaande Bouw and BREEAM Nieuw Bouw. The most promising certification from an integration perspective and for its inclusion of more sustainability-related themes is BREEAM Gebied, which is the area-based certificate that evaluates how the buildings integrate with their surrounding areas. Since the Gebied certificate is relatively new (it was in pilot status until officially launched in September, 2011), there are no areas yet certified, however VU Kennis Kwartier in the Zuidas is listed as a pilot area (BREEAM.nl, 2011a).

The certificate for existing build ('BREEAM Bestaande Bouw') is actually focused more on the ongoing management, maintenance, and building use once build/renovation is completed (resulting in three separate scores for the building, management, and use). In the case of major renovation projects that require building permits, the BREEAM certification for new build ('Nieuw Bouw') is actually more appropriate, as the new build certificate serves as the initial or baseline certificate for the renovated design which can be reevaluated every three years with BREEAM Bestaande Bouw to ensure continued compliance and performance (BREEAM.nl, 2011c).

While the Zuidas has set expectations of BREEAM use for new build, other certificates are not actively promoted or discussed in the planning documentation other than indirectly through their cooperation with DGBC. Since the improvements inherent in meeting BREEAM standards will require investment, not to mention administrative costs for going through the process, there would need to be an incentive for private parties to engage in this process. The market may provide that incentive if it were to improve the resale value of the building, allow them to charge higher rents, or perhaps banks could provide attractive financing schemes when compliance is met, however examples of such incentives were not identified in Zuidas during this research. While the Gebied certificate offers the most promise from an integrated sustainability perspective, it is also more challenging, as it requires additional organization and collective financing to seek and meet the requirements.

In terms of the role for the municipality, authority is used by negotiating covenant agreements with social housing companies and the rented housing sector. Also, authority comes into play with the enforcement of building standards when issuing building permits for major renovations. Encouraging BREEAM certifications helps to enable building retrofits, but this effort has thus far been limited for existing buildings.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Encouraging the use of BREEAM certifications for existing buildings and areas		Covenant agreements with social housing corporations and the rented housing market Enforcement of building standards and codes when major renovations require new building permits

Production & consumption

By promoting its goals to be one of the most sustainable urban centers in Europe, the Zuidas is trying to create a culture that will attract sustainable companies and sustainably minded individuals to locate in the area (Gemeente Amsterdam, 2011f). This vision is starting to become a reality for Mahler 4 and the area surrounding 'Zuid plein' (square), which is the center of the new business district and home to large national and international companies such as ABN Amro Bank, ING Bank, Vesteda Real Estate Development, Ernst & Young, Accenture, and soon to be Deloitte.

ABN Amro in particular has taken an active role in helping to build the community around environmental and social sustainability in Zuidas with their involvement in the Green Business Club, Dutch Green Building Council, and Amsterdam Bright City (Duurzaamgebouwd.nl, 2008; Energievastgoed.nl, 2011; van Doorn, 2011). In 2009, Vesteda was awarded the status of most sustainable real estate developer worldwide, a result of an evaluation by the Global Real Estate Sustainability Benchmark (GRESB) looking at both the performance of their projects and corporate sustainability goals (GreenBusinessClub.nl, 2011c). ABN Amro and Vesteda, together with Accenture, have also launched a electric car-sharing programs in Zuidas (Thenewmotion.com, 2011) Also, companies with an interest in sustainability are at least more likely to invest in the construction of a building that meets the BREEAM Excellent standard, evidenced by Deloitte's newly planned sustainable office building, which will become the most sustainable office building in the Netherlands (Gemeente Amsterdam, 2011f).

To further stimulate the involvement of these companies in collective sustainability initiatives, the Green Business Club has been founded by a combination of private businesses and public organizations. The Green Business Club exists to bring together various parties that will work together to initiate, stimulate and realize sustainability initiatives. In order to generate interest, it offers networking events and inspirational speakers open to its members and potential members (Gemeente Amsterdam, 2011f). Current initiatives have been to come together to discuss an energy vision for Zuidas, projects to stimulate corporate car sharing and the 'new working', flex-work programs that cut down on travel needs, and a Green Finance Lab for the financing of sustainability projects (GreenBusinessClub.nl, 2011b).

The question is whether or not the work of a few leading organizations such as ABN Amro, Accenture, Vesteda and Deloitte can actually inspire others to follow. At this point, it's hard to tell whether or not their enthusiasm is contagious. As an example, in August of 2010, NextEnergy challenged the businesses of Zuidas to install 3000 solar panels in a year. The challenge quickly received municipal support from both the project management bureau of Zuidas Amsterdam and the municipality. Initial conversations seemed enthusiastic and included the VU, RAI, ABN Amro, Accenture, Virtual Museum

Zuidas, and the municipality of Amsterdam. Presentations were held at the Green Business Club to further promote the challenge. Ultimately, the goal was set for the end of 2011. As of November 2011, the only investors have been ABN Amro, Accenture, and Binck Bank with a total 301 solar panels¹⁰. With two months to go and the last update to the website in May, the outcome doesn't look too promising (Zuidassolar.nl, 2011). While this initiative doesn't necessarily speak for all initiatives, there is a distinct pattern forming as to which companies are routinely involved in such initiatives in Zuidas. While companies may be willing to invest in their own facilities and their businesses, it remains to be seen whether or not businesses will come together collectively to improve the sustainability of the community where they have located.

Other initiatives aimed at sustainable production and consumption are facilitated more from the municipal level and include a sustainable purchasing strategy and the Amsterdam in 2020 program which strives to create a sustainable and innovative economy in Amsterdam. The municipality came out with its first sustainable purchasing strategy in 2007, which has been since updated in 2010. The ambition is to be a leader in sustainable purchasing, making as many of the purchases from the municipal organization as sustainable as possible. Being realistic, there is recognition that there are sometimes reasons why the sustainable option is not feasible at a particular time. In 2010 that purchasing goal was 75% sustainable and by 2015 the expectation is that 100% of municipal purchasing is sustainable (Gemeente Amsterdam, 2009a). While the program is only for the municipal organization, the scale is not minimal, as the municipality purchases €1 billion worth of goods and services per year. In this regard, the municipality has put together a purchasing guide with practical examples for the municipality to use and made it available to the public. The guide is not meant to be a prescription, as the market is dynamic and the most cost-effective and sustainable options are constantly changing (Gemeente Amsterdam, 2010d).

As an example of the purchasing strategy, the municipality has used a total cost of ownership model to help make materials selection for the paving of streets. After conducting a lifecycle comparison between bricks and concrete, the municipality determined that bricks were the more sustainable material due to its ability to be reused and ultimately require fewer natural resources and produce less CO₂ emissions – thus a lower total cost of ownership in comparison to concrete over the long duration (DMB.Amsterdam.nl, 2010).

As outlined in the Amsterdam 2020 program, the municipality is also trying to stimulate the sustainable economy and make a link between sustainable business and innovation. A key strategy here is the clustering of knowledge institutions, creative industries, and government – which can be found in the Zuidas. Additional attention is given for small and medium enterprises (SMEs), often the companies agile and flexible enough to create new innovations. SMEs are responsible for 25% of Amsterdam's CO₂ emissions, however their size makes it difficult to find the resources to make sustainability and energy efficiency improvements. It is this reason that the municipality created the 'EnergieLoket', a support office for SMEs to help ease the burden of tackling energy-efficiency by arranging delivery, installation, assembly and financing of energy-related improvements. As an example of stimulating the market for sustainable tourism, the municipality came up with a 'Green Key' certificate to hotels that met specific environmental and energy efficiency criteria. Now, the city promotes a menu card of sustainable hotels in the area and helps promotes environmental and energy-saving measures that can be incorporated into the design when new hotels are built (Gemeente Amsterdam, 2009a).

¹⁰ ABN Amro installed 137 and Binck Bank 164, no follow up was found on Accenture's investment

Production and consumption is an area where there is little the municipality can do in terms of authority, as the market remains open and competitive for businesses and consumers to make their own choices based on their own priorities. What the municipality can and does do is try to make provisions and enable sustainable businesses in the Zuidas. The creation of the 'EnergieLoket' provides support to SMEs in their efforts to make energy efficiency improvements. The municipality also enables more sustainable practices through its involvement in the Green Business Club. Since the market for sustainable products is still growing, the municipality can also make a contribution as one of the largest collective consumers of products and services by implementing a sustainable purchasing program, where it can channel up to €1 billion per year to products and organizations that are making high quality, affordable, and more sustainable products.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipal choice for bricks over concrete streets based on total cost and reusability of the material Sustainable purchasing program	Municipal involvement in the Green Business Club to create a forum for businesses to pursue sustainability initiatives	Creation of 'EnergieLoket' to help businesses improve their energy efficiency	

Food & agriculture

Zuidas is the only development in this study to directly address food as a key theme in its development strategy. In ZIPS, the strategy aims at increasing the awareness of where food comes from in order to promote a healthier and more sustainable food system by increasing visibility. Especially in the city, the main source of food is seen as groceries and restaurants, distancing the consumer from where and how their food is produced (Gemeente Amsterdam, 2011k). This strategy is in alignment with efforts at the broader municipal level under the 'Proeftuin Amsterdam' initiative from 2006-2009 that aimed to promote a healthier and more sustainable food system by creating a regional food strategy for the Amsterdam metropolitan area (Gemeente Amsterdam, 2010e).

As a result of this strategy, Zuidas seeks to allow space for food production by allowing the use of otherwise idle land for agricultural production. Other elements of the strategy are to provide space for the purchase of locally produced food, and improve the knowledge of the food system by offering events and demonstrations in the area. Concepts such as vertical agriculture, rooftop greenhouses, and planting of fruit trees are proposed and already visible in Zuidas, a cornfield has been planted to fill an idle plot that would otherwise not be in development in the near future. Space for markets has been allocated on both sides of the A10 and Amsterdam Zuid train station for the sale of locally or regionally produced foods. There is also space allocated for an experimental agricultural mall south of the station (Gemeente Amsterdam, 2011k). Finally, community gardens are also available in both Beethoven and Ravel for residents to grow their own food products (Gemeente Amsterdam, 2009e).

Food, like production and consumption, is an area where the municipality has little to no authority in ensuring a more sustainable outcome. What it can do is allow zoning laws to be flexible enough to make room for agricultural and other creative uses for land that would otherwise be developed for businesses or housing purposes. From a provisioning standpoint, the municipality provides space for markets and other awareness-building

activities and events. Enabling is accomplished through education and promotion of local and sustainable food and the benefits of creating synergies between the city, landscape, recreation, food production, and health. An example of self-governing is the municipal planting of a corn field in the Zuidas on an otherwise idle plot as a demonstration initiative and the city’s efforts to purchase 40% of catering food needs from biologically certified producers (as part of the purchasing program described under production and consumption).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Planting of a corn field in an otherwise idle and undeveloped plot 40% of products purchased for catering in the municipality are biologically produced	Educating and raising awareness about the food system and the benefits of creating synergies between the city, landscape, recreation, food production, and health	Provision of space for locally and sustainably produced food markets	Allowing temporary agricultural uses in space otherwise zoned for mixed use, commercial, or residential development.

Conclusions

The Zuidas project in Amsterdam offers a good example of a major development project with significant municipal involvement. This involvement is explained by the fact that the Zuidas project is directly linked to the potential for economic growth in Amsterdam and in the Netherlands as a whole. High expectations for Zuidas abound and the jury is still out as to whether it can truly create a dynamic urban center in Amsterdam Zuid without degrading the old historic center. In strategic visions for the city and the Zuidas project, the economy and sustainability are leading themes for the development and time will tell if they can be pursued together or if one will take priority over the other. Municipal planning and visioning only go so far in terms of realizing results, as private investors will ultimately be deciding where to invest their money and the municipality will be in the challenging position of trying to influence outcomes without driving away investors with too many requirements. That being said, the municipality is not shying away from stating its own priorities and exercising its influence. This makes the Zuidas an interesting case to study, providing a case study for how far municipal influence can go towards realizing the sustainable development of its city.

In terms of principles, Zuidas scores well on integration and long-term outlook, while balanced participation and social equity receive less attention. Procedures present more of a mixed picture. There is a clear strategy for sustainability and a strong culture of creating partnerships and networks for sustainability and innovation. While institutionalization seems strong on the surface, with dedicated resources for sustainability at both the municipal and project levels, the challenge is to better coordinate efforts and create consistency between resources working at different levels and across projects. The municipality has struggled to some extent to get good tools in place for the monitoring of sustainability performance. Sustainability reporting remains high level and lacks detail that would allow comparisons between projects. Also, while much emphasis is placed on BREEAM certifications to help gauge the sustainability of the built environment, its use is voluntary and use has been limited to date. If this tool is to remain the main evaluation standard for buildings, the municipality should do more to stimulate and support its use.

Strong municipal planning has certainly had a positive affect on the outcome of the policy-level analysis. Zuidas has clear strategies and policies that position it well in the traditional planning areas of spatial & land-use planning, mobility & transportation, biodiversity & habitat, and water. The municipal ambitions to reduce CO₂ emissions and

make climate neutral buildings the standard have been applied to Zuidas and its scores for energy and waste reflect these efforts. Perhaps most remarkable, is the municipality's willingness to directly engage areas with typically less influence – the policy areas of building retrofits, cultural & historical, health & wellness, production & consumption and even more challenging areas of food & agriculture.

Strategies for existing buildings focus on segmenting the market and negotiating covenant agreements with various groups of owners. The key focus to date has been the housing market, with covenant agreements in place at the municipal-level for both social housing corporations and the rented housing segment. While this is an innovative approach, the key critique is that it is thus far only focused on energy and equity related commitments. A similar approach may also be possible to reach agreements with other sectors (industrial and commercial buildings) and for the improvements of other aspects of sustainability such as biodiversity and greening, water, waste, health & wellness, and so forth. Perhaps further institutionalizing schemes such as 'BREEAM Gebied' or alternatives such as 'GPR Stedenbouw' may help to further broaden this perspective and offer an approach targeted at smaller scales.

Cultural & historical and health & wellness, contribute to the sphere of the area and help to form the identity that makes it an attractive and vibrant place to be. Zuidas has deliberately established an art and culture program with a supervisor who has been responsible for establishing the Virtual Museum Zuidas and developing relationships with art institutes to further cultivate the art and culture scene in the area. Health & wellness is approached in two ways – first, from the perspective of urban design, as keen attention is paid to public spaces and the experience of the pedestrian. Secondly, significant attention is given to minimize the negative effects of noise and air pollution inherent in a dense urban center that will be continually under construction for the coming decades.

Production & consumption and food & agriculture are areas where influence is typically least effective, but yet the Zuidas project has included these areas in their strategy. Production & consumption is approached through efforts to build networks and create collective projects between businesses and other organizations. In addition, the city's ambitious purchasing program goes a significant way to supporting businesses that produce its products and services in a sustainable way. Food & agriculture is approached by trying to increase visibility and awareness of the food system through markets, information campaigns and events, and the visible production of food within the Zuidas areas, whether that be with fruit trees, in greenhouses, or the temporary planting of idle property for corn production. The municipal purchasing program also preferences biologically and locally produced food. At this point, these efforts remain small scale in comparison to the approach for general production & consumption, and therefore food & agriculture receives a lower score than production & consumption.

Some observations can also be made about the role of the municipality in these efforts. Authority is most often used in situations where it is enforcing legal standards evaluated for the issuing of building permits such as EPC energy efficiency standards or the management of surface and rainwater. Other regulations exist for removal of trees and green space, hazardous waste disposal, protection of monument sites, and air and noise pollution levels. Formal spatial planning processes give the municipality control over zoning and new land-use plans can be created to rezone for other uses or enable temporary use of land for temporary markets or other uses such as the planting of agriculture or gardens. Covenant agreements can allow municipalities the opportunity to leverage market access in return for sustainability initiatives.

Provision is often associated with large municipal utilities and services and can be one of the most impactful ways for the municipality to improve the sustainability of large systems associated with energy, transportation, water, and waste. In the case of Zuidas,

sometimes this is in conjunction with private and semi-private utility providers or with other levels of government (especially for transportation and water infrastructure). Notable efforts at improving sustainability through provision in the Zuidas are the provision of district heating and cooling in cooperation with Nuon; the creation of a waste energy company to feed both the district heating system and to provide electricity from waste combustion; attention to sustainability of transportation infrastructure including adequate density of public transportation, consideration for bike paths, and walkways in the street hierarchy, electric vehicle charging stations, and using noise dampening techniques in roadway construction; the improvement of the ecological structure by planting of trees, plants and grass along roadways, in public squares, and canal banks; finally, the provision of space for collective gardens and sustainable food markets.

Enabling becomes important when the levers of authority and provision are either not possible, desirable, or do not go far enough to influence the behavior of individuals, businesses, and other organizations to make sustainable choices. On the one hand, the municipality is enabling when providing subsidies for solar panels, green roofs, and electric vehicles. On the other hand, simply setting strategies, goals and sharing information is a form of enabling. Key efforts of the municipality in this regard are facilitating an integrated heating and cooling strategy in Kop Zuidas, setting targets for CO₂ reduction and climate neutral buildings, promotion of BREEAM standards and associated energy and water efficiency initiatives, setting planning visions and the ZIPS strategy which are discussed with potential investors, participation in networks such as the Green Business Club to help stimulate collective projects such as car sharing, promoting sustainable transportation choices and its potential benefits in terms of health and wellness, promoting waste separation, materials reuse, and recycling, establishing an energy help desk for small and medium sized businesses, promoting cultural events and exhibits, and raising awareness about the food production system and the value of locally and sustainably produced food products.

Self-governing focuses on the efforts that the municipality makes within its own organization to improve its sustainability performance. In some cases, this is to provide a good example for other organizations to follow and in others, such as the municipal purchasing program, the municipality's efforts towards purchasing sustainable products can help keep these companies in business and price competitive with non-sustainable competitors. The Zuideramstel municipal building has been designed for energy efficiency and is equipped with both a thermal heating and cooling system and a green roof that helps it to achieve a 60% CO₂ reduction compared to a traditional design. The municipality is improving its vehicle fleet by purchasing vehicles with superior environmental performance, including electric vehicles and also training drivers to be more environmentally efficient. As a result of the municipal purchasing program, total cost analysis was used to identify bricks as a more sustainable material than concrete for city streets and 40% of all catering food products are biologically produced.

As a result of this case study, it's clear that the sustainability ambitions of the municipality are present in the development of the Zuidas. This is not surprising, since it is arguably the most important development for meeting growth needs in the coming 30 years. This case will now be contrasted to a smaller, but still important area for Amsterdam's future, and in this case it's one more focused on market-led redevelopment.

4.3 Buiksloterham: Redevelopment of the IJ riverbank in north Amsterdam

When looking for area development projects within Amsterdam that are focusing on sustainability, the Zuidas and Ijburg are often cited as the most prominent examples of the sustainable developments. Somewhat lesser known, however, is northern Amsterdam's Buiksloterham, which used a sustainability-based tender process to sell the

development rights for municipally owned properties within the area. While the whole Buiksloterham area is 100 hectares (including water), the municipality is only actively pursuing development in a space of 35 hectares where property is owned by the municipality of Amsterdam (Gemeente Amsterdam, 2011e). A stark contrast to the Zuidas in terms of size and municipal involvement (see Table 4.4 below), Buiksloterham showcases an alternative planning method to the approach taken in the Zuidas.

<u>Development</u>	<u>Size</u>	<u>Previous Use</u>	<u>Municipal-involvement</u>
Zuidas (Amsterdam South)	270 hectares	Commercial/Educational/ green field	High
Buiksloterham (Amsterdam North)	35 hectares active (total area 100 hectares)	Industrial/brown field	Limited

Table 4.4: Comparison of Zuidas & Buiksloterham

At the time of this study, the Buiksloterham area is an area in transition, slowly making the shift from an industrially focused area to a mixed-use urban development. Since much of the development has yet to occur, the focus is on the plans for the future of this area, as opposed to the current situation. Therefore, the case study will elaborate the process used for the sustainability tender and put its affects into context of the greater Buiksloterham area and other developments along the northern IJ riverbank. The analysis will evaluate the comprehensiveness of how sustainability is approached and identify the role that the municipality plays in this effort. Key resources for the analysis include a variety of municipally-published documents, including the city's structural vision, a master plan for the northern IJ riverbank, the land-use plan and environmental impact report for the Buiksloterham area, reports in the city's planning publication 'Plan Amsterdam' as well as interviews with Dimitri Frenken, project manager for the municipality's project management bureau in northern Amsterdam and Marcel Bloemendal, a municipal urban planner working on the Buiksloterham area.

Situated on the north bank of the IJ river, which splits Amsterdam city center from northern Amsterdam ('Amsterdam Noord'), lies a former industrial terrain that has been slowly vacated over time, making room for the prospect of redevelopment into a mixed-use urban area. Redevelopment of the northern IJ riverbank has been on the agenda for almost a decade, as the municipality office of Amsterdam Noord developed a master plan in 2003 for the redevelopment of four specific areas, covering 430 hectares: Overhoeks, Buiksloterham, NDSM, and the Hamerstraat region (see Figure 4.7 below). Notably, the master plan was never approved by the city council due to the high costs for the municipality (especially for ground pollution cleanup). Nevertheless, this master plan laid the foundation for the transition process along the IJ riverbank to begin (Gemeente Amsterdam, 2011i).

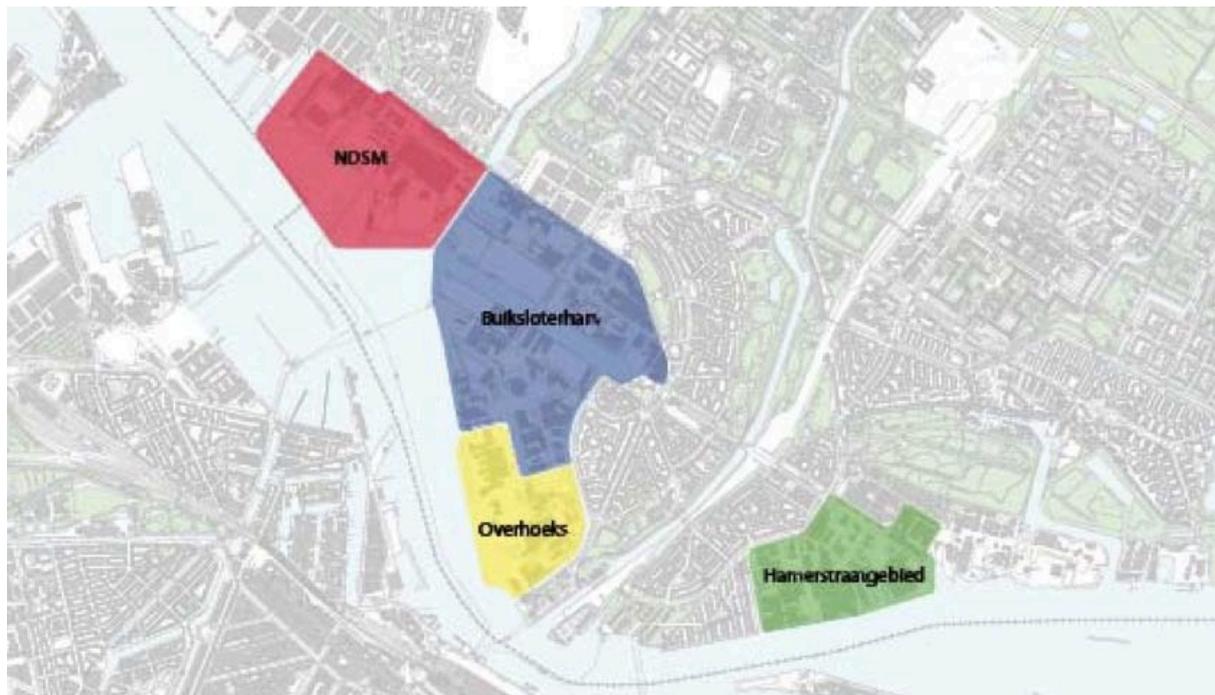


Figure 4.9: Overview of developments in Amsterdam Noord (Gemeente Amsterdam, 2011i, p. 2)

Within each of the four development areas, the approach to redevelopment has varied. The former shipyards in the NDSM-area have been recognized as national historic monuments, preserving the wharf-character of the area. After many of the industrial wharf tenants either went out of business or moved, the area became a hip location for parties and music festivals in the 80's (Gemeente Amsterdam, 2011i). Over time, many in the creative industry became interested in the area and collectively formed the organization 'Kinetisch Noord', to seek funding and redevelopment into the area (NDSM.nl, 2011). The role of the municipality in the redevelopment has been limited, however the municipality has tried to stimulate activity in the area by funding a ferry connection and establishing temporary student housing in shipping containers. As a result, the area has become a popular location for students, artists, architects, industrial designers, actors, producers, media and entertainment companies (including MTV) (Gemeente Amsterdam, 2011i).

Overhoeks provides a significant contrast to NDSM and the approach now in place for Buiksloterham and Hammerstraat. Formerly occupied by Shell Oil, redevelopment of Overhoeks was initiated by private developers ING Real Estate and Ymere after acquiring the land from Shell. In the case of Overhoeks, the municipality took a more active role in the planning for redevelopment. Consolidated land ownership made it possible to redevelop the area as an integrated whole, however much cleanup would first need to take place to rid the area of the pollution leftover from the Shell facility. The municipality worked with the developers to prescribe a detailed urban plan for Overhoeks. The plan specified guidelines and design criteria for the redevelopment that would guide the transition from a former industrial area into mixed residential and commercial use. As a result, Overhoeks is the most planned development in the area from the perspective of the municipality (Gemeente Amsterdam, 2011i).

The approach taken in Overhoeks has provided some important lessons to the municipality, as a detailed plan does not ensure that buyers and tenants in the market will be ready to move in as development takes place. Developers will often wait to secure tenants prior to proceeding with the development process, otherwise they risk not recovering their investment. In this case, the detailed plan provides stricter rules and regulations for development, making it less flexible for potential tenants. The result is a highly planned area with many of the plots remaining undeveloped as a result of the

financial crisis. The outlook has been improving, however the experience with Overhoeks has led the municipality to seek more market-led approaches for other developments (Frenken, 2011).

On the other end of the planning spectrum, the Hamerstraat area is the least planned and most spontaneous area for redevelopment along the northern IJ riverbank. The municipality does not hold any of the land interests in this area and therefore has chosen for more of a facilitation and strategic role. This role plays out in the setting of zoning and environmental requirements as well as ensuring connectivity with public transportation as necessary; stimulation of development is left to the market. As a result, the municipality's expectation for growth and redevelopment in this area is more long-term, with the most ambitions being realized between 2020-2040 (Gemeente Amsterdam, 2011i).

Buiksloterham sits between Overhoeks and the Hamerstraat region in terms of the city's involvement in the planning process. Covering a space of 100 hectares, land ownership in Buiksloterham is divided; various private parties own the vast majority of the land. While some industry still exists or has been converted to other commercial uses, parts of the area are sitting idle after being vacated by its former industrial uses. Like any former industrial terrain, there is much ground pollution in this area that needs to be dealt with prior to redevelopment for either housing or commercial purposes and the high costs associated with the cleanup makes the land less attractive for the city to proactively acquire, especially with the current lull in development resulting from the financial crisis and the experiences gained with Overhoeks (Frenken, 2011). The long-term vision for Buiksloterham is to be developed into a mixed residential and commercial area with the potential for 4000 housing units and 500,000m² for commercial activity (Gemeente Amsterdam, 2009b), however it's clear that the area will be in transition for at least the next couple of decades before it reaches its full potential (Frenken, 2011).

Buiksloterham Sustainability Tender Process

Despite most of the land being privately owned, what makes Buiksloterham interesting for this research is the role the city played in promoting sustainability for four city-owned plots by means of a sustainability tender process. In 2009, the city of Amsterdam organized a tender process for the right to build on these plots (Gemeente Amsterdam, 2009d). In contrast to the common bidding process associated with such tenders that would have market parties competing on price, the tender was to be won based on the sustainability content of the proposed development plan. In order for such a tender to be feasible, the alderman responsible for spatial development, Martin van Poelgeest from the leftist green party 'GroenLinks', agreed to fix the price for the land rights at a level low enough that it would allow developers to invest in more sustainable designs (Frenken, 2011).

The general ambition was to create a process that would stimulate experience with climate neutral building, which the city has set a goal for all new build to be climate neutral from the year 2015 (Gemeente Amsterdam, 2009d). For the Buiksloterham area as a whole, the city would do its part by making district heating available. As the area develops over time, the city would also ensure the sustainability of the public spaces, including the provision of efficient street lighting, appropriate access to public transportation, bike paths, and sidewalks. As for further requirements, the city did not create a list of specifications for bidding parties to meet, but rather left it open to stimulate creativity, stating that the right to build would be awarded based on the overall innovativeness and sustainability of the proposal (Frenken, 2011).

Any developer could participate in the process for any or all of the plots put forth in the tender, however each of the four plots were distinct from the other, requiring a separate proposal for each plot. The selection process was conducted in two stages, a qualifying

round followed by the final selection round. The qualification was based on the developer's vision for the development (not yet the full plan) and their ability to prove organizationally and financially capable of fulfilling the development. The top four parties for each plot would make it through to the second round where they would make a sketch design and expanded description of their proposal (see Figure 4.10 for example designs). The final selection was to be done by a selection committee made up of a panel of experts under the leadership of Jan Terlouw, a former minister and retired member of the Dutch D66 political party. Other members of the panel included the project manager for Buiksloterham, the supervisor for Buiksloterham, an independent architect with sustainable energy expertise (Gemeente Amsterdam, 2009d).



Figure 4.10: Sketch proposals from sustainability tender (from left to right): GTP Vastgoed B.V., TEKTON Architecten and AMIC Installation Consultancy B.V., awarded development of plot 41 (Gemeente Amsterdam, n.d.-b); Vink Bouw and Marcel Lok architect, awarded development of plot 12 (Gemeente Amsterdam, n.d.-c); and Heddes Vastgoed and Deerns raadgevende Ingenieurs, awarded development of plot 21 (Gemeente Amsterdam, n.d.-a)

The evaluation of the final round was based on three factors: 1) a sustainability score for the proposed development, 2) a climate neutral building score and, 3) the translation of the original vision into the design proposal with sketch design. To measure the sustainability, the municipality used the output score from the 'GPR Gebouw' tool ('gebouw' is Dutch for 'building'). To measure the extent to which the building was climate neutral, two tools were used in combination: Amsterdam's own climate neutral building calculation table ('Rekentabel Klimaatneutraal Bouwen') and the 'EPL Quickscan' tool. The final score was a qualitative assessment of the design vision and proposals submitted during the tender process. Table 4.5 provides an overview of how the proposals were scored.

Score	Indicator	Description	Output
Sustainable building score	GPR Gebouw (10 points)	GPR Building is a web-based tool developed by M/E consultants in cooperation with the municipality of Tilburg ¹¹ and is commonly used throughout the Netherlands as way of evaluating the sustainability of a building.	The output of the tool is a score on a 10-point scale for 5 separate categories: energy, environment, health, usability, and future value. The average of the 5 scores is taken as the final score.
Climate neutral building score	Rekentabel Klimaatneutraal Bouwen (9 points)	Amsterdam's climate neutral building calculation table provides a calculation of the energy-savings and sustainable energy production of a building. The output provides a calculation of the energy-savings and sustainable energy production of a building.	Up to 5 points were awarded for energy savings and up to 4 for sustainable energy production.
	EPL Quickscan (1 point)	The EPL Quickscan was developed by the Dutch agency for energy and the environment (SenterNovem) and focuses on fossil fuel savings. The output provides a score on a 10-point scale that includes not only the fossil fuel use of the building, but also of the users, the public space on the premises, parking facilities, and garden or lawn facilities (a score of 10 is the ideal situation where no fossil fuels are in use).	Up to 1 point was awarded for this indicator based on the following table: <ul style="list-style-type: none"> • EPL 10 = 1.00 • EPL 9 = 0.75 • EPL 8 = 0.50 • EPL 7 = 0.25 • EPL 6 = 0
Implementation of sustainability vision in final proposal	Assessment of the submitted proposals from both rounds (10 points)	Qualitative assessment completed by the selection committee	The final proposal will be evaluated based on two factors: <ol style="list-style-type: none"> 1) Consistency with the vision submitted in the qualification round 2) Integration of the various sustainability instruments chosen in the design

Table 4.5: Tools used in Buiksloterham sustainability tender selection process. Created by author based on (Gemeente Amsterdam, 2009c)

The municipality provided access to all tools and the data could all be filled in by the participants themselves and submitted for review by the selection committee (Gemeente Amsterdam, 2009c). These tools were more preferable than the methods from international certifications such as BREEAM and LEED due to familiarity in the local market, the end-user usability, and simplicity. BREEAM and LEED certifications often require much more complete designs in order to meet the specified criteria, however striving for a LEED or BREEAM certification was certainly not discouraged as part of the process (Frenken, 2011).

¹¹ More about the GPR Gebouw tool is provided in the Tilburg case study.

Ultimately, the municipality received approximately 20 applicants for the qualification round and 3-4 applicants were chosen per plot based on the pre-selection qualification criteria. In 2010, the winners for the four plots were announced. The GPR scores for the winning proposals scored between 8.43 and 9.37 and an example output is provided in Figure 4.10 below (Noordwaarts.nl, 2011c). Three of the four developers have gone under contractual agreement to develop the plots as designed and are now in the preliminary design phase and expecting to obtain building permits by March 1, 2012. Unfortunately, the winner with the highest score and also of the largest plot proved not to be financially viable and the plot is being broken up into smaller plots for future development (Frenken, 2011).

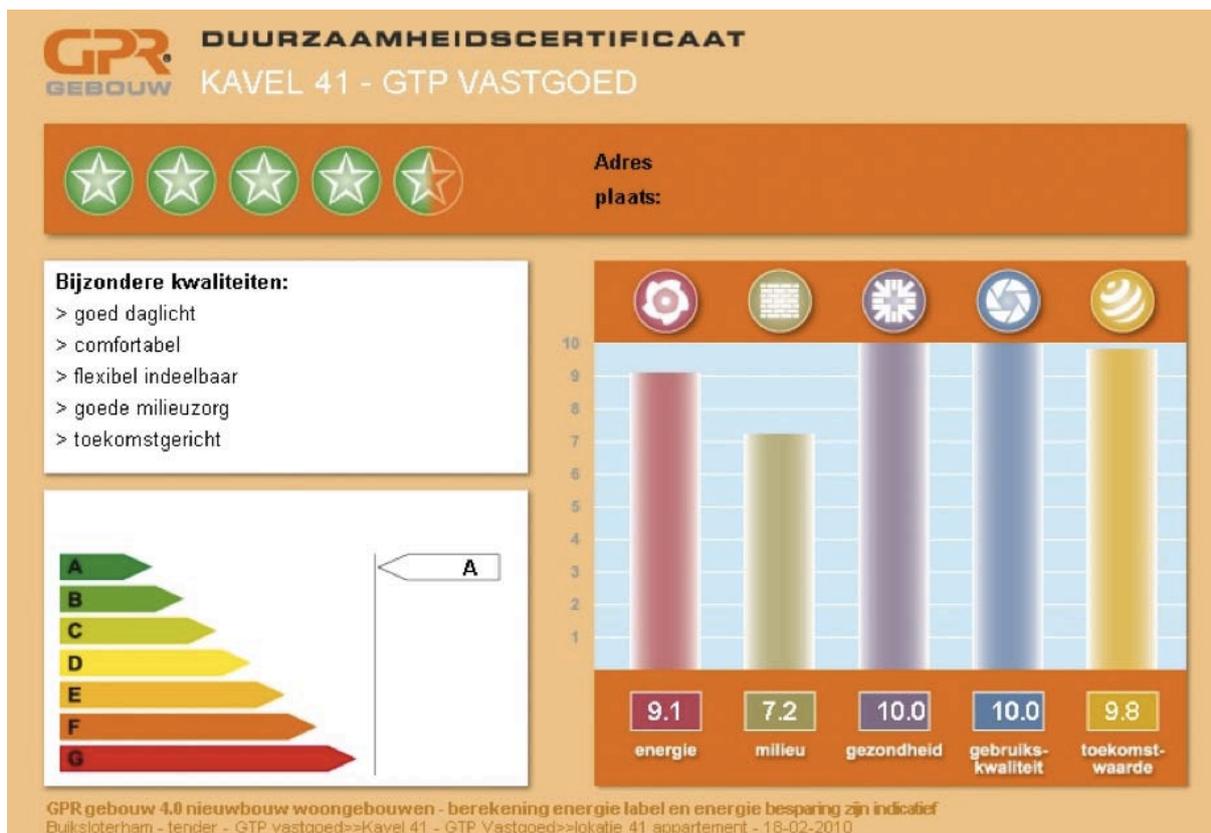


Figure 4.11: Example GPR output from Buiksloterham plot 41 with average score of 9.05 (Source: <http://www.noordwaarts.nl/publish/pages/259931/gtp41gpr.jpg>)

In retrospect, the process proved to be successful in stimulating creativity and innovation in sustainable building design. The process worked because the price was set at a level that was attractive enough to provide competition and encourage smaller and niche developers and architects to participate. Interestingly, most of the large housing and commercial development companies did not participate in the tender process, some having been frustrated by the municipality's unwillingness to add specificity to the criteria or change the process for awarding the tender. With such an open design process this project would be riskier than other more standard processes where they could compete on price and use their standard economical models. Their absence did not negatively impact the process due to having enough bids from other competitors (Frenken, 2011). Also, when asked to compare the development in Buiksloterham to other developments in Amsterdam Noord, the fact that Buiksloterham is made up of many smaller plots makes it easier to stimulate innovation in comparison to a larger scale development such as Overhoeks, where only the largest development companies have the capacity to participate in the process. Smaller plots translate into lower land

prices, which opens up the development to a wider audience of smaller developers that may bring new and creative methods (Bloemendal, 2011).

Development-level Analysis of Buiksloterham

From a comparative perspective, Buiksloterham differs substantially in scale and priority from the Zuidas development. As far as the municipality organization is concerned, Zuidas has a dedicated department to the development, while Buiksloterham is one project within the broader Amsterdam Noordwaarts project bureau along the northern IJ riverbank. Further, the sheer volume of material to evaluate from Zuidas (regular visioning documents, sustainability plan, sustainability reporting, etc.) is a contrast to Buiksloterham or the IJ riverbank as a whole. On the other hand, Buiksloterham is part of the city of Amsterdam and with the absence of project level visioning documents or sustainability reports, the project can still be evaluated to see how well the project embodies municipality-wide goals and ambitions. Nevertheless, when considering the principles, procedures, and policy areas for comprehensive sustainability presented in the analytical framework, it should not be automatically assumed that if the city of Amsterdam holds particular principles of sustainability, those principles translate directly into area development projects such as Buiksloterham. Therefore, only if the city’s vision and efforts towards sustainability surface in the study of Buiksloterham, will credit be given for those elements in the case study. This is done to draw attention to whether the municipality’s own visions and goals trickle down into the implementation of its development projects.

Principles

Principles expressed for area development are often found in Master Plans, land-use plans, and other visioning and planning documents provided by the municipality. Principles are perhaps easier to state than to implement, and therefore rely on procedures to ensure that they are put into practice. Nevertheless, without mention of key sustainability concepts at the principle level, it cannot be assumed that those issues are a priority to the municipality in their development plans. In the case of Buiksloterham, the long-term outlook receives a green rating as sustainability is presented in the context of the long-term structural vision, in which the IJ riverbank and Buiksloterham in particular is a key area identified for urban growth (Gemeente Amsterdam, 2011j). Other principles receive yellow ratings as less is specified directly for Buiksloterham and relies more on the general principles of the municipality. A summary table with the rankings is provided below and followed by an explanation. Principles will be presented in the order of their rating, therefore green ratings will be covered in the explanation first, followed by principles receiving a yellow rating.

Integration	Long-term outlook	Participation	Social equity
			

Principles receiving a green rating

Long-term outlook

Of the four principles listed in the analytical framework, long-term outlook seems to stand out in Buiksloterham. The tender process was framed as an effort to gain experience with climate neutral building to help the city meet its goals of reducing climate emissions by 40% in 2025 and striving for climate neutrality in all new buildings from 2015. Also, the redevelopment of the IJ riverbank as a whole is a key strategy in Amsterdam's structural development vision for 2040 and Buiksloterham is particularly important for the conversion of industrial terrain into a mixed-use working and residential area (Gemeente Amsterdam, 2011j). In regards to the sustainability tender employed in Buiksloterham, long-term value of the building is specifically a part of the GPR Building tool and thus was included in the scores evaluated in the proposal assessment process (GPRGebouw.nl, 2011).

Principles receiving a yellow rating

Integration

An integrated plan for the transition of the area as a whole is lacking. This is in part due to the fact that the Master Plan presented in 2003 was never approved due to the financial risks for the municipality. At this point, the lack of integrated plan is considered intentional, as the municipality is purposefully leaving more of development of Buiksloterham to the market than in comparison to an area such as Overhoeks (Gemeente Amsterdam, 2011i). The hope is that this flexibility inspires creativity and innovation (Frenken, 2011), however it remains a risk to the overall sustainability of the area if integration does not receive adequate attention. On the plus side, integration was a key factor in the qualitative evaluation of the proposals in the sustainability tender, however this was only at the building scale and not for the area as a whole (Gemeente Amsterdam, 2009c).

Participation

Similar to the Zuidas, Buiksloterham provides the standard opportunities for participation as part of the spatial development and planning process. Formal participation procedures for Buiksloterham included dedicated public participation periods for the early planning stages of the project. There was two months at the end of 2004/begin 2005 to provide feedback on the high-level development plan prior to formalizing the plan. This included two information sessions and an participatory evening session to gain feedback from the community (Noordwaarts.nl, 2011b). A similar process was followed for the municipal investment allocation and initial building guidelines for the redevelopment in 2006 (Noordwaarts.nl, 2011a). In addition to these standard opportunities for participation, local businesses, non-profits and residents also have representation in the project sounding/feedback board ('klankbordgroep Buiksloterham'). This allows a representative group to remain involved and give feedback throughout the project (Frenken, 2011).

As for participation in the tender process, the process was certainly designed to remain open to the participation of smaller developers and architecture firms, however participation did not go so far as involving the community in establishing criteria for the evaluation process or to participate or give feedback as a structured part of the evaluation.

Social Equity

Similar to the Zuidas case, social equity is not given much direct attention in Buiksloterham. While the urban plan does state that 30% of the new housing will be

offered as social housing, that is standard for all developments in Amsterdam (Bloemendal, 2011). Further, social equity is not part of the evaluation criteria of the development proposals (Gemeente Amsterdam, 2009b). While some credit was given to Zuidas for indirect influence on social equity, in this case, since the municipality is taking a less active role in the full redevelopment of the area, more is left to the market and any attention on achieving equity may need to come from private organizations.

Procedures

Procedures are important to the implementation of sustainability as it helps to bridge the more abstract principles to the realization of sustainability in the policy areas that follow. Without effective procedures for ensuring sustainability, the principles and vision documents produced at the highest level could end up being nothing more than rhetoric. While the sustainability tender process provides an interesting example of an instrument for promoting sustainability design at the building scale, it is only one tool for doing so and it only accomplishes this at a small scale (only three of the four plots are in the process of pursuing development). In general, the Buiksloterham development lacks a comprehensive set of procedures such as a clearly stated sustainability vision, dedicated resources or sustainability teams, processes for standard sustainability evaluations, progress reports, or other monitoring tools. As a result, no green ratings were awarded to the procedures of Buiksloterham, however a yellow rating is given for the attention that sustainability gets in the land-use plan and municipal-level sustainability initiatives. The category for Instruments & tools is also awarded a yellow for the processes surrounding the sustainability tender. Institutionalization and Fostering partnerships & networks receive red ratings for their apparent absence in the Buiksloterham redevelopment effort. A summary table is presented below followed by a more detailed overview of the ratings.

Sustainability strategy	Institutionalization	Fostering partnerships & networks	Instruments & tools
			

Procedures receiving a yellow rating

Sustainability strategy

While there is no stand-alone document that details the sustainability strategy or vision for Buiksloterham or the broader developing region along the IJ riverfront, information regarding sustainability can be found in Amsterdam’s structural vision (Gemeente Amsterdam, 2011j) and the Buiksloterham land-use plan (Gemeente Amsterdam, 2009b). At this point in the development, it’s too early to tell if the vision at the municipal level in combination with the land-use plan is effective at steering the redevelopment of Buiksloterham in a sustainability-oriented direction. The lack of a clearly integrated sustainability strategy at the development level, combined with the fragmented ownership of the land and a market-driven redevelopment plan, creates the risk that sustainability may take a back seat to market drivers for redevelopment. Currently, with the land-use plan and environmental assessment already complete, the municipality has little leverage with private developers beyond ensuring that minimum regulatory and zoning standards are met in the building permit approval process

(Frenken, 2011; Needham, 2007). Developing checkpoints or steps in the redevelopment process to make sustainability a priority, however, could mitigate this risk. Such a process could be aided if the city made a more specific strategy for Buiksloterham that could be communicated with potential investors and developers.

Instruments & tools

As mentioned above, Buiksloterham primarily provides an example of an interesting instrument to promote the sustainability of area development. At this time, the sustainability tender process has only been used for the four plots included in the Buiksloterham area. While at the time of this research there was no specific plan to use the process again in the immediate future, the city is making it one of the standard processes for land development. This will at least make it available to project managers in the spatial planning department for future development projects in which the municipality is in the position of landowner (Frenken, 2011).

While the land-use plan and the environmental impact assessment could be considered instruments that cover many sustainability-related issues in the area, after these process steps are completed, other instruments and tools focused specifically on promoting sustainability at the development level throughout the realization phase are lacking. Current plans for monitoring sustainability at the municipal level do not focus on the outcomes at smaller scales, such as city regions, neighborhoods, developments, etc (Jonkhoff, 2011).

Procedures receiving a red rating

Institutionalization and Facilitation of Partnerships & Networks

As far as the other procedural aspects are concerned, institutionalization and facilitating involvement in partnerships and networks, Buiksloterham nor the other IJ riverbank development projects offer specific strategies or institutions beyond what is laid out for the municipality as a whole by the climate office, sustainability program, and structural vision. This wouldn't necessarily be a problem if the municipal-level procedures directly engaged the projects at the development level, however that is currently not the case (Jonkhoff, 2011; Stam, 2011).

Policy Areas

The evaluation of Buiksloterham needs to consider the fact that the primary instrument for promoting sustainability in the area, the sustainability tender process, was focused at the building level since each plot would be developed separately. Therefore policy areas that rely on a larger spatial scale such as the whole area of Buiksloterham lie outside of the sustainability tender process and rely on the municipality's approach for the area's sustainable development or the plans laid out in the land-use plan (Gemeente Amsterdam, 2009b). At both scales, it's important to keep in perspective that most of the plans for the policy areas below are dependent on making extensive progress on the redevelopment in order to make a difference. Therefore, a caveat to these scores is that achieving the ambitions inherent in redevelopment is dependent on the market producing enough demand, this is especially relevant for any area such as Buiksloterham where there is fragmented private ownership and relatively small plot sizes.

Green items are those that take priority in the municipality's land-use plan for Buiksloterham and, where applicable, directly addressed in the evaluation of the proposals in the sustainability tender process. Yellow items are those only addressed by the evaluation criteria for the sustainability tender. Since these areas receive less attention in other municipal plans, their impact is limited to the 4 plots included in the

tender process. Red areas are those not addressed in either the development proposals or by the municipality.

A summary table of how the Buiksloterham scores across the policy areas of comprehensive sustainability is provided below. Following the table, there will be a more detailed description of the rating given. New to the policy area analysis will be an additional discussion regarding the role that the municipality is playing while working towards its goals in accordance to the governing modes introduced in the theoretical framework (Alber & Kern, 2008; Bulkeley & Kern, 2006).

Energy	Spatial & land-use planning	Mobility & transportation	Biodiversity & habitat	Water	Waste	Building retrofits	Production & consumption	Food & agriculture	Cultural & historical	Health & wellness

Policy areas receiving a green rating

Energy

Buiksloterham plays an important role in the city’s energy and climate-related goals to achieve 40% CO₂ emissions reductions by 2025 and to have all new buildings be climate neutral from 2015 onward. As a result, the city is requiring that new buildings in Buiksloterham be connected to the city’s district heating system¹², which is supplied with residual heating from the nearby Westpoort industrial area. This requirement will also be called into effect for large-scale building renovations or technical installation upgrades when possible (Gemeente Amsterdam, 2009b). Furthermore, of all policy areas in the tender evaluation process, energy gets the most attention, as it plays a key part of the evaluation criteria for the GPR Building tool, the municipality’s climate neutral building calculator, and the EPL Quickscan tool.

The municipality takes a broad governing approach to energy in Buiksloterham, employing strategies of authority, provision, and enabling. Self-governing is not present due to a lack of significant municipal buildings in the area. With the sustainability tender, the municipality takes a particularly active enabling role for the municipality in stimulating sustainable energy solutions. By investing in district heating and requiring it’s use, the municipality is driving the shift to more sustainable forms of energy supply. A summary is provided in below.

¹² The criteria states more specifically that all newly built buildings must be connected when they are within 40 meters of a connection to the system, or when they are greater than 40 meters but the costs for the connection are no greater than the costs for those less than 40 meters from the connection. Exceptions to this rule are allowed in order not to discourage alternative sustainable energy solutions (Gemeente Amsterdam, 2009b).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Use of sustainability tender to stimulate market parties to come with energy-efficient development plans	Providing access to municipal district heating system with residual heating from industrial areas elsewhere in the city	Requiring connection to District Heating system for new buildings or major renovations

Mobility & transportation

Mobility and transportation improvements are targeted in the land-use plan for Buiksloterham (Gemeente Amsterdam, 2009b), the overall structural vision of Amsterdam (Gemeente Amsterdam, 2011j), as well as the original unapproved Master Plan for the IJ riverbank from 2003 (Gemeente Amsterdam, 2003). For short trips within the area, Buiksloterham will follow the lead of city center Amsterdam by discouraging automobile traffic and making it easy and safe for walking and bicycle travel. Parking must be provided for on the building plots themselves and will not be permitted along the public streets. For longer journeys, the expansion of further public transportation and the improvement of connectivity with the southern bank will of the IJ River will be a priority. Bus infrastructure will be expanded based on the norm that all working and residential areas will be within 400 meters of a public transportation stop. Connectivity will further improve with the addition of a metro station in the area upon completion of the North/South metro line. Also, there are plans for adding a pedestrian/cycling bridge and reserving space for a ferry landing in Buiksloterham (Gemeente Amsterdam, 2009b).

For mobility and transportation, the municipality is able to use all forms of governing. In contrast to sustainable energy, sustainable mobility and transportation are not an outcome of the tender process, but rather through citywide transportation and mobility initiatives. Authority is used through zoning, which establishes regulations for freight traffic through the development, helping to mitigate noise and air pollution. Provision is perhaps the most important role for the municipality for stimulating sustainable mobility, as the provision of alternatives to automobile transportation enables a choice that may otherwise not be an option. Enabling is used in the promotion of bicycle use and the electric car campaign (including the installation of charging stations in the Buiksloterham area¹³). Finally, the municipality’s efforts to green its fleet is an example of self-governing. A summary is provided below.

¹³ <http://www.opdekaart.amsterdam.nl/oplaadpunten>

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Greening of municipal vehicle fleet	Promotion of bicycle use Electric car campaign	Expansion of public transportation network with increased bus stops, adding a metro station with the North/South line, reserving space for a ferry landing, adding pedestrian/cycling bridges Provision of charging stations for electric cars	Zoning changes' affect limiting freight traffic to specific streets to avoid air and noise pollution on smaller streets and in mixed-use areas with residencies Requiring parking space allocation to be dealt with on development plots

Water

Water is often an area of strong importance in Dutch planning and is highly regulated by national, provincial and municipal law. Water also holds special importance to the city of Amsterdam, since it is so characteristic of the city's design. In land-use plans, a water paragraph has been a required section since 2003, wherein topics such as water safety, flooding, sewage, provision of drinking water, health, subsidence, and groundwater quality are all considered in the land-use and development planning. The redevelopment of Buiksloterham into a mixed-use area will require all building sites to be brought up to current regulatory standards, which will result in an improved water quality through ground pollution cleanup as well as better management of surface water through the upgrading of the sewage system and drainage planning (Gemeente Amsterdam, 2009b).

Currently in Buiksloterham, the waterfront property is not open to the public, but rather owned and occupied by the property owners, which have historically utilized the water for shipping purposes. The redevelopment of this area aims to rectify this situation as much as possible by creating public access along the IJ riverfront and with the various canals that crisscross much of the area by renegotiating rights to waterfront as redevelopment takes place. This will allow for the continuation of the riverfront in Overhoeks throughout the Buiksloterham area. Also, recreational potential will be improved by creating public access points for non-commercial boat use (Gemeente Amsterdam, 2009b).

As for the evaluation of the tender proposals, use of water and water efficiency receive direct attention in GPR Building's environmental rating. The rating includes specific consideration for energy saving measures (i.e. capacity-limiting toilets, faucets, and showerheads), water capture and reuse (i.e. separate fresh and grey water systems), and water management (i.e. wastewater and ability to disconnect from sewage system where possible) (GPRGebouw.nl, 2011).

The municipality's approach to governing water is primarily by authority and provision (in collaboration with the public water utility, Waternet), however the municipality also played an enabling role through the sustainability tender. A summary is provided below.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promotion of water efficiency through sustainability tender process	Provision of drinking water and sewage systems in collaboration with water utility (Waternet)	Regulations for water quality, management of runoff, flood safety

Waste

For most purposes, waste is handled the same in Buiksloterham as throughout Amsterdam. As mentioned in the Zuidas case, the current municipal campaign for waste separation has been underway since 2010. Separation is possible for glass, paper, small chemical waste, vegetable, fruit, and garden/decomposable waste, plastic packing material, small electronic equipment, light bulbs, other large waste such as old furniture and appliances, building waste (from construction), textiles, and asbestos waste disposal. While disposal for most items close to home is possible, items such as electric equipment and large waste can be dropped off at central collection sites or by a number of independent second-hand stores making it more feasible for waste items (or at least salvageable parts) to be sold to new users or production facilities (Afval.amsterdam.nl, 2011). Other notable initiatives are the municipality’s efforts include the municipal waste energy company, as mentioned in the Zuidas case, and efforts towards improving the environmental performance of waste collection and processing by upgrading to more efficient vehicles and training its staff in driving more efficiently (Gemeente Amsterdam, 2011h).

For the proposal evaluations in the sustainability tender process, GPR’s Building environmental evaluation tool includes a Life Cycle Analysis (LCA) for the building. Consideration is given for all phases of use – the building, use, and eventual deconstruction. This includes the (re)use of materials for building, the facilities and policies for waste separation, and use of materials that can easily be deconstructed and reused or at least non-polluting when disposed of (GPRGebouw.nl, 2011).

The municipality is again engaged in all forms of governing in the pursuit of improving waste management. Authority is used for regulating proper waste disposal. Provision ensures waste separation collection facilities and programs. Also, the municipality’s creation of the waste energy company provides a means of reusing waste products. Enabling takes place through the use of GPR in the sustainability tender process and the promotion of waste separation. Examples of self-governing are the procurement of environmentally efficient waste collection vehicles and training of staff in environmentally efficient driving techniques.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Investing in waste collection vehicles that achieve higher environmental performance Training of waste collection staff to be more efficient drivers	Sustainability tender process promoting innovative use of materials Promotion of waste separation	Provision of waste collection facilities and programs for separation of waste Municipal waste energy company (AEB)	Regulating for the proper disposal of hazardous waste

Health & Wellness

Noise and air pollution are two key areas where municipal planning policy can have an influence on the health and wellness of occupants of Buiksloterham. The transition of Buiksloterham from industrial to mixed-use area will have mixed results for both air and noise pollution – this is a topic that takes up a significant portion of the environmental assessment report completed prior to the new land-use plan. While the maximum permitted volumes of air and noise pollution has come down with the zoning changes, some of the benefits gained will be countered by increases in noise and air pollution as a result of building activity and increased traffic. The environmental assessment maintains that these levels will stay within legal limits (Gemeente Amsterdam, 2005).

As a key exercise of municipal authority, the conversion of industrial to mixed-use will create more varied demand for the area. From a safety perspective, increased demand in combination with improved lighting in a mixed-use area means that people will be out and about more outside business hours, putting more eyes on the street and reducing the opportunities for illicit behavior. The reclaiming of the riverfront for public use will provide more opportunities for recreation and relaxation (Gemeente Amsterdam, 2009b).

At the building level, health and wellness is considered under the GPR building’s health and usability scores. The health score takes noise, air quality, and comfort aspects (determined by choices in thermal, lighting, and visual design made possible with use of glass, insulation, heating installations, etc.) into account while the usability score focuses on accessibility, functionality, quality of technical installations, and safety (GPRGebouw.nl, 2011).

Zeroing in on the role of the municipality, health and wellness is governed by setting limits for noise and air pollution and improving safety through the provision of lighting installations in public spaces. Again, the sustainability tender is a strategy for enabling the pursuit of improved health and wellness through urban design.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promotion of health and wellness through the sustainability tender process	Municipal lighting of streets, waterfront, and public space	Regulations for noise and air pollution levels Zoning for mixed-use creates opportunities for diversity and vitality in the area

Policy areas receiving a yellow rating

Spatial and land-use planning

The municipality has ambitious plans to convert this former industrial area into a high-density mixed-use urban area (Gemeente Amsterdam, 2011j). This is attractive from a sustainability perspective since the area is centrally located, just north of the current Amsterdam city center. Planning development in this area is an efficient use of urban space and helps to avoid urban sprawl. Nevertheless, spatial & land-use planning receives a yellow mark due to city’s intentional choice to take a passive approach to urban planning for Buiksloterham, leaving more up to the market and perhaps expanding the transition time period as a result (Gemeente Amsterdam, 2011i).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Fixing the sale price of municipally owned land in order to enable the sustainability tender process	Sustainability tender process to facilitate innovation by market parties		Zoning changes to allow mixed-use in formal industrial area

Biodiversity & habitat

Since Buiksloterham is the conversion of an industrial area, the basis for biodiversity and ecological quality leaves much room for improvement. Studies completed for the land-use plan show that the area does not host or directly connect to protected natural areas or host any protected species (Gemeente Amsterdam, 2009b). Due to its industrial past, the quality of the ecology in the area has been negatively affected by pollution – approximately 80% of the soil in the Buiksloterham region suffers from soil pollution (Gemeente Amsterdam, 2005).

The process of redeveloping the area and the inherent cleanup that will be required to bring the lots up to standard will improve the ecological quality. In addition, plans of extending and expanding the public riverfront along the IJ from Overhoeks through the Buiksloterham area creates more of an ecological corridor along the riverfront which can eventually help connect the broader Amsterdam ecological network, the expansion of which is outlined in the Amsterdam-Noord Groenplan (green plan) (Gemeente Amsterdam, 2009b).

Nevertheless, this cleanup of ground pollution comes at a high cost and makes it less attractive if developers need to factor these costs into their financial models. A mass cleanup effort is also too expensive for the city to take the lead, which has led to the passive development strategy for this area, leaving more up to the market (Frenken,

2011). As for the evaluation process for proposals in the sustainability tender process, improving the ecological value would have to be captured in their vision and the qualitative score used to evaluate the implementation of the vision and the integration of sustainability methods.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Sustainability tender process to facilitate innovation by market parties – e.g. green roofs or landscaping	Provision of parks and development/maintenance of waterfront property (once acquired)	Use of building permit process as leverage for renegotiating rights to waterfront

Building retrofits

At the development scale, the plan to redevelop the Buiksloterham does not specifically address the upgrading or renovation of existing buildings for the purposes of increasing their sustainability performance. The four areas included in the sustainability tender process all were based on proposals for new buildings. This is not to say that renovation of existing buildings is discouraged in any way. The new zoning plan allows for the repurposing of existing buildings for new functions, such as creating loft-style apartments and flats from buildings with industrial character (Gemeente Amsterdam, 2009b). At a minimum, any redevelopment projects that include major renovation or repurposing of existing buildings will require building permits, which provides the municipality an opportunity to engage with the development plans and influence that any redevelopment at least meet minimum building standards and fit within the new zoning plan. Also, municipal-level initiatives for improving the energy efficiency in the housing sector would also be relevant in Buiksloterham, albeit to a lesser extent since the area was previously more industrial and commercial than for residential purposes. The details of the social housing initiatives are detailed in the Zuidas case study above and will not be repeated here.

The municipality has used its authority to ensure that the land-use plan will allow the repurposing of existing buildings for other uses. Major renovations will also require building permits, presenting another opportunity for the municipality to make sure that the building is up to the latest standard. Any housing that is under the management of social housing corporations or otherwise part of the rented housing sector may be improved through the housing covenants. The municipality is not actively pursuing other forms of governing for the purpose of improving the sustainability of the existing buildings, as this will be left to the market parties that invest and redevelop the area.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
			Zoning plan changes to allow repurposing of existing buildings for other functions Enforcement of building standards and codes when major renovations require new building permits Covenants with the housing sector to obtain energy labels and improve energy efficiency in existing buildings

Cultural and historical

The Buiksloterham area is not a designated area of cultural-historical importance by the municipality of Amsterdam, which means the demolition and rebuilding of much of the area will not sacrifice its cultural-historical value. Nevertheless, the building guidelines have been designed in order to maintain the character of the area as much as possible, however this only applies to the land owned by the municipality. Wherever possible, attempts will be made to preserve any buildings that are deemed to indeed have cultural historical value (Gemeente Amsterdam, 2009b).

Preservation of cultural and historical heritage is considered as part of GPR Building’s future value score, however this is subjective and relies on what the user (in this case the developer) fills in for the value (GPRGebouw.nl, 2011). Additional consideration is also possible if used in the vision for the building and the qualitative evaluation of that vision’s implementation. Since the proposals were based on new building designs, this had more to do with the building fitting into the area rather than preservation of any existing structures on these plots.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Consideration for preservation of cultural and historical heritage in evaluation criteria for sustainability tender (GPR Gebouw)		Protection of buildings with cultural-historical importance

Policy areas receiving a red rating

Production and consumption

Use of sustainable building materials was covered in the section on waste. From the perspective of sustainable production and consumption, there is no specific consideration

for the Buiksloterham area to be found in the land-use plan or structural vision. In general, Amsterdam is trying to position itself as an attractive location for companies with aspirations of sustainability (Gemeente Amsterdam, 2011a). While not explicitly stated for sustainability, Buiksloterham is to be positioned as an attractive growth area for small and medium-sized businesses (Gemeente Amsterdam, 2011j), which may be attractive for up-start businesses with sustainability goals. The work of the Amsterdam Innovation Motor (presented in the Zuidas case under Partnerships & Networks) could lead to new businesses that would find this area attractive (AIMsterdam.nl, 2011).

Sustainable consumption is addressed at the municipal level directly through its purchasing program and indirectly through hosting events and helping to facilitate independent organizations promoting concepts such as fair trade, socially responsible production, etc. (Gemeente Amsterdam, 2011a), however there is no direct effort to influence this at the area scale within Buiksloterham.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipal sustainable purchasing program	Promotion of sustainable businesses through events and participation in organizations such as Amsterdam Innovation Motor (AIM)		

Food and agriculture

Any direct mention of food and agriculture are absent in the redevelopment plans for Buiksloterham. At the municipal level, Proeftuin Amsterdam was a municipal program from 2006-2009 that aimed at promoting healthier and more sustainable food system through the creation of a regional food strategy for the greater Amsterdam Area (Gemeente Amsterdam, 2010e). After the program budget expired in 2010, these efforts were left to the market and consumer initiatives (Pijnenburg, 2011). While not specific to the development of Buiksloterham, the municipality’s purchasing strategy provides that 40% of catering products are biologically produced (Gemeente Amsterdam, 2010d).

Food and agriculture is an area where the municipality has little influence on the behavior and choices of individuals and businesses. While in Zuidas, Amsterdam had made use of idle property for the temporary production of agriculture, no such initiative was found for Buiksloterham. Efforts at enabling more consideration of the food system were provided with the Proeftuin Amsterdam initiative, however the budget is expired and a replacement program has not emerged. The only example of self-governing is the purchase of biological food products for catering in municipal buildings.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
40% of catering food products are biologically produced	Promotion of sustainable food and agriculture through Proeftuin Amsterdam (ended in 2010)		

Conclusions

Buiksloterham offers an interesting case study for an area where the municipality of Amsterdam can experiment with more of a market-oriented approach to sustainable redevelopment. The municipality got the ball rolling by including many aspects of sustainability in the initial Master Plan and zoning plans for the area. To create an additional stimulus, the municipality used the sustainability tender process to make the selection for developers for the few plots that were owned by the municipality. The realization of these developments may be just enough to attract others to the area that are interested in creating a sustainable urban development, even without the municipality driving the process for the rest of the area.

The principle and procedural strengths of the Buiksloterham development are its long-term outlook for the area combined with gaining experience with an innovative procedural tool, the sustainability tender, despite the fact that there will be limited opportunities to employ the tender again in the area since municipal land holdings are few. Participation and attention to social equity tend to be strengths of spatial planning in the Netherlands in general.

At the policy area level, combining the strengths of the municipality with those of the tender process, Buiksloterham appears to be well positioned to offer its occupants with sustainable energy solutions, a broad selection of transportation options including a solid public transportation infrastructure and a developing infrastructure for charging electric vehicles. The cleanup of ground pollution inherent in redevelopment should improve water and soil quality in the area, albeit on a rolling basis. The municipality's plans to make the waterfronts more accessible will improve the aesthetics and recreation potential of water in the Buiksloterham area as well as offer the potential for ecological corridors to develop along the waterfront.

The weaknesses of the Buiksloterham approach are two fold. First, a lack of procedures and an approach leaving much of the development to the market will limit the municipality's influence on the ability for development to achieve sustainability ambitions and will draw out the redevelopment process over time, delaying the benefits to a period in the future where substantial redevelopment has occurred. Secondly, the area lacks an integrated sustainability vision and the project bureau responsible for the development does not dedicate any specific resources or use any procedures to monitor or report on the sustainability of the area other than those associated with ensuring development meets minimum standards when issuing building permits (the clear exception is the municipality's involvement in the sustainability tender process, however the scale is limited). In general, this would not necessarily be a problem if there were non-government actors that were stepping in to provide these functions, however this research did not reveal any such actors working specifically in the area of Buiksloterham. Perhaps if the municipality played a stronger role in fostering partnerships and networks in the area, they could improve the chances that external actors get involved in promoting sustainability in the area.

At the policy-area level, the area is particularly weak in the promotion of sustainable production and consumption, which includes sustainable food production and consumption. This is not unsurprising, as these tend to be areas that are hard and perhaps controversial to stimulate, since they confront human behavior and consumer choices. Nevertheless, if the strategy engaged the area of Buiksloterham more directly in the facilitation of networks, they may be able to help stimulate these choices indirectly.

As for the role that the municipality employs in this process, a few observations can be made. Authority is used where there is legal backing to do so and is largely made possible by holding up requirements in the zoning plan in combination with the process for issuing building permits. These instruments enable the municipality to at least

enforce minimum standards, which can provide significant improvements simply because the area must now comply to the latest standards for mixed-use and residential zoning, which are generally higher than those for industrially zoned areas. A notable expression of authority is the municipality's requirement that all new buildings and those undergoing major renovations need to connect to the municipal District Heating system.

The literature states that governing by provision in much of the liberal western world is on the decline due to efforts towards privatization (Alber & Kern, 2008; Bulkeley & Kern, 2006), however Buiksloterham still offers many examples of such provision. Notably, partnerships are made with private companies in order to make the provisions – such as those with local energy companies and utilities. In Buiksloterham, provision efforts ensure that more sustainable options are available, especially in the case of providing district heating, accessible public transportation, water and sewage systems, waste collection facilities and the use of this waste to provide energy from the waste, public lighting, and public space (parks, waterfront, squares, etc.) When the provision of these services is done in a sustainable way, this has the affect of ensuring that sustainable options are available.

Provision, however, does not ensure their use in all cases, which is why the municipality also engages in enabling individuals to make more sustainable choices. The sustainability tender is a means of stimulating more sustainable building design that was only made possible by fixing the price at a level that would allow more investment to be spent on the building innovations. Its use offered the potential to enable efficient energy, water, biodiversity, waste, and healthy design choices. In addition, campaigns at the municipal-level for promoting the use of non-automobile transportation, sustainable food and consumption, and the participation in forums such as the Amsterdam Innovation Motor help to enable more sustainable products and services.

Chapter 5: Tilburg - Spoorzone

Tilburg, with 204,000 residents, is the 6th largest city in the Netherlands and 2nd largest outside the Randstad area. Situated in the south of the Netherlands in the province of Noord Brabant, it is neither the capital nor the largest city in the province. Together with neighboring cities Breda, Den Bosch, Helmond and Eindhoven, the region is one of the strongest economic regions in the Netherlands after the Randstad. Tilburg's roots are in the textile industry, however its expansion in other industries such as chemicals, food processing, medical technology, and fine metal made it one of the most important industrial centers in the Netherlands. After a period of industrial decline in the 1960s and 1970s, the city looked for a new identity. Tilburg is home to Noord Brabant's largest university among other institutions of higher education, making education one of the city's largest employers. Commercial distribution and logistics also play a large role in the Tilburg economy, as it is well situated between the Randstad and Antwerp, Belgium and between the Randstad and the German Ruhr area. With one of the country's most reputable hospitals located in Tilburg, the health care industry is also a major player (Dormans & Lagendijk, 2009).

The chapter that follows will be very similar to the previous chapter on Amsterdam, however with only one case study focused on the Spoorzone development project. The chapter will begin by giving an overview of sustainability-related activities taking place at the municipal level and will be followed by the detailed analysis of the Spoorzone project according to the analytical framework.

5.1 Tilburg's municipal-level efforts towards sustainability

Contrary to Amsterdam, Tilburg's efforts towards sustainability have grown up from a climate-focused program. Tilburg does not have a published sustainability strategy at the municipal level; therefore insight into the strategic priorities of the city will be taken from the structural vision for spatial and economic development. The structural vision will be taken in two parts, first for the published vision for the year 2020 and secondly for the current planning taking place for a new structural vision for 2040. Following the structural vision discussion will be an overview of Tilburg's climate initiatives, its efforts towards sustainability reporting, and its development and use of the GPR building evaluation tool.

Structural Vision for 2020

"Tilburg, city of contrasts" is the main theme for the structural vision put forth by the municipality of Tilburg for the year 2020 (Gemeente Tilburg, 2005b). The contrast is presented as the tension between the dynamic character of the city center and the relaxed atmosphere of the neighborhoods and villages in the surrounding area. The taller buildings and areas of higher density in the city center stand in contrast to the spacious and green surrounding areas. As a mid-size city in comparison to Amsterdam and Rotterdam, Tilburg is positioned as having many of the advantages of a big city, with more of a small town atmosphere (Gemeente Tilburg, 2005b).

Key to any structural vision is to sketch a future state that solves or at least improves issues that the city is currently dealing with. In the case of Tilburg, the outer regions of the city are becoming busier, causing problems of congestion and making accessibility more of a challenge. There is not enough variation in housing options, with a proliferation of options at the mid-level and a shortage of options for those looking to upgrade from mid-level towards more expensive housing. According to the structural vision, these emerging problems may lead to negative effects for the attractiveness for both new residents and businesses. Finally, Tilburg seeks diversification of its economy, too much emphasis remains on the industrial sector instead of emerging creative

industries or innovations that could be developed in cooperation with the Tilburg universities (Gemeente Tilburg, 2005b).

The ambition is to meet these needs by further developing the contrasts already present in Tilburg, ensuring that development accentuates the differences between city center and the surrounding area. Like many cities in the Netherlands, expansion is sought first through intensification and renewal of already built areas, thereby preserving the ecological and recreational qualities of the natural environment that would otherwise be negatively affected by unnecessary sprawl. The municipality maintains that development will not be permitted if it will diminish the ecological structure of the city (Gemeente Tilburg, 2005b).

Unlike Amsterdam, sustainability is not an explicit theme in the structural vision of the municipality. However, the vision does cover many aspects related to sustainability that can be analyzed as to whether or not sustainability is being promoted *implicitly* if not explicitly. In particular, themes discussed in the structural vision are those such as improving the condition and use of the natural environment in and around Tilburg, the city's expansion and its effect on cultural and historical qualities, mobility and transportation and their effect on accessibility both within the city and connecting to the greater region of Provincial Noord Brabant, availability of housing (in this case the need for more options for wealthier residents), and improving the attractiveness of the local economy (Gemeente Tilburg, 2005b). Without specifically framing these issues as sustainability issues, they still have an impact on the sustainability of the city area. More critical analysis of the structural vision and other initiatives of the municipality will be discussed later in the assessment of sustainability at the municipal-level for Tilburg.

Planning for 2040

Approved in 2005, the vision for Tilburg in 2020 is already a bit dated. The city has since begun an initiative to look further into the future, looking ahead to the year 2040 and specifically engaging the community in the process of developing the vision. The first phase took place between 2009 and 2010. In this first phase, participant groups set out to identify trends emerging in the city and to identify the strengths and weaknesses of Tilburg in relation to the trends. The groups were made up of representatives from social, educational, health, and cultural organizations, as well as youth representatives and representation from the private sector (Tilburg.nl, 2011c).

Five key trends were identified as a result of the first phase: borderless, encounter, sustainable, working together, and lifelong learning (Gemeente Tilburg, 2010a):

- 'Borderless' represents a diminishing need for people to maintain place-specific bonds. Social networks can be maintained from a distance and more than ever people are seeking out an ideal place to live where they can also meet other needs for study, work, recreation, etc. On the other hand, transportation is cheap and people will live where they are comfortable, so long as they can easily access everything they need or want.
- 'Encounter' is about the new and changing ways that people encounter each other made possible by digital communication and the virtual world. No longer do people need to meet at the same point in time and space. Opening up more opportunities for finding others with similar interests.
- 'Sustainable' is framed as more sustainable production and consumption, the shift in energy sources and decentralization of energy supply, sustainability requires technological, economical, and social innovations, which are not only for the benefit of the planet, but more than ever an opportunity for the economy and profit.
- 'Working together' puts emphasis on the changing ways of people and organizations working together brought on by increased cooperation between

increasingly flexible forms of organization. Networks come together to work on a project and disband when no longer needed. Individuals can work as independent freelancers, creating more flexibility to address upcoming market needs.

- 'Lifelong learning' is a necessary response to the other trends. People are living longer and therefore working longer. Flexibility demands new ways of doing things and the ability adapt to the new situations. Education and training no longer has to be place-specific, with opportunities for learning increasingly available in the virtual world upon demand.

From these five trends, the second phase of the process will identify a 10-year agenda for municipal leadership and the community, putting the city on the right path for 2040. The agenda will be divided into 8 themes: 'the attractive city', 'the sustainable city', 'the secure and responsive city', 'the working city', 'the knowledge city', 'the regional city', 'the safe city', and 'the caring city' (Tilburg.nl, 2011c). An action plan has been created to develop these themes further throughout 2011. The end of 2011 is targeted for the development of the associated action agenda (Gemeente Tilburg, 2010a).

While the results of this effort are not yet available, it can be seen that sustainability is emerging as an increasingly important theme for the municipality of Tilburg. Together with the structural vision, emphasis is placed on a variety of sustainability themes crossing the full spectrum of policy areas in the comprehensive approach to sustainability in this research. What seems to be less clear is how the municipality is able to implement these visions and whether or not there are procedures in place to ensure sustainability is directly considered throughout the development process. In the following two sections, three such procedures will be discussed in particular: first is the institutionalization of the city's climate strategy in the climate community, second is the municipality's efforts to take a baseline measurement of the sustainability of the city in cooperation with Telos research institute for sustainability from the University of Tilburg, and third is the city's development of the GPR Building tool to help assess the sustainability of buildings in development projects. Following these topics will be a more complete analysis of the municipal-level approach to sustainability.

Tilburg Climate Strategy & Climate Community Concept – 'Klimaatschap'

The municipality of Tilburg has been actively pursuing energy and climate-related initiatives for many years. In 2006, the municipality began to structure its pursuit of climate-related policy and started a process of stakeholder engagement as well as commissioned two studies: 1) a back-casting study to create a roadmap and timeline projections for becoming carbon neutral; and 2) an adaptation scan to assess what steps were necessary for the city to become climate-proof (Hazebroek & Schneider, 2010).

Laying the foundation for a municipal climate program

In the back-casting study, it was determined that 'business as usual' could lead to a carbon neutrality by 2090, however if a 'pull out all the stops' program for carbon reduction was put into place, that target could be reached before 2045. The roadmap was created to meet that goal – reaching carbon neutrality by 2045 – and prescribed actions such as zero energy buildings; production of solar, wind, and biomass power; thermal storage systems for heating and cooling; innovative funding schemes; and concepts for new energy services (Hazebroek & Schneider, 2010).

The adaptation scan, based on four climate scenarios developed by the Dutch Meteorological Institute (KNMI), revealed the potential climate-related impacts to Tilburg, such as consequences (and opportunities) from more intensive rainstorms and warmer/drier summers and winters. While most climate impacts are often thought of as negative (such as increased flood risk, water quality issues, drought, urban heat island (UHI) effect, additional demand for cooling of buildings), there could be positive

economic impacts for example increased opportunities for heat storage and solar energy or economic opportunities for tourism and leisure industries with the increased warm temperatures in the summer time (Hazebroek & Schneider, 2010).

These two studies were then used to create dialogue with various stakeholders in the Tilburg municipal area. Two local climate conferences were held - in December 2006 and October 2007 - in which various stakeholders considered what the local implications for climate change might mean to their organizations and groups were formed based on the interest of the participants. These groups would provide the basis for what would later become the alliances in the climate community ('Klimaatschap'), a multi-actor network organization created with the ambition to steer Tilburg's community towards climate change mitigation and adaptation - essentially setting the goal for carbon neutrality and climate resiliency (Hazebroek & Schneider, 2010).

The municipal climate program and the formation of a climate community (Klimaatschap)

In 2008, the municipality of Tilburg published its first climate program for the years 2009-2012. This program is focused on laying out the steps that can be accomplished over a short time period of 4 years that will guide the city towards its long-term goal of being climate neutral by 2045. With consideration for both mitigation and adaptation measures, the city has put forth a program that relies heavily on collaboration with both public and private parties external to the municipal government. To facilitate this collaboration the municipality sought to assemble public and private parties together in the further development of the climate community ('Klimaatschap'), which became organized into strategic alliances based on the themes identified during previous climate conferences: sustainable energy services, energy efficiency in the housing sector, health and climate change, water and climate change, behavior change, climate and spatial planning, sustainable companies and business area development, and municipal buildings and installations (Gemeente Tilburg, 2008b). A diagram showing the structure of the Klimaatschap and alliances is provided in Figure 5.1 below.

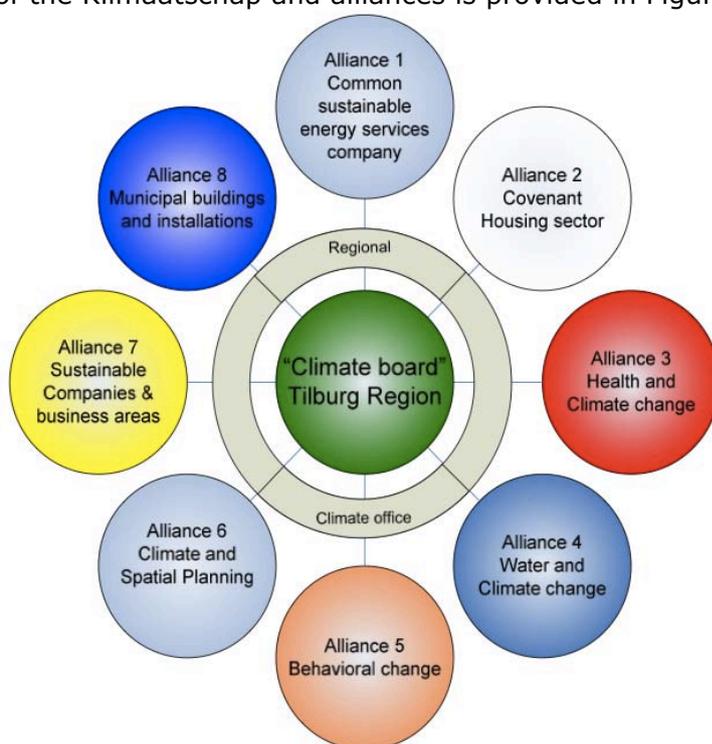


Figure 5.1: Organization of Tilburg's multi-actor network organization: Klimaatschap (Hazebroek & Schneider, 2010)

Participation in the Klimaatschap is voluntary, however to participate, the organization needs to:

- Adopt the mission's goals of becoming climate neutral and climate proof
- Actively participate in at least one of the eight alliances
- Make a financial or natural contribution to the climate community organization

Funding for setting up the Tilburg climate program and the Klimaatschap has come from various resources and has required significant commitment from the municipality itself. To set up the program, the city invested between 2-4 FTEs for several years for program management and hired in other consultants and experts to supplement the municipal staff. Funding sources came from the municipal budget, national subsidies (BANS and SLOK), EU programs (SAVE and CONCERTO) and a Dutch national climate change research program (CCSP) where Tilburg was deemed a 'hot spot' (Hazebroek & Schneider, 2010).

Klimaatschap: creating a network-organization

The goal for organizing the Klimaatschap is to be network-organization independently organized by its participants, where the municipality is only one of the many actors involved. This would require the participants to elect a board of directors, which would then provide oversight to a regional climate office that assumes responsibility for the coordination and is supported financially by the member organizations (Hazebroek & Schneider, 2010).

Such organizational structures or 'governance models' are discussed in the academic literature on network governance, which was consulted in the design of the Klimaatschap concept. According to this literature, a key decision when forming such a governance model is to determine how this network will be governed or steered. The choice is between a 'participant-governed' network, a 'lead organization-governed' network, or a 'network administrative organization' (Provan & Kenis, 2007). A 'participant-governed' network is the simplest form, with network members sharing responsibility for the governance of the network, which can be accomplished either formally or informally. A 'lead organization-governed' network is where governance is appointed in a centralized manner to a leading organization – requiring the organization to have enough resources and legitimacy to gain the trust of the other organizations. Finally, a 'network administrative organization' is a separate entity that is set up specifically for the purpose of governing the network (Provan & Kenis, 2007).

Ultimately, the design of the Klimaatschap would take form with a regional climate office coordinating the network in the role of 'network administrative organization' and under supervision of the participant-elected board of directors (i.e. intentionally not led by the government) (Hazebroek & Schneider, 2010). However, in order to get things started, the municipality of Tilburg's newly formed climate office would take on this role and put the municipality in the role of 'lead organization', developing the network to a point where it could be a self-sustaining entity and no longer require it to be government-led. At the time of this research, an external position has been filled for the direction of the Klimaatschap alliances, thus the transition is underway however the municipality is still very much in the lead (Biemans, 2011).

Launching a sustainable energy service company (MOED)

In addition to the Klimaatschap organization, the municipality has also started working on a concept for stimulating energy and sustainability projects in the central Noord Brabant region. In 2009, a concept was proposed for a central Brabant development organization for energy and sustainability ('Midden-Brabantse Ontwikkelingsmaatschappij voor Energie & Duurzaamheid', abbreviated as 'MOED'). The goal of this organization

was to stimulate large-scale sustainable energy projects, however it was a bit uncertain as specifically what role this organization would play: a knowledge broker, a business developer, or an energy supplier. Therefore in early 2010, the neighboring cities of Waalwijk and Goirle partnered with Tilburg along with other local sustainable business practitioners to investigate the role that MOED could play in realizing large regional projects for solar, wind, and thermal heating and cooling and how the organization would be organized (Gemeente Tilburg, 2011d).

As a result of this dialog, it was decided that MOED would also take form as a network-organization and should take a 'business stimulating' approach, fulfilling the roles of knowledge broker and project leader. As a knowledge broker, MOED plays the role of the connector, efficiently and effectively connecting the (technical, process, legal, financial, and communication) knowledge to the business organizations that have the capability to develop products and services to help meet goals of climate neutrality. As project leader, MOED ensures that climate-related goals are integrated into area (re)development projects and facilitation of the creation of tangible business plans for sustainable energy concepts. As with the Klimaatschap, the desire is for MOED to be an organization external to the municipality, however whether that be a completely new organization or under a preexisting organization remained uncertain (Gemeente Tilburg, 2011d).

In March of 2011, the Tilburg municipal government issued a memorandum establishing a one-year project leadership position with the goal of developing the MOED concept further while laying the groundwork to move the MOED organization under the Midpoint Brabant organization as soon as possible (Gemeente Tilburg, 2011d). Midpoint Brabant is a regional economic network organization made up of government, business, and knowledge institutions with the purpose of stimulating social innovation in the central Noord Brabant geographic area. Currently, Midpoint Brabant has four key industries with which it works: recreation and tourism, logistics, health care, and aerospace and maintenance (Midpointbrabant.nl, 2011). The hope is to make sustainable energy another industry focus. Tilburg will take the lead in this process, however Waalwijk and Goirle and perhaps also Midpoint Brabant will contribute hours to the effort. Further decisions as to the municipality's role in the development of MOED would be made once this year comes to an end (Gemeente Tilburg, 2011d). Currently, things are moving in the right direction for MOED, as the project leadership position has been filled and brought under the organization Midpoint Brabant as planned (Biemans, 2011).

Looking ahead at the time of this research, a combination of uncertainty and opportunity await. The city's climate program was to be the first of many, with the first program being budgeted through 2012 and the expectation that a successor would follow. However, current restructuring within the municipality organization has created some uncertainty around its future and there is no current proposal for a new climate program beginning in the year 2013. On the other hand, Tilburg has received €790,000 in national funding from the Dutch ministry of spatial planning (VROM) under its 'Innovation program for climate neutral cities' ('Innovatieprogramma Klimaatneutrale Steden', IKS). Tilburg was awarded these funds for the innovative concept of the Klimaatschap network organization for which 70 businesses and institutes have already signed a declaration and joined up since its creation. The IKS funds are to be used for the further development of the Klimaatschap concept and are available from 2011 and 2014. This funding also extends the life of municipal climate bureau and provides significant funding for the MOED organization through 2014 (Gemeente Tilburg, 2011e).

Restructuring the municipal organization

In regards to the municipality's restructuring, the municipality is in the process of reorganizing and consolidating its primary departments. A notable change is that environmental department will cease to exist as its own department in the municipality, instead falling under a broader spatial department that is being created to pay attention

to all spatial development and environmental issues (Biemans & Kint, 2011). Since the current restructuring effort is not yet finalized at the time of this research, only a concept diagram of the new organizational structure can be provided (see Figure 5.2 below).

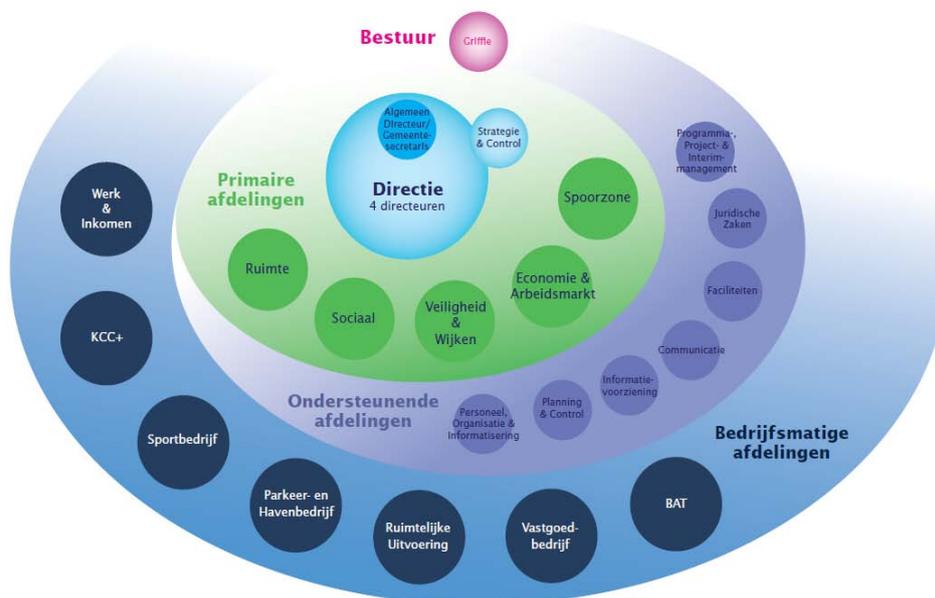


Figure 5.2: Concept organizational model for the reorganization of the municipality of Tilburg (provided by Biemans & Kint, 2011)

The new spatial department is in the green circle with the label 'Ruimte', with the other primary departments being social, safety & neighborhoods, economy and labor market, and the Spoorzone redevelopment project. The next ring represents the supporting departments: personnel, planning & control, information services, communication, facilities, legal, and program & project management. In this diagram, it is not clear where the climate office or climate dedicated resources will fall. Perhaps this is intentional, considering the plan to shift the coordination of the Klimaatschap and the climate bureau to an external organization, however that didn't necessarily mean that the focus on climate and a climate-dedicated resources at the municipal-level would go away when that happened. Nevertheless, that transition is still in progress and in the meantime the coordination will remain the responsibility of the municipality of Tilburg and paid for with the IKS funding mentioned above (Biemans & Kint, 2011).

The municipality has proved quite innovative in its approach to its municipal climate program. By setting out to create a network organization for the management of the climate program and a sustainable energy service company, the city is embarking on the state of the art of both organization and implementation of climate policy. Unfortunately, much of the work that has been done is at risk and the program's future remains uncertain. Only time will tell if these initiatives are successfully transitioned to external organizations prior to being discontinued by the municipality. On the other hand, sustainability is rising in priority in the structural visioning process for 2040, which may give these programs new life and even expand the climate-based efforts to a broader and more comprehensive sustainability approach. Having a good understanding of the current sustainability of Tilburg will provide a good foundation if such a program were to emerge, therefore the focus on the next section is Tilburg's sustainability balance, a baseline measurement of sustainability in Tilburg conducted by the TELOS institute.

Sustainability Balance – ‘Duurzaamheidsbalans van Tilburg 2010’

The sustainability balance represents a key initiative of the municipality of Tilburg in cooperation with Telos, the Brabant Centre for Sustainable Development, to create a baseline measure of its current sustainability status. Unlike the municipality of Amsterdam, Tilburg has not yet tried to produce a sustainability report on an annual or semi-annual basis, however this process may lead in that direction. From a monitoring perspective, this study is a snapshot in time that can serve as a baseline for comparison as the city expects to continue this process on a regular basis. It is expected that this study could be repeated every 2-3 years, however an agreed upon measurement interval was not available at this time (Biemans & Kint, 2011). What follows is an overview of the data presented in the report, which will give an indication of the current status of various sustainability themes according to the research completed by Telos.

Telos is a network-organization affiliated with the University of Tilburg, the province of Noord Brabant, and PON: Centre for applied social research in Brabant. The sustainability balance (‘duurzaamheidsbalans’) is based on the Telos method, which has also been applied to other cities as well as provinces, including Tilburg’s province of Noord Brabant. The Telos method employs the three capitals approach of ecological, social, and economic capital at the highest organizational level in their framework. This allows for a comparison of the balance between the three capitals to see if one of the capitals is getting more attention at the expense of the others. Together with representatives from the municipality, 18 categories were identified and organized under the three capitals, each category containing various indicators for measurement (Zoeteman et al., 2011). Table 5.1 below provides an overview of the three capitals and the associated categories.

Ecological capital	Social capital	Economic capital
Soil and ground quality	Social and economic participation	Labor
Air and noise quality	Political participation	Knowledge (higher education, research, and innovation)
Surface water	Art and culture	Conditions for attracting corporate investment
Nature and landscape	Health	Economic structure
Natural resources	Safety	Infrastructure and accessibility
Energy and climate	Housing and housing conditions	
	Education (up to high school)	

Table 5.1: Tilburg-specific sustainability categories for measurement in the Telos method (translated from Zoeteman et al., 2011, p. 17)(translated from Zoeteman et al., 2011: 17)

Normative benchmarks were determined collaboratively and specifically for Tilburg for each of the indicators. The process included reviewing policy documents, making comparisons over time, comparisons between different cities, and discussions with the community; difficult and often political choices had to be made during this process, which was undertaken together with the municipality. Perhaps unsurprisingly, the balance of the study tips in favor of economic capital (52%), with social capital having the second-highest level of development (41%) and ecological capital coming in third (38%). The percentages reveal the percent that the capital is developed towards its potential according to the defined normative benchmarks laid out in the study (Zoeteman et al., 2011).

Within each capital, there are clear front-runners and 'problem children' among the categories or particular indicators. Notable front-runners are knowledge and infrastructure (economic capital), health (social capital), and energy and climate (ecological capital). What follows is an overview of how Tilburg scores in each of the three capitals.

Ecological capital

The most notable standout under ecological capital is the category for energy and climate. Positive indicators are due to an increase in residences connecting to the city's district heating system and an energy-efficient public lighting system that is only expected to improve with the planned transition to LED lighting. Two indicators have received scores at the highest level, however this seems to be a bit misleading. For housing, gas use has declined, leading to a high score, however another category, electricity use, is on the rise. For business, the opposite is true. Rather than reducing overall energy use, it seems that users are expressing a preference for gas or electricity-based energy, however a different preference is chosen when considering residents as opposed to businesses. The reason for this is not given in the report. Finally, the indicator for sustainable behavior, based on a survey regarding individuals' efforts at saving energy is relatively low. With no available benchmark for this indicator, it will be important to track how this trends in the coming years.

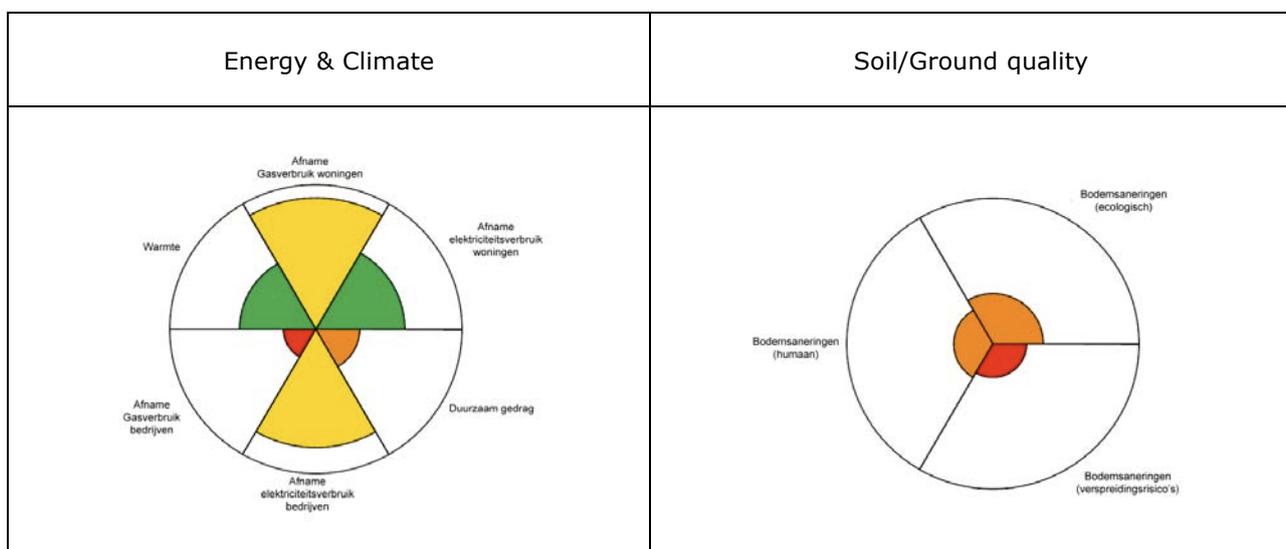


Figure 5.3: Comparison of Tilbrug's best and worst category diagrams for ecological capital (Zoeteman et al., 2011)

The rest of the categories under ecological capital are more concerning, with the category for soil/ground quality receiving the lowest marks on the whole, but areas of air and noise pollution as well as natural resource quality, which is defined in this case as

water quality and waste. This is largely attributable to the city’s industrial history and the related pollution that remains. The city’s immediate focus in the coming years is to clean up those areas that pose unacceptable human or ecological risk. In other categories, specific indicators that stand out with low scores including the inability to deal with surface water runoff as a result of intense rainstorms, water supplies are being used at a rate faster than naturally replenished, water quality at deeper levels is not good, poor scores for increasing quantities of waste and limited reuse of waste products, there is a lack of ecological areas and corridors that connect them, which results in sparse/isolated natural areas. Surprisingly, despite all of these concerns, when surveyed, 78% of visitors find the area attractive.

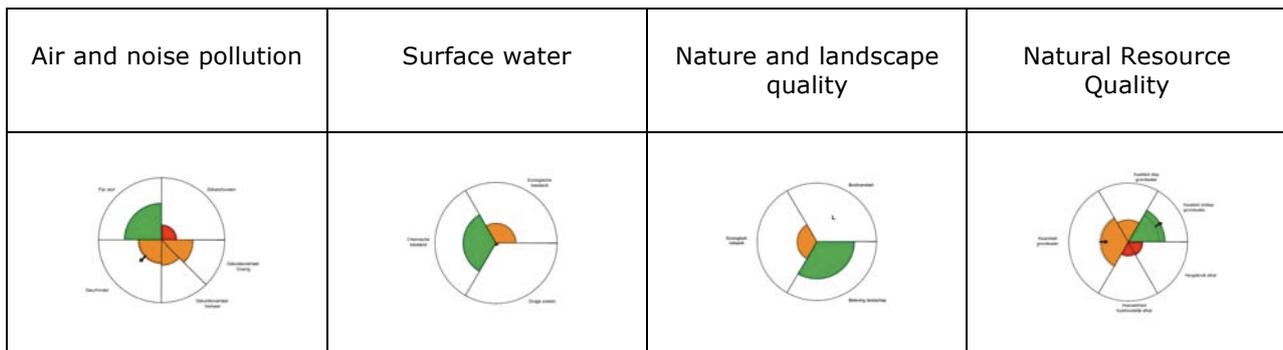


Figure 5.4: Tilburg’s remaining ecological capital category diagrams (Zoeteman et al., 2011)

Social capital

For Tilburg, social capital is all about assessing the social/economic balance as well as the accessibility of the political participation process. The goal is to create equal opportunities for all citizens, freedom, provision of services, and a healthy and safe environment. In terms of health, Tilburg scores the highest. Good scores are reported for the indicators of life expectancy, provision of primary care physicians, self-assessment of health, and participation in risky behavior. Mental/psychiatric health scores average but is trending towards good and the only poor score is for the relatively low percentage (39.8%) of residents that engage in weekly sporting activity. Another category moving in the right direction is social and economic participation, where despite mostly average scores for all the indicators except participation in volunteer work (which scores good), nearly all are trending towards a good score.

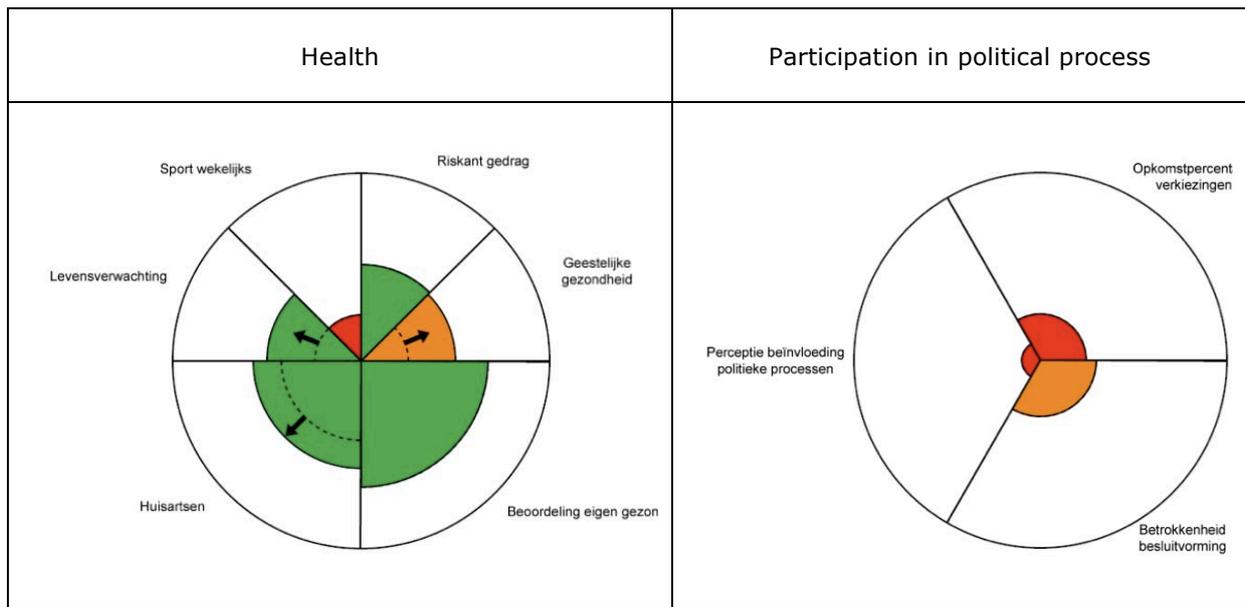


Figure 5.5: Comparison of best and worst category diagrams for social capital (Zoeteman et al., 2011)

The most concerning category is participation in the political process. 90% of surveyed residents feel that their influence over municipal policy is limited or very small. 49.5% of the population participates in political elections, compared to an average of 54.48% in the province of Noord Brabant. Perhaps consistent with this finding, 48% of residents consider themselves either fairly or quite interested in local politics. The other categories – availability of art and culture, safety, availability and quality of housing and the housing environment, and the education system (through high school) – have varying indicator scores within each category ranging from poor to good, painting an average picture of performance. In comparison with the provincial Telos study for Noord Brabant, Tilburg’s social capital is 41% developed towards its potential, whereas Noord Brabant is 51% (Mommaas et al., 2011).

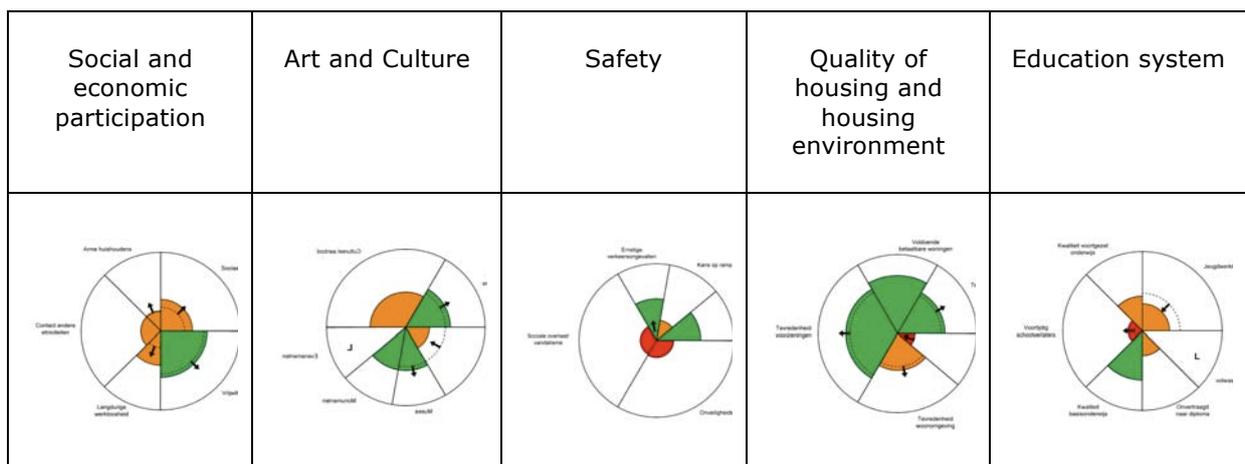


Figure 5.6: Tilburg’s remaining social capital category diagrams (Zoeteman et al., 2011)

Economic capital

Knowledge received positive marks due to local institutions of higher education, a relatively high and growing proportion of residents that have received higher education (36.3%), and growing creative industries (art and culture, media, entertainment, architecture, design, fashion, etc.) Infrastructure received relatively high marks due to the auto-accessibility and flow of traffic in comparison to national averages. However, an interesting finding is that the satisfaction of the accessibility of the inner city in general is relatively low and declining largely due to a declining satisfaction of the auto and bus accessibility of the city center. Accessibility of public transportation in general only gets average scores for the whole Tilburg area. A future indicator suggested by Telos is to create an aggregate indicator of multi-modal accessibility (which would also include accessibility via water/canal in addition to other forms of personal and public transportation); information for this indicator was not readily available at the time of the study.

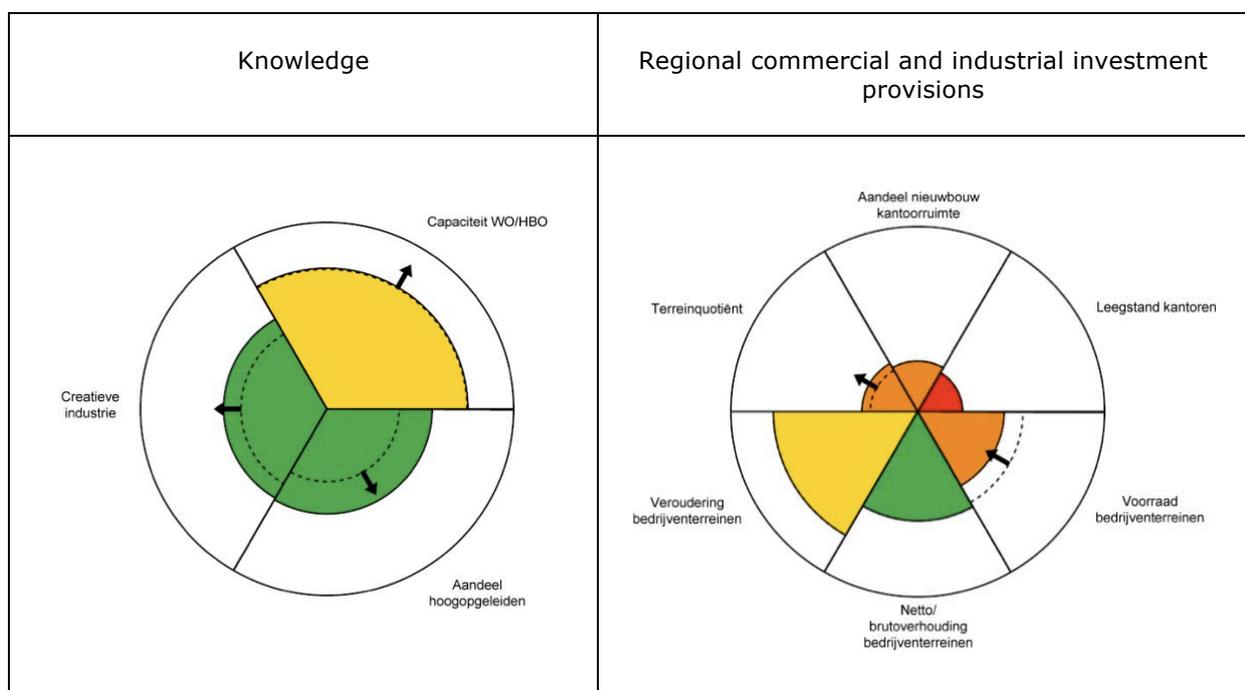


Figure 5.7: Comparison of Tilburg’s best and worst category diagrams for economic capital (Zoeteman et al., 2011)

The results of the indicators in each of the economic categories came out quite mixed, making it more difficult to identify whole categories that are struggling as opposed to particular indicators. Therefore, the concerning economic indicators for the city of Tilburg are:

- A high percentage of the labor force that is deemed unfit for work due to some form of incapacity (6.7%)
- The combination of a high quantity of unfilled office space (17.3%) and a relatively low percentage of newly built or under construction office space as a percent of the total office space availability (21%) – possibly a consequence of the former
- A declining availability of industrial space for new or expanding industries
- A low gross city product per resident (€24,169) in comparison to the province (€35,573) or the country (€36,254)

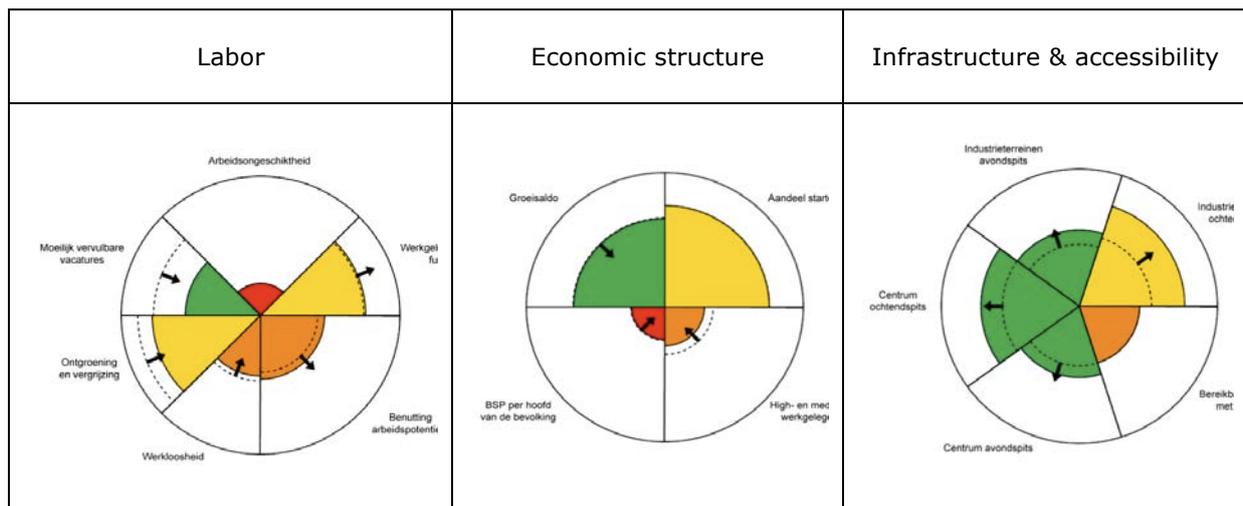


Figure 5.8: Tilburg’s remaining economic capital category diagrams (Zoeteman et al., 2011)

In conclusion, the sustainability balance provides a well-rounded picture of the state of sustainability in Tilburg. The three capitals approach used by Telos promotes a more balanced approach for analyzing the sustainability of a city than for example WWF’s One Planet Living Principles, the principles found in the Aalborg Charter or the Melbourne Principles, which all put more emphasis on environmental sustainability. In comparison to the theoretical framework from this research (which is based largely on the examples listed above), more categories were developed for social and economic sustainability to balance environmental categories. On the other hand, the framework developed for this research does include criteria for participation, social equity, and health & wellness, which broadly cover the areas given more attention by the Telos method. Missing from the Telos method is attention to policy areas of production & consumption and food & agriculture.

In comparison to the sustainability reporting done by the municipality of Amsterdam, this method lends itself more to regular measurements and the tracking of progress over time, whereas the Amsterdam method was more a descriptive summary of projects and initiatives taking place to promote sustainability in the city. Perhaps this list is more comparable to the indicators that were developed for the Zuidas development in the sustainability plan (Gemeente Amsterdam, 2008). The problem with Zuidas was indeed the resources required to continually monitor and report on the indicators that were developed. As a result, the indicators were never followed up upon (van Eijk, 2011). At the municipal-level, Amsterdam has since turned to a more simplified approach to indicators, trying to limit the total number to remain manageable on an annual basis (Jonkhoff, 2011).

The question remains for Tilburg as to how they plan to proceed with measuring this data. Are they going to measure these indicators at a regular interval and track progress over time? If so, can they accomplish that within the municipality or will they need to rely on an ongoing relationship with Telos in order to do so? These questions remain open for discussion within the municipality, as the environmental department and those involved in the research see opportunities for its continuation, however there is nothing approved or budgeted for this purpose at this time.

Gemeentelijke Praktijk Richtlijn Duurzaam Bouwen (GPR)

While the Klimaatschap is an example of institutionalizing sustainability organizationally and the Sustainability Balance is a reporting tool, the municipality of Tilburg has another procedure, in this case more of a practical tool, that it uses in order to help assess sustainability of new buildings. Developed by the municipality of Tilburg in cooperation

with W/E consultants, 'GPR Gebouw' (Dutch for building) is intended to be an integrated and simple software tool to aid the building design process and to ultimately improve the sustainability of the built environment. The tool is designed to not only look at energy or material performance, but also how it is designed to fulfill the function of the users over the long-term, minimizing environmental and health impacts (GPR, 2011).

GPR is different than other sustainability-focused schemes for the built environment such as BREEAM or LEED in that with BREEAM and LEED, an organization must go through an extensive application process with the intention of the building ultimately being awarded a certificate for meeting specified design and process criteria. In the case of GPR, a user can spend just a couple of hours filling out the software tool and based on the inputs, the project is then scored on a scale of 1-10 across various themes such as energy, materials, health, user quality, and long-term value. In order to assign a score, the tool has been designed based on Dutch legislation and regulations like the Building Performance Act, the Energy Performance of Buildings Directive (EPBD) and European NEN-norms (GPRGebouw.nl, 2011).

In practice, GPR Building is used by both market and government parties. If the tool is used during the design process, the user can see feedback in the scores as he/she makes changes to the inputs (for example by choosing different materials or materials that are specifically sustainably produced), therefore helping the user to understand how the design choices effect on the output score. In the planning stages of a project, it can help guide the process of bringing various stakeholders together to come to a mutual agreement on the ambition of the building project. The ambitions can then be used as an input into the software to show how well the project meets the ambition level. An example of the output is provided in Figure 5.9 below.

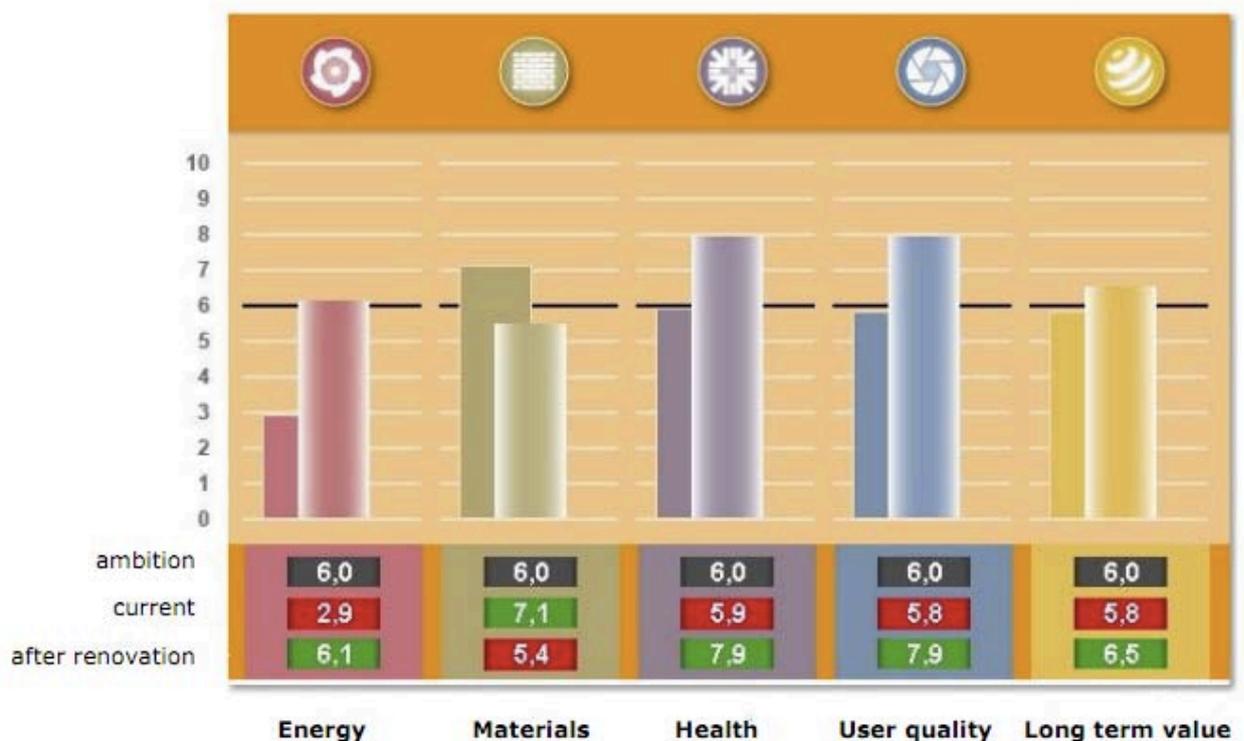


Figure 5.9: Example output of GPR for a building project (GPR, 2011)

The city continues to make use of this tool by incorporating the output scores in their requirements for area development, for example by setting a normative level of 7 for all categories for new buildings (or in the case of Spoorzone, setting 7 as the minimum score for each module and striving for higher scores wherever possible (Gemeente Tilburg, 2007). By using GPR Building the city can track the progress that building is making towards more sustainable urban form. In 2009, 74% of new housing build met the municipally set norm of an average GPR score of 7, in the previous four years only 41% of new housing build met the norm (KlimaatbureauTilburg.nl, 2010).

Initially, the focus of GPR was on the design of new buildings with the GPR Gebouw product, which has later been updated to also assess buildings going through renovation. Also, like much like BREEAM and LEED, GPR is being expanded with different applications, 'GPR Onderhoud' for evaluating building maintenance decisions and for 'GPR Stedenbouw' to evaluate the design of larger urban area developments.

Tilburg's involvement in municipal networks

Tilburg is member to several national and international networks – ICLEI's Cities for Climate Protection (CCP), Eurocities, Klimaatverbond (which automatically makes them a part of Climate Alliance and Energy Cities networks), and the EU Covenant of Mayors. In the creation of the Tilburg climate program, the CCP program was mentioned as having been influential, as Tilburg participated in several meetings with other cities as they shared their climate mitigation and adaptation strategies. The value in being involved in the other networks is on the one hand to help build the city's international reputation for having an ambitious climate program, and on the other hand to come in contact with interesting partners, especially within Europe. The hope is that with by staying active in these networks, Tilburg is well connected to participate and take advantage of European initiatives, projects, networks, and perhaps most importantly, European funding (Biemans & Kint, 2011; Gemeente Tilburg, 2008b).

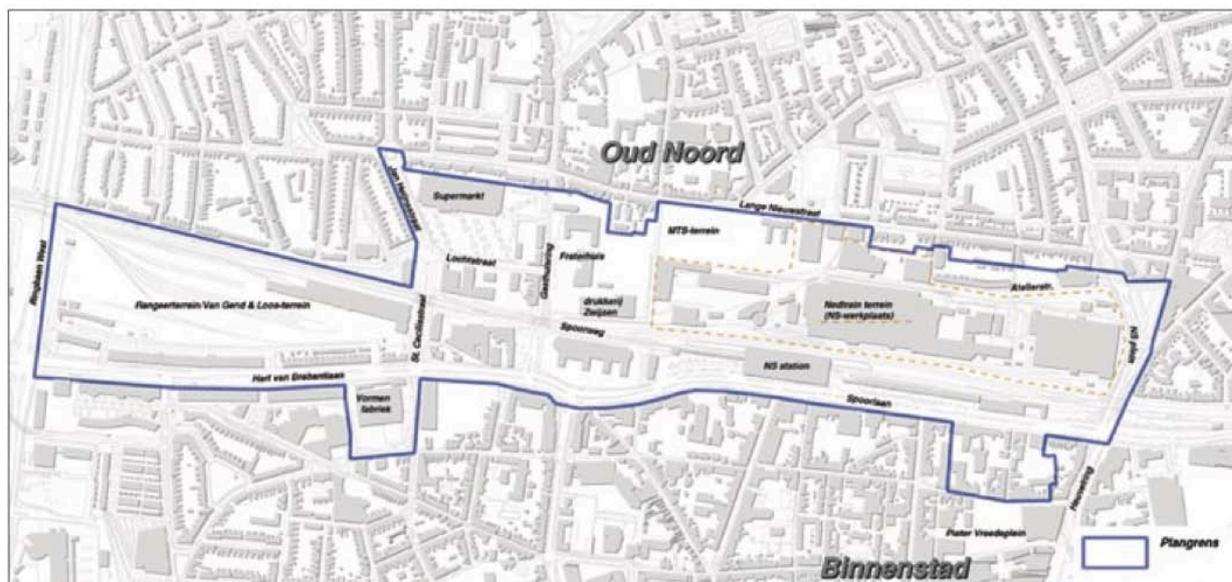
Sustainability in Tilburg Area Development: Introducing the Case Study Analysis

The climate program for the municipality of Tilburg is both ambitious and innovative. Its strengths appear to be in innovative organizational models and the institutionalization of the program through procedures, such as use of the GPR evaluation tool. For the time being, the climate program remains institutionalized through the climate office and the climate community, however it's future is uncertain as restructuring within the municipality is underway and plans to externalize the climate program have not yet been realized. Nevertheless, the climate program has initiated a flurry of activity resulting in climate related projects and initiatives at the municipal scale. Sustainability is also rising on the agenda, with the new structural vision in the early planning stages, interest around broader sustainability is emerging. The question is whether or not these developments are also visible at the area development scale, which presents an interesting opportunity to test the implementation and integration of Tilburg's climate and sustainability ambitions.

Considering that Tilburg is less than a quarter the size of Amsterdam, there are fewer projects to choose from looking for a good candidate for comparison and inclusion in this research. Many of the developments outside the city-center are single-purpose projects, either for the expansion of commercial or residential areas and with limited mixed-use development. Within the city-center, the Spoorzone redevelopment is the most important development project to the city and is a key example of the full-scale conversion of previous uses into a mixed-use urban development. As it is the most important project, it serves as the best example to test how climate and sustainability-related ambitions at the municipal-level, translate to the project-level scale.

5.2 Case study: Spoorzone - Expanding the city center through Brownfield redevelopment

The Spoorzone has been on the municipal agenda since the city's structural vision for the area surrounding the central train station from 1992. In 2003, the plans were made more concrete through the creation of a new master plan for the city center, leading to a structural vision for the 65-hectare Spoorzone area in 2005 (Gemeente Tilburg, 2005a). Near the end of 2007, the development potential for the area was significantly increased when the national train system (NS) announced the relocation of its 13-hectare rail yard and maintenance center (an area henceforth referred to as 'De Werkplaats') from its current location on the northeast side of the train tracks to another industrial property further outside the city, turning over the land to the municipality (Gemeente Tilburg, 2008a). The vision is to transform this former industrial space into a mixed-use area for offices, educational facilities, libraries, restaurants, stores, housing, green and public space in order to increase the areas attractiveness for the knowledge economy and integrating it into the dynamic city center. Currently, Tilburg's city center is located south of the train station and the station is itself oriented to the south, with the railway acting as a barrier to the northern part of the city. Therefore the redevelopment plans to significantly expand the city center and improving connectivity to areas north and south of the railway (Gemeente Tilburg, 2011a).



Plangebied Structuurplan Spoorzone

Figure 5.10: Map of the Spoorzone area (Gemeente Tilburg, 2011a)

'De Werkplaats' (indicated on the map with a dashed line just north of 'NS station') will make up the core of the Spoorzone redevelopment project and receives the most planning attention due to the municipal ownership of the land. In contrast, the property in the middle and western portions of the Spoorzone is privately owned and more of a market-led development approach is being pursued. At the time of this study, the project has completed much of the planning processes and finalized its selection of a project developer, VolkerWessels, to lead the build phase. A couple of market-led residential and student housing buildings are already in development in the middle and western sections of the Spoorzone, however the railway facilities in 'De Werkplaats' are currently in the process of moving and the land will not be turned over to the possession of the city until the end of 2011 (Kuijsters, 2011).

Tilburg's Spoorzone development shares some similarities and has some contrasts with the projects in Amsterdam. First, like Zuidas in Amsterdam, the Spoorzone is considered

the top priority development in the city's broader spatial planning and development initiatives, and this is further evidenced by having a separate and dedicated department within the municipality to work on the project. Holding the position of the most prominent development in the municipality also translates into a more proactive planning approach for these developments. Especially for 'De Werkplaats', the municipality has a direct voice in constructing the image of the new development and on the outcome of how the space is to be used. There is significant documentation produced such as structural visions, updated land use plans, and Master Plans published by the municipality in which the municipality articulates its vision for development. Arguably, Zuidas experiences this at an even larger scale with the fact that it holds national level importance in terms of economic growth. Tilburg, in contrast, holds more of a regional geographic importance, but even still can't really compete with regional economic power Eindhoven, with its position as a technology hub and home to one of the nation's leading technical universities as well as multinational Philips. Tilburg is looking instead to develop its reputation from a historically industrial city to one based on the knowledge economy and leveraging the local educational institutions to do so.

While Zuidas is geographically on the southern end of the city and trying to become a second city center to the historic inner city, the Spoorzone is more of an expansion of the existing city center across a geographical barrier. Framed in this way, it shares some similarities with the Buiksloterham and its neighbors along the northern IJ riverbank in Amsterdam. Buiksloterham has the challenge of integrating across the IJ in the same way that Tilburg is trying to erase the barrier of the railway separating the new development from the historic city center south of the rail station. It's important that such an expansion does not compete with the existing city center, but rather complement and expand on it. From a planning perspective, the western and middle portions of the Spoorzone development (the areas beyond 'De Werkplaats') share a similar approach to development as Buiksloterham, leaving more to the market and receiving less planning attention from the municipality. That said, more attention for this analysis is paid on the planning for 'De Werkplaats', since that is receives the most attention in the planning documentation as well as in the interview with the Spoorzone project director. Another similarity between Buiksloterham and Spoorzone is the use of the GPR Gebouw tool to assess building proposals. Since the GPR Gebouw tool is endorsed at the municipal-level in Tilburg, it actually has more potential for impact than just the four plots that used it in the Buiksloterham development. A more detailed discussion of this tool and other instruments will be presented under the procedures heading below.

According to the master plan for 'De Werkplaats', this redevelopment embraces the city's ambition to be climate neutral by 2045 as well as a broader sustainability perspective that includes aspects such as closing cycles of waste, materials, and energy as well as improving livability and wellness opportunities for those living in the city (Gemeente Tilburg, 2011a). By analyzing the aforementioned municipal planning documents and conducting an interview with the Spoorzone project director, the development-level analysis that follows will put this ambition to the test and explore to what extent the development is positioned to achieve comprehensive sustainability and how the role of the municipality changes for the different policy areas.

Development-level analysis of Spoorzone

The framework for the analysis will again be the comprehensive sustainability list developed and used for the other case studies in this study. The analysis will begin at the more abstract level of principles, where the project's integration, long-term outlook, participation, and social equity will all be evaluated. Principles will be followed by procedures, which provide the link from principles to the implementation of policies and projects across the complete list of policy-areas. Here, four categories will be investigated: the project's strategy for sustainability, institutionalization, the project's

efforts to develop partnerships and networks, and the instruments and tools that are available and used to influence and monitor sustainability. Finally, 11 policy areas will be investigated to see whether or not they receive specific attention at the project-level and what approach is taken in order to do so. The 11 policy areas are energy, spatial/land-use planning, mobility/transportation, biodiversity/habitat, waste, building retrofits, food/agriculture, production/consumption, cultural/historical, and health/wellness.

In terms of the analysis of principles, procedures, and policy areas within the development of the Spoorzone, the municipality’s framing of climate-related issues is a leading theme. While sustainability in the broader sense does not receive the same attention as climate, the municipality is in fact busy with programs that address the wider sustainability scope. Combine the fact that the Spoorzone is the city’s leading development project and receives significant municipal planning attention with the geographical position of the project in the city-center, the municipal-level activities hold significant importance for the Spoorzone development. Therefore, if the project-specific sources do not specify any detail regarding to the analysis, the municipal-level approach will be considered and applied to Spoorzone unless there is a specific reason not to do so. This stands in contrast to the approach used in Buiksloterham where a more market-led planning approach reduced the influence of the municipality on the outcomes of the development. Consistent with the other case studies, a green, yellow, and red rating will be used to assess the performance within each category.

Principles

The leading principles for the case of Tilburg’s Spoorzone are integration and long-term outlook. The municipality tries to use the three capitals of ecological, economic, and social capital to balance the decision-making process, which helps to emphasize the integration and the tradeoffs between the different capitals (Gemeente Tilburg, 2011a). The Spoorzone project is framed by a long-term planning horizon of more than 25 years, putting decisions in perspective over the long-term. Participation and social equity both receive yellow ratings, as specific considerations for improving upon standard participation processes are absent and accounting for social equity in the Spoorzone plans is minimal. Below is a summary of the principle ratings, followed by a more detailed analysis.

Integration	Long-term outlook	Participation	Social equity
			

Principles receiving a green rating

Integration

The municipality is using an integrated approach when it draws attention to the connections to its decisions within and across environmental, economic, and social themes. A consistent theme in the planning documents for the Spoorzone is the positioning of environmental initiatives in terms of the economic feasibility and social opportunity (Gemeente Tilburg, 2008a, 2011a). For example, energy initiatives are not

only good for reducing CO₂ emissions and climate impact, but they also can have positive social and economic impacts as well. Efficiency measures reduce costs over time, reducing the amount of money spent on energy needs. Clean energy initiatives can spur innovation and the economy. In addition, by engaging social housing companies in a covenant agreement for energy efficiency, the municipality is making these improvements possible to the people who can least afford to make the physical investments needed to bring down their energy consumption costs (see policy area 'building retrofits' below for more detail regarding the covenant agreement). By taking this approach, the municipality is looking across the three major themes of sustainability to find a balanced approach.

The design of the GPR Gebouw module used by the municipality is another example of integration. By contributing to the development of a broad tool that measures energy, environment, usability, and future value, the municipality helped translate their vision for sustainability to the users of the system evaluating designs for the built environment. In this case the user can see how choices in one category change the scores in the other categories. This allows the user to better understand the tradeoffs in building design choices and can be used to facilitate a discussion on an effective integrated approach (GPRGebouw.nl, 2011).

Long-term outlook

Inherent in sustainability is that the decisions are considered over the long-term, so as not to prioritize short-term outcomes over those further in the future. The planning horizon for the Spoorzone project is more than 25 years, with full redevelopment not complete until 2030-2035. Coupling this planning horizon with municipal climate goals for climate neutrality and climate proof by 2045 and decision tools such as GPR that place an emphasis on future value, a system is created for putting decisions into a long-term perspective. Of course the short-term issue that gets perhaps the most attention is economics. High costs of pollution cleanup has persuaded the city to limit this cleanup effort by avoiding building and digging underground as much as possible, affecting the ability to implement a more natural water management system in 'De Werkplaats' (see policy area 'water' below for more detail). Keeping a long-term perspective is a balancing act, as the project may not succeed at all if the costs are too high, therefore its hard to criticize such a decision from only the environmental perspective when there are tradeoffs either economically or socially.

Principles receiving a yellow rating

Participation

Public participation has been institutionalized in Dutch spatial planning processes, however whether that leaves enough room for participation early on in the plan forming or whether or not this input has considerable affect on the final plan is debated (see Chapter 3). In the case of the Spoorzone, the environmental assessment report and the preliminary land-use plan provided opportunities for public feedback and discussion in 2007. While only five written letters with feedback were received, a relative large number of discussions were held to gain feedback as input to the land-use planning process (Gemeente Tilburg, 2008a). In addition, neighborhoods bordering the Spoorzone have organized to represent their citizens and provide feedback to the proposals and plans, with the neighborhood of Theresa just north of the Spoorzone taking a particularly active role (Bd.nl, 2011). On the other hand, these are fairly standard processes and there were no specific participation initiatives that really went above and beyond the norm.

Social equity

Framing the project in terms of the benefits for social equity is present, however not a main theme in the development of the Spoorzone. For example, it is stated in the land-use plan that developments in the Spoorzone can improve the social and cultural services offered in the northern region of the city, which have been identified as needing expansion (Gemeente Tilburg, 2008a). On the other hand, there is no specific detail in the land-use plan or master plan documents regarding the housing program and what percent of the housing will be made available for the social housing sector. Equity is a theme that could benefit from additional emphasis.

Procedures

Procedures are important for bridging the principles established below to influencing the outcomes in the policy areas that follow. Tilburg and the Spoorzone development score well in the area of procedures. The approach taken at the municipal-level to establish a multi-actor Klimaatschap has led to a culture that values partnerships and networks. In addition, there are a number of instruments and tools used or promoted by the municipality in order to evaluate the performance of the choices being made and to influence decision-making. Both of these items receive green ratings. Tilburg has a strong sustainability strategy at the municipal-level and that is currently in the process of being translated to the Spoorzone project, however it is not complete at this time. Had this information been available, perhaps the rating could have come out green, however without such a clearly defined strategy at the project-level, its not possible to assume everything laid out at the municipal-level would be carried over to the Spoorzone project. Institutionalization also receives a yellow. This is largely due to the fact that the project is lacking formal connections to the municipal-level climate initiatives at the project steering or within the project organization to ensure that there is alignment at the project level. There is also some uncertainty that exists at the municipal-level regarding the future of these programs. Below is a summary table of the procedural ratings, followed by a more detailed analysis.

Sustainability strategy	Institutionalization	Fostering partnerships & networks	Instruments & tools
			

Procedures receiving a green rating

Fostering partnerships and networks

Key to the Klimaatschap concept developed by the municipality are the various alliances made up of actors from governmental, business, and other private organizations. In the case of the Spoorzone project, all of these alliances relate in some way to activities in the Spoorzone: the alliance for sustainable energy services, the covenant with the social housing sector, health and climate change, water and climate change, behavioral change, climate and spatial planning, sustainable business parks and sustainable businesses, and municipal buildings, installations, and transportation. These alliances provide a natural forum to engage a diverse set of actors with their topic-specific issues of the Spoorzone development. There involvement has already been engaged for

discussions surrounding a sustainable energy service company (alliance for sustainable energy services), the creation of functional green space (alliance for health and climate change), thermal heating and storage installations (alliance for climate and spatial planning) (Gemeente Tilburg, 2011b). In addition to the climate alliances, partnerships are being sought in particular with the local educational and knowledge-based institutions for creating new facilities in 'De Werkplaats' (Gemeente Tilburg, 2011a).

Instruments & tools

Tilburg is known nationally for its role in developing the GPR Gebouw tool for evaluating the sustainability of a building development. From a planning perspective, the municipality encourages GPR Gebouw while planning for developments and a score of 7 or above is encouraged for each module. This tool is used in collaboration with national EPC (energy performance rating) standards to encourage sustainable and energy efficient buildings (more detailed provided below in policy area energy). Also, environmental profiles and energy balances are being made for smaller sections within the Spoorzone that will provide minimum quality standards and area ambitions for each section (Gemeente Tilburg, 2008a).

Other key instruments used by the municipality are the covenant agreement and subsidies. The municipality has used covenants to guarantee agreements with the major social housing companies in Tilburg to ensure adequate social housing and to encourage energy efficiency improvements to the current stock of social housing – relevant for both the middle and western portions of the Spoorzone (Gemeente Tilburg, 2011b). Municipal subsidies have been provided to stimulate energy efficiency, socially responsible businesses, ground pollution cleanup, as well as subsidies for various cultural and wellness related projects (KlimaatbureauTilburg.nl, 2011; Tilburg.nl, 2011a, 2011b).

Procedures receiving a yellow rating

Sustainability strategy

In terms of the Spoorzone project, the Master Plan identifies the ambition for the project to help the city meet its goals for energy neutrality and states that a vision regarding sustainability is in development. While this vision was not ready for review for this research, it is clear that the Spoorzone is giving attention to sustainability, however in the Master Plan, the use of the term sustainability is more limited than the full comprehensive list used in this study – sustainability is only used in the master plan in the context of energy, green space and biodiversity and in regards to the sustainability and viability of economic investments (Gemeente Tilburg, 2011a). For the municipality of Tilburg, the climate program and the three capitals approach (economic, ecological, and social capital) offers a broader approach to sustainability. This is also materialized in alliances and associated projects that cover all aspects of sustainability covered in this study (albeit to varying extent). In the absence of a clearly defined sustainability strategy for the Spoorzone, it remains to be seen how clearly the project will try to articulate a strategy with a broad approach to sustainability.

Institutionalization

With the municipal climate program, the Klimaatenschap, and a regional organization for energy and sustainability (MOED) on the horizon, the city of Tilburg has three institutions to ensure that climate-related issues stay on the agenda and continue to make progress (Gemeente Tilburg, 2011b). The challenge, however, is in terms of formal connections between these institutions and the project steering of the Spoorzone. On the positive side, there is research in progress for the creation of a Spoorzone-specific ESCO (connected to the MOED project) to promote and implement sustainable energy solutions specifically for the Spoorzone (Gemeente Tilburg, 2011a). Nevertheless,

there is currently no direct role for these organizations in the formal Spoorzone oversight structure (Kuijsters, 2011). Also, there is still some uncertainty regarding the future of these institutions in regards to the restructuring of the municipal organization and the establishment of the Klimaatschap and MOED under the umbrella of Midpoint Brabant. At this time, their life has been extended to 2014 with the additional IKS funds awarded by the national government (Gemeente Tilburg, 2011e), however their long-term future remains uncertain.

Policy Areas

The Spoorzone presents a case where the municipality has a strong position in terms of the planning and implementation of their vision for the area. Starting with a municipal ground position offers more influence on the outcomes of the development.

Comprehensive plans can be laid out for transportation and ecological structure, new strategies can be made for energy, water, and waste management, and a vision can be constructed that builds on the cultural-historical character of the former-industrial area. As plots are sold or leased, building-level decisions come into play and those paying for and developing the land will make the decisions. While influence here is less, the municipality’s strategies for engaging in this process will be considered. Finally, behavioral aspects – i.e. sustainable production and consumption, food and agriculture, and waste management practices - will come into play more once building is complete and the Spoorzone becomes occupied. Since the focus of Spoorzone planning at this time is more on the creation of the space, less has been developed for the occupancy phase. Here the municipal-level strategy will be considered to give an indication as to how the Spoorzone can be expected to perform. A summary of the ratings given can be found in Figure XX below, followed by a more detailed analysis of each policy area as well as a discussion regarding the role of the municipality for each policy area.

Energy	Spatial & land-use planning	Mobility & transportation	Biodiversity & habitat	Water	Waste	Building retrofits	Production & consumption	Food & agriculture	Cultural & historical	Health & wellness

Policy areas receiving a green rating

Energy

Creating a more sustainable energy system receives considerable attention for the development of Spoorzone. Spoorzone reflects the work that is being done at the municipality level, which is heavily focused on energy as part of Tilburg’s climate program. While not yet finalized, the vision is for thermal heating and storage to form the foundation for a sustainable energy system. Further, a wind farm is being built in the northern commercial parks in cooperation with FujiFilm to provide electricity. Solar PV installations are also being researched for economic feasibility and 1300m² of PV have already been added to Hal 92, a building in ‘De Werkplaats’. Parallel to Tilburg’s efforts at the regional-level, a Spoorzone energy service company is being investigated as a means of coordinating and realizing innovative sustainable energy initiatives (Gemeente Tilburg, 2011a). These ideas and more are being brought together into a documented energy vision for the Spoorzone area (Kuijsters, 2011).

Aside from the large-scale projects, a number of instruments are in use by the municipality specifically to promote more efficient energy use at the building or area scale – EPC, energy labels, and GPR Gebouw– and will become more relevant as the project enters the building phase (Gemeente Tilburg, 2008a). Providing an EPC (energy performance coefficient) is required nationally in the building code for new buildings and requirements are being ratcheted down over time. In 2006, 0.8 was the maximum score allowed and in 2010 this maximum has been reduced to 0.6. The Tilburg climate policy tries to improve on these requirements and targets a 10% lower presentation than the national norm (0.72 in 2006 and now 0.54). These goals appear to be attainable, as in 2008, 33% of the new build exceeded the national norm. This number has risen to 56% in 2009 and 77% of new build exceeded the national norm in 2010. It will be interesting to see how the numbers come out when the national norm is lowered to 0.6 in 2011 (Gemeente Tilburg, 2011a).

Also in 2008, it has become a requirement to provide an energy label upon building, selling, or renting a residence. An energy label gives a standardized indication for how much energy the building uses in relation to other buildings of this type. The indicator is based on a letter grade and a color – the highest score being A++ with a bright green label and the lowest score is G with a bright red label. Energy use is considered for heating, cooling, ventilation and lighting based on the characteristics of the building, its installations, and a standardized factor for user energy consumption (Gemeente Tilburg, 2011b). This labeling system makes it possible for the municipality to inventory the existing buildings and create strategies for targeted improvement (see policy area for building retrofits below).

For GPR Gebouw, the city sets targets for residential buildings to score higher than 7 on each module within GPR Gebouw. While these scores cannot be enforced in the court of law, they can provide a good benchmark when approaching and selecting project developers that share the municipality's ambitions and they are being used more frequently. In 2008, 60% of houses applying for building permits submitted GPR scores, wherein 2010 76% of housing projects submitted GPR scores (Gemeente Tilburg, 2011a).

The municipality of Tilburg employs all forms of governing in regards to sustainable energy. The work being done at the regional-level to establish the Klimaatschap has helped to facilitate and thus enable the development of an energy vision at the development scale. The implementation of the vision is to be in cooperation with other participating actors. There are some examples of provision (albeit still in partnership with market parties) for the creation of a thermal heating and cooling infrastructure and the potential energy service company (ESCO). The vision for the ESCO is to create such an organization by bringing together market parties, making a network organization where the municipality is only one of many actors. With both of these examples, the idea and the start-up is initiated by the municipality, but the goal is to transition the role of the municipality into a facilitative and enabling role as soon as possible. Use of authority is limited to supporting national standards for energy efficiency, requiring energy labels for build, purchase and sale of buildings, and establishing selection criteria based on GPR scores, however these are not legally enforceable beyond the regulations in the building code. Finally, the municipality itself purchases 100% green energy for its use (Gemeente Tilburg, 2011b).

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipality purchases 100% green energy for its own use	Establishing an alliance in the Klimaatschap for the energy service company Establishing norms for GPR Gebouw and EPC scores that improve upon the national requirements	Partnering with the energy company to provide access to thermal heating and cooling Creation of ESCO to develop and promote sustainable energy solutions	Enforcing energy performance regulations for new or renovated buildings Mandatory energy labeling for buildings at point of build, purchase, or sale

Spatial & land-use planning

The Spoorzone is a prime example of making use of existing developed area for expansion and redevelopment instead of expanding the cities urban footprint. The departure of the national train company (NS) in 'De Werkplaats' frees up significant land in the city-center for redevelopment into a mixed-use area. The municipality has captured this opportunity by acquiring the land from NS to ensure control over its redevelopment. The ambition for the whole Spoorzone development is to offer 1,750 new residences (210,000 m²), allowing the city to meet its' growing residential needs within the existing city-boundary. The Spoorzone's office space (85,000 m²) also creates an alternative to business parks on the outer ring of the city for large employers with a large administrative staff, such as banks, insurance companies, and government offices seeking new office space within the more diverse city center environment. It's important to the municipality that the Spoorzone become a multi-functional area, with an emphasis on mixing uses and avoiding any dominant use, whether that be for offices, residences, or shopping space (Gemeente Tilburg, 2008a).

The Spoorzone is divided into different regions wherein the municipality is taking different approaches to the redevelopment. Specifically for the 'De Werkplaats', the municipality will be a leading actor in the planning for the redevelopment due to its strong land position. On the other hand, the more western and northern regions of the Spoorzone will be left more to the initiative of market parties (Gemeente Tilburg, 2011a).

The role of the municipality is primarily through authority and enabling. The development of a new land-use plan combined with the city's strong land position in 'De Werkplaats' allow for the use of authority in the design of the new area. On the other hand, the municipality's establishment of an alliance for climate and spatial planning as part of the municipality's climate program enables a diverse group of actors to provide oversight to the planning process with a specific emphasis on climate related issues in spatial planning.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Establishing an alliance in the Klimaatschap for climate and spatial planning		Developing new land-use plans to guide redevelopment towards municipal vision Using it's ground position to have a leading role in the design and development of 'De Werkplaats'

Mobility & transportation

The redevelopment of the Spoorzone provides an opportunity for the city of Tilburg to reassess the mobility and accessibility of the city for the various transportation modes. Particular attention is paid to ensuring safe, accessible, and attractive routes through the Spoorzone for pedestrian and bicycle traffic. The Burg Brokxlaan (earlier referred to as Noordlaan) will provide separated bike lanes and wide sidewalks on both sides of the road, serving as the main east-west corridor for bicycle and pedestrian traffic. Also, a pedestrian walkway will be provided between the built environment and the railway. This will offer buildings an opportunity to face the pedestrians with cafes, stores, entertainment venues, gardens, etc. (Gemeente Tilburg, 2011a). An overview of the bicycle and pedestrian routes is provided in Figure 5.11 below.

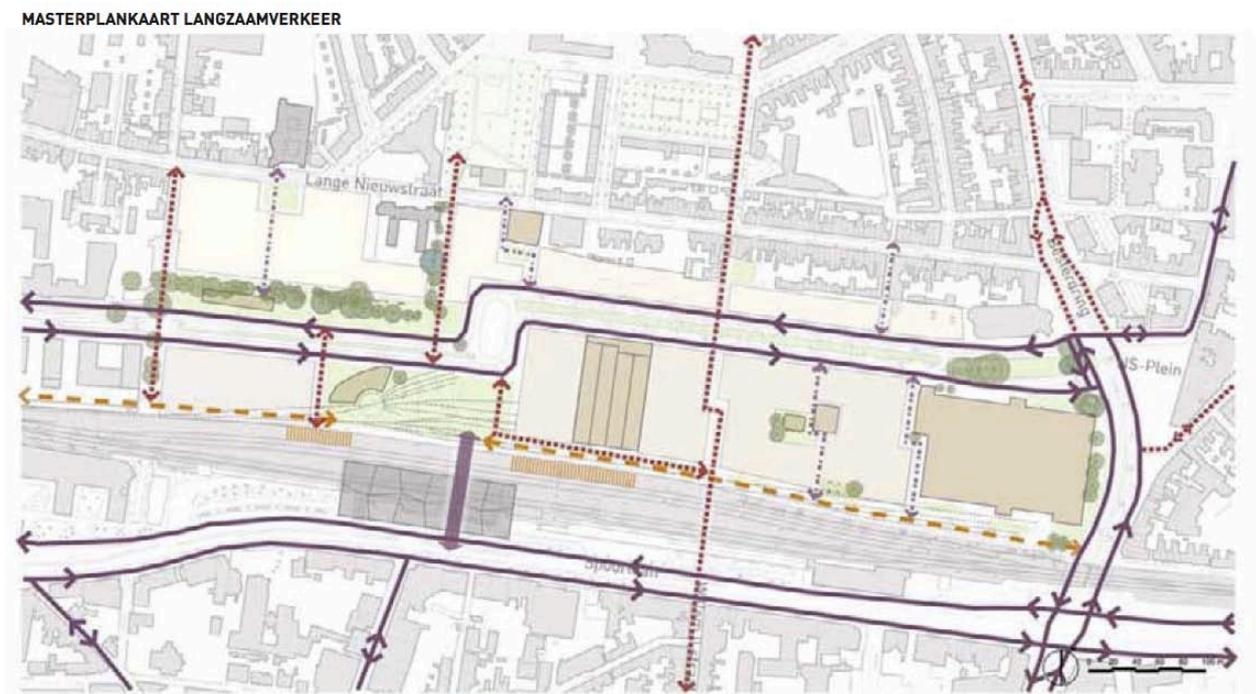


Figure 5.11: Bicycle and pedestrian traffic map provided in the Master Plan for 'De Werkplaats' (Gemeente Tilburg, 2011a)

Due to the central location, public transportation is a high priority. The train station is to be improved in terms of functionality by making it accessible from the north and creating a 24-hour passageway to connect north with south Tilburg. A key benefit of the Spoorzone project is to eliminate the barrier between north and south Tilburg that is presented by the railway. In addition to the station being passageway for pedestrian traffic to the north, there will also be another passageway for bikes and pedestrians crossing under the tracks. From a capacity perspective, the additional growth created by the redevelopment of the Spoorzone will require improving the capacity of the station, which will be accomplished by adding a 4th platform. The bus station, currently located south of the station will be expanded and will serve bus traffic for traffic going northbound as well as all traffic south of the tracks (Gemeente Tilburg, 2008a, 2011a).

The Spoorzone maintains vehicle accessibility as a priority, and though much thought is being given for alternative forms of transportation, 'De Werkplaats' will not become a car-free region of the city center. The Burg. Brokxlaan will be an important east-west vehicle and bus passageway through the middle of the area and connecting to the city ring roadway. To minimize the negative impacts of such a roadway, it will be built with 2 lanes divided by a wide green median, the speed limit will be set to 50 KPH and cross-streets will be minimized, keeping the flow of traffic moving. A roundabout at the train station will provide an opportunity for changing directions or turning around. Parking on the street will only be permitted along the Burg. Brokxlaan where it will be restricted to short-term paid parking, the rest of the parking needs will be met either on the plot itself (1 parking spot per 70m² functional space) or in three visitors paid parking garages that will be distributed throughout the area. Further initiatives promoting car-sharing through companies such as GreenWheels and electric vehicle charging stations are under consideration and are being researched (Gemeente Tilburg, 2011a).

MASTERPLANKAART AUTOVERKEER

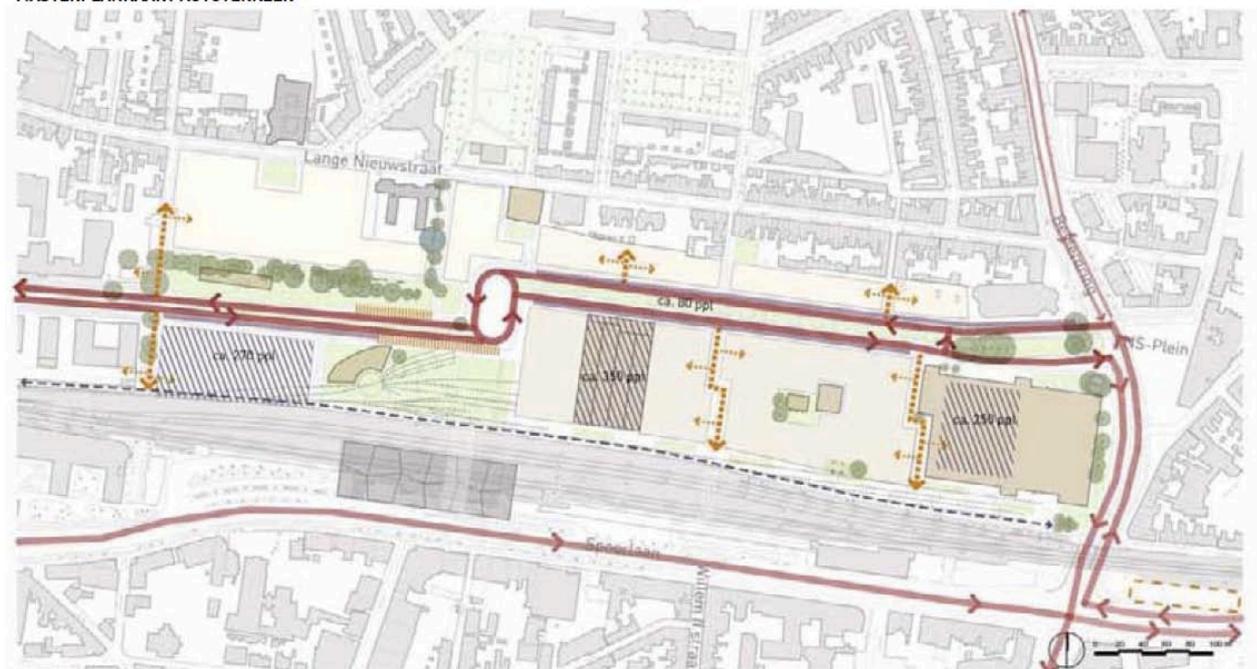


Figure 5.12: Vehicle traffic route through 'De Werkplaats'. The diagonally shaded boxes represent the 3 parking facilities (Gemeente Tilburg, 2011a)

The role of the municipality for governing mobility and transportation is another example where all governing modes are utilized. Transportation planning ensures that there is consideration for all forms of transportation and for the provision of infrastructure necessary to make non-motorized traffic safe and efficient. Ultimately, individual behavior will determine what form of transportation is being used, however provisions

are necessary to ensure that there are alternatives to vehicle-based transportation in the development. Enabling will play more of a role of influencing individual behavior, however concepts for promoting car-sharing and electric vehicles have not yet materialized. Finally, the municipality is also in the process of converting its vehicle fleet over to run on natural gas (COS Brabant, 2011a), an example of self-governing, not necessarily at the development scale, but at the level of the municipality as a whole.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Conversion of municipal vehicle fleet to run on natural gas	Promoting car-sharing and electronic vehicle initiatives	Bicycle and pedestrian walkways ensure space and safety for non-motorized traffic, making alternatives to vehicle-based travel possible	Transportation plan is developed and implemented by the municipality

Building retrofits

In 'De Werkplaats' the only retrofits will occur for the historically protected monument buildings, which will entail major renovations to repurpose them for new uses. Elsewhere in the Spoorzone, redevelopment will largely mean demolishing older buildings and replacing them with new buildings (Kuijsters, 2011). For building retrofits, there is no specific strategy for the Spoorzone beyond that of which occurs at the broader municipal level.

The municipality of Tilburg is currently addressing building retrofits in two ways. The first is a more general strategy for the municipality as a whole as a result of the Klimaatschap initiative and focuses specifically on energy efficiency. The municipality has sought covenant agreements with the social housing companies in order to ensure enough cost effective housing for those with lower incomes and to move the social housing sector in the direction of CO₂ neutrality by 2050. In exchange for building rights, social housing companies signing the covenant agreed to inventorying current energy ratings of buildings and taking part in an investigation into various scenarios for targeting the improvement of existing buildings to energy label C or higher (Gemeente Tilburg, 2011b).

Since 2008, the inventory process has improved since it's become a requirement to provide an energy label upon building, selling, or renting a residence. In 2009, 31% of the housing in Tilburg was social housing and 33% of the total housing had acquired an energy label, 95% of which was social housing. This means that nearly all social housing has now been labeled and its mostly privately owned and rented housing that remains to be inventoried. Of the housing with labels, 25.8% has the C label, 6.9% B, and 1.4% A. That means that approximately 66% of the housing with labels is below a C label and targeted for improvement, not to mention the additional 66% of the total housing where the current label is unknown. For the near term, 4000 social housing residences, 15% of social housing, will be targeted for improvement by 2015. This will include specifically physical measures to improve energy efficiency. In addition, all of the major social housing companies are promoting an energy savings and education program to educate the renters on how their behavior can contribute to energy savings. The location of the 4000 residences was not specified, however most of the housing with labels can be found closer to the city center as opposed to the outer regions of Tilburg (Gemeente Tilburg, 2011b). While this is an impressive effort to get the energy labels inventoried and to start improvement projects, the social housing sector only addresses 31% of the total housing market and a strategy is lacking for approaching private owners. This is logical, as four social housing corporations dominate the market in Tilburg, providing a

consolidated group for which the municipality can target for such covenant agreements. Homeowners and housing associations are much more fragmented (Gemeente Tilburg, 2011b).

The other way in which Tilburg addresses building retrofits for buildings is to request GPR Gebouw scores upon applying for a building permit. The city sets targets for residential buildings to score higher than 7 on each module within GPR Gebouw. This provides some hope for addressing privately owned housing, however the challenge is that these scores cannot be enforced in the court of law. It is encouraging, however that the GPR scores are being used more frequently. In 2008, 60% of houses applying for building permits submitted GPR scores greater than or equal to 7, wherein 2010 76% of housing projects submitted GPR scores greater than or equal to 7 (Gemeente Tilburg, 2011b).

Building retrofits is an area where the municipality is governing through authority and enabling. Authority is used in the establishment of covenants with social housing companies, to register energy labels and to ensure that buildings meet national building norms. The practice of promoting GPR Gebouw use helps to enable the retrofitting of buildings into more sustainable buildings.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promoting GPR Gebouw use to be completed when applying for building permits		Covenant agreement with social housing sector to move in the direction of energy-efficient social housing Requirement to obtain energy label for buildings upon building, selling, or renting as of 2008 Enforcement of building standards and codes when major renovations require new building permits

Cultural & historical

Of key importance to the redevelopment of the Spoorzone is to maintain the cultural-historical heritage of the former rail yard. The land-use plan interprets the cultural-historical value of the Spoorzone area in three ways. First are the architectural remains of De Werkplaats and railway-related buildings that provide physical cultural-historical value themselves. Secondly the Spoorzone provides a specific atmosphere and experience, a former enclave in the city that was focused on the railway. Lastly, this area is a symbol of social-economic development for the city of Tilburg – blue-collar laborers, their unions, and their employers. Certain buildings/structures in the Spoorzone area are considered national monuments and thus must be preserved in the redevelopment. Otherwise, efforts will be made to preserve and renew other historical buildings/structures that will help to preserve the character and identity of the area (Gemeente Tilburg, 2008a).

Spoorzone had been identified as a key location for the development of the newest cultural quarter of the city, making culture the leading theme for the development of 'De Werkplaats'. This was to include a variety of activities such as artwork displays, cultural

events, theater, film, music and dance (Gemeente Tilburg, 2008a). However, a 2010 revision of the ambitions for 'De Werkplaats' area suggested a shift from a cultural to more of a knowledge and innovation profile, at least temporarily setting aside plans of building a central facility to provide space for galleries, film and stage theaters, debate halls, and a café. While strengthening ties with the local colleges, universities, and the student population was already being planned as a way to stimulate cultural development in the 2008 land-use plan, now there is even more emphasis on targeting the knowledge profile for not only cultural development, but also for its economic growth potential (Gemeente Tilburg, 2011a).

The role of the municipality is largely authority and some provisioning and enabling. By giving key buildings and structures monument status, they are protected and will be renovated and converted into other uses. For provision, the municipality is actively seeking partnerships with cultural and educational institutions to provide cultural and entertainment to the development facilities in the area`. The municipality is also playing an enabling role by casting a vision and placing value on the history of the area, encouraging the redevelopment to maintain the character of the Spoorzone.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Establishing a vision for cultural-historical preservation and encouraging design that corresponds with the character of the area Promoting the use of GPR Gebouw to evaluate building design	Partnering with local educational institutions to create space for cultural facilities	Protecting of monument sites, ensuring their preservation and renovation

Health & wellness

As in the other case studies, health and wellness will be scoped down to what the municipality has specifically covered in their sustainability and planning documents reviewed in this research. Therefore, health and wellness will be considered in terms of the health affects of air and noise pollution stemming from redevelopment, safety risks, and opportunities for promoting well-being.

The key areas of focus in the environmental assessment report are the affects on air and noise pollution as a result of the planned redevelopment. Lying adjacent to the railway, rail traffic is already a major contributor to noise pollution in the Spoorzone. In the redevelopment effort, noise-reducing designs and sound barriers will be sought to dampen the noise along the tracks as much as possible (Gemeente Tilburg, 2008a). To facilitate the design process, an acoustic model is being built to ensure that noise levels fall under acceptable limits (Gemeente Tilburg, 2011a).

Auto traffic will also be a key contributor to both air pollution and noise nuisance in the area, especially with the creation of the Noordlaan/Brug Brokxlaan, the new east-west axis roadway that will flow through the middle of the Spoorzone area. Along this key artery, uses and functions will be deployed that can withstand relatively lower air quality and higher noise levels, directing those uses that require a better environment to streets within the Spoorzone that receive less vehicle traffic. In addition, other design elements can minimize the adverse health risks of air pollution. For example, placing height restrictions on buildings along the Noordlaan/Brug Brokxlaan will allow better airflow and

minimize a canyon effect that can trap the air pollution. Having separated bike lanes also creates extra distance between vehicle traffic and cyclists/pedestrians, reducing the health risks (Gemeente Tilburg, 2008a).

The affect of the redevelopment on safety is also considered in the environmental assessment. Notable is the increased 'group risk' associated with the planned high-density development (Gemeente Tilburg, 2008a). The group risk is essentially the chance that a group of people could be killed by exposure from deadly fumes, a plane crash, or other catastrophe in a given area. This is then logical that this would go up as the density of the area increases (Relevant.nl, 2011). On the other hand, while not discussed in the environmental assessment, safety can be improved through the creation of a lively area with improved connections accessibility to the historic city center under the railway and through the station. By planning for a public square outside the station, a pedestrian walkway along the railway, and the potential for a park attraction, the municipality is using its planning to provide open public space to improve the aesthetic and entertainment qualities of the area and increasing its use at more distributed times throughout the day and night. In this way, the redevelopment of the Spoorzone can offer more 'eyes on the street' and improve safety, as it is no longer an industrial barrier zone in the middle of the city (Jacobs, 1961).

The municipality is governing through authority, provision, and by enabling, all of which aim to improve the health and wellness potential for the Spoorzone. Authoritatively, it can enforce regulations for noise and air pollution levels which are determined by the zoning plan. From a provisional standpoint, the municipality is responsible for designing public space and installing adequate lighting, giving people a place to enjoy and creating an environment where people will feel safe enough to hang around. Also, by encouraging use of GPR Gebouw, it is further promoting the health and wellness of the buildings that are created in the area.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promoting the use of GPR Gebouw to evaluate building design	Municipal lighting of streets, waterfront, and public space Allocation of public space in the Spoorzone	Regulations for noise and air pollution levels in accordance with the zoning plan

Policy areas receiving a yellow rating

Biodiversity & habitat

While the broader Tilburg region is positioned with an abundance of valuable green space, there is a significant difference in the green space available to those outside the inner city and those choosing to live and work in the city center (Gemeente Tilburg, 2011a). The 'Oud Noord' region just north of the Spoorzone is currently lacking significant public green space, providing an opportunity for improvement with the plans of Spoorzone. Since 'De Werkplaats' is in the city center and replacing a former industrial area with a high-density city center environment, the area is currently lacking biodiversity and habitat (Gemeente Tilburg, 2008a). To rectify the situation, the municipality has created a memo recognizing the value of green space specifically for biodiversity and outlined an ecological structure presented in the Master Plan for 'De Werkplats'. The structure lays out ecological corridors to be maintained and improved throughout the city and, specifically for the Spoorzone, presents the Burg. Brokxlaan (referred to as 'Noordlaan' in land use plan) as a green parkway and identifies a 'green

attraction' to be created in 'De Werkplaats' area. Green space and gardens will also be provided in the station square and along the pedestrian walkway parallel to the railway (Gemeente Tilburg, 2011a). Other creative approaches are also to be sought, such as publically accessible green roofs or courtyards (Gemeente Tilburg, 2008a).

MASTERPLANKAART OPENBARE RUIMTE EN GROENSTRUCTUUR



Figure 5.13: Overview of the green structure provided in the Master Plan for 'De Werkplaats' (Gemeente Tilburg, 2011a)

Similar to many former-industrial areas being redeveloped for mixed-use purposes, much ground soil pollution will need to be cleaned up as part of the redevelopment effort, this will lead to improved ecological and groundwater quality. A plan for this clean up is a requirement for obtaining a building permit. Total costs for all ground pollution clean up for the Spoorzone are estimated between €26-56 million. Since not all areas are as severe as others, areas will be prioritized and cleaned up on a rolling basis. For 'de Werkplaats', the clean up process began already in 1998 and was still in process at the time of the writing of the land-use plan (Gemeente Tilburg, 2008a). After much consideration, the municipality has decided that it makes more sense to avoid disturbing as much of the polluted soil as possible, as the cost of cleanup for the pollutants grows when the soil is dug or displaced for building projects underground. To avoid these additional costs, underground building will be kept to a minimum and major parking facilities will not be underground (Gemeente Tilburg, 2011a).

Biodiversity and habitat is an area that lends itself again to authority, provision, and enabling forms of governing. Authority comes into play with developers meeting necessary standards by creating a plan for ground pollution clean up. Provision is used to layout the green spaces in the areas owned by the municipality and along main roadways – the municipal green structural planning facilitates the planning for ecological corridors throughout the urban area and extending into the surrounding area. Additional green space development by private parties will be enabled through the stimulation of green roofs and courtyards and the promotion of 'GPR Gebouw'.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Stimulation of green roofs and courtyards Promotion of GPR tool to encourage biodiversity	Provision of green space in 'De Werkplaats' and other areas owned by the municipality	Use of building permit process to address ground pollution cleanup

Water

The area in and around the Spoorzone does not have any canals, lakes, or rivers for recreation or transport purposes, therefore the discussion over water will be focused on the managing water run-off, sewage, and water use. The land-use plan for the Spoorzone makes an effort to position the water strategy in the context of the wider multi-level shift towards sustainable water management recognized by the municipal, district water board, provincial, national, and European levels. The realization is that water systems need to return to a more naturally resilient state, giving the system its natural space and not shifting burdens from one geographical space to another. Water management should be considered in three consecutive stages: capture, storage, and drainage. That is, capturing and using the water locally, storing water for later use, and allowing the remaining to drain away as naturally as possible, thereby putting less stress on the storm water system (Gemeente Tilburg, 2008a).

The Spoorzone had considered decoupling of the storm water and sewage systems and the development of an onsite natural water filtration system for 'De Werkplaats'. This presents the opportunity to make the sewage pumps and the purification process work more efficiently, while reducing the sewage waste discharge during an overflow. Filtration would then occur naturally, through the soil and permeable surfaces and eventually replenishing the ground water supply. Natural filtration presumes that the ground water pollution has been cleaned up so that the water filtering through the soil does not pick up pollutants and carry them to ground water supplies (Gemeente Tilburg, 2008a). This strategy will no longer be pursued due to the high costs of ground pollution cleanup. Instead, storm water will be channeled out of the city to the surrounding areas where a more natural system can be used since pollution levels are much lower (Gemeente Tilburg, 2011a; Kuijsters, 2011).

Despite the inability to pursue an onsite natural water filtration plan, an innovative solution for cleaning up ground water pollution has been identified to work in combination with the proposed thermal heating and cooling system. This can be accomplished by sanitizing the water that is pumped out and pumping the clean water back into ground water supplies (Gemeente Tilburg, 2011a).

The role of the municipality in terms of water is that of enforcing regulations for water quality. This leads to the provision of clean drinking water as well as drainage and sewage systems to manage storm and wastewater. Since the municipality determined that the cost of ground pollution was too high for much of 'De Werkplaats', this limits the ability to return to a natural water system in the immediate area surrounding the development. However onsite water retention and re-use is still promoted and help to score higher in the environmental performance of the building in terms of GPR Gebouw scores.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promotion of water efficiency through use of GPR Gebouw tool	Provision of drinking water Provision of stormwater drainage and sewage systems	Regulations for water quality

Waste

Since 'De Werkplaats' is not yet developed, there are not specific programs developed at this time for the management of waste specific to the Spoorzone area. This will come up as the project moves to a later phase and people start living and working in the area. As far as the building process is concerned, the use of GPR Gebouw stimulates the reuse of materials where possible and life cycle analysis as part of its environmental module. At the municipal level, Tilburg puts much effort into separation of waste. The process for processing of organic waste from fruit, vegetables, and gardens is becoming cheaper and more sustainable. The organic waste produces biomass that is being used for the production of green electricity and green gas (Gemeente Tilburg, 2011b). Glass, paper, and plastic packing material drop off stations are provided at the neighborhood level throughout the municipality of Tilburg. Additional possibilities are available for the drop-off of chemical products, electronic goods, large household furniture, and textiles (Tilburg.nl, 2011d). However, having these opportunities for waste separation doesn't necessarily mean that people will make the choice to do so. In a population survey used to gauge behavior choices in relation to the ecological footprint, 36% of the population is always separating plastic waste, 24% sometimes, and 38% never (Gemeente Tilburg, 2011b).

Waste is an example of a policy area where the municipality relies primarily on provision and enabling as a means of stimulating more sustainable behavior in regards to waste. Authority measures are more used for managing chemical or polluting waste that cannot be disposed of in the normal waste provisions provided by the municipality and in cooperation with the waste management company. By providing convenient means of separation combined with promotion to encourage its practice, the municipality can try to improve the choices made by individuals and businesses. The GPR Gebouw tool helps to stimulate thinking about waste during the building design and construction phases.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
	Promotion of waste separation GPR Gebouw stimulates LCA studies and reuse of waste where possible in the building process	Conveniently located disposal stations for glass, plastic, and paper waste	

Production & consumption

Since the Spoorzone project is still very much in the planning stages and nearly all of the building still needs to take place, there are limited opportunities for the municipality to

specifically stimulate sustainable production and consumption in this area, the exception being from a building materials standpoint. Use of the GPR Gebouw tool inherently promotes consideration of building materials and re-use decisions in the building process, which can help generate a higher score in the ranking (GPRGebouw.nl, 2011). Beyond this practice, consideration will be given here for the municipal efforts towards promoting sustainable production and consumption in general.

In 2010, the national government started a program for sustainable purchasing, setting a target for the national government to purchase 100% sustainable products and for local authorities and municipalities to target 75% sustainable purchasing (COS Brabant, 2011a). Tilburg’s policy is only to purchase from socially responsible companies, thereby already reaching a level of 100% sustainable purchasing (Tilburg.nl, 2011a).

For the further stimulation of socially responsible business (Maatschappelijk Verantwoord Ondernemen – MVO), the municipality has developed an MVO program, including subsidies through 2012, a LinkedIn group for online discussion and networking, and an annual prize to reward leading socially responsible businesses (Gemeente Tilburg, 2011c). Tilburg also has the ambition to become a Fair Trade city (COS Brabant, 2011b), which sustainable purchasing is one of the prerequisites for receiving that designation. Additional criteria for becoming a Fair Trade city are the establishment of a local Fair Trade work group, the specification of Fair Trade in municipal policy, the sale of Fair Trade products in local stores, cafes, and restaurants, local businesses and organizations (schools, health care facilities) are purchasing and using Fair Trade products, the municipality organizes a media event and an ongoing campaign regarding Fair Trade products, and the Fair Trade work group leads an initiative to stimulate socially responsible business within the municipality (Fairtrade Gemeente, 2011). As of this research, Tilburg has not yet achieved Fair Trade city status.

Sustainable production and consumption is a good example of an area where the municipality has very little authority or the capacity for provision beyond limited subsidies. The primary means of governing are therefore through enabling and self-governing. Enabling is achieved by promoting socially responsible businesses and fair trade products. By striving to become a Fair Trade city, the municipality is stepping outside of the municipal organization itself to help promote that Fair Trade is widely available and used in the city of Tilburg. The city has also committed itself to socially responsible purchasing, thereby proclaiming its purchasing 100% sustainable.

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Sustainable purchasing program for municipal organizations	Promotion of Fair Trade products and their consumption	Making subsidies available for socially responsible companies	

Policy areas receiving a red rating

Food & agriculture

The Spoorzone’s stage of development means there is only limited ability to stimulate sustainable food and agriculture at the level of Spoorzone. However, since the project will be in development over a period of several years, there is current research being done to explore using vacated land for alternative purposes while waiting for the development to occur. There is potential to allow such space to be used for community gardens or urban agriculture, however no final decisions have been made (Kuijsters, 2011).

At the municipal level, Tilburg includes food into its sustainable purchasing program discussed under sustainable production and consumption. In this case, 100% of the milk purchased by the municipality is biologically made. The municipality also helped adjust land-use plans to create 'De Groene Kamer', a 30-hectare area southwest of Tilburg to reconnect people with nature. In this space people can experience nature directly, learn about sustainable agriculture and attend presentations, purchase sustainable products, network with like-minded individuals and space can even be rented for sustainability-related events (Fontein & Stuiver, 2011).

In terms of the role of the municipality itself, like production and consumption, this is an area where the focus is on enabling and self-governing, however arguably to a lesser extent than the production and consumption category. While there are a couple of examples of enabling provided at the municipal-level (and aided by the municipality's zoning authority), the municipality is not strategically investing significant time or money into sustainable food and agricultural initiatives. From a self-governing perspective, biological milk is being purchased, however no other examples were given in regards to the broader purchasing policy. Just because they are purchasing socially responsible products, doesn't necessarily mean that all food being produced by the municipality is sustainable produced or from the local region, it may just be that food suppliers meet other criteria for being socially responsible companies (personnel policies, having a social mission, transparent communication, marketing, etc.)

Self-governing	Governing through enabling	Governing by provision	Governing by authority
Municipal purchasing of biological milk for its cafeterias	Investigating the temporary use of idle land for food and agriculture		Working to remove barriers for innovative initiatives, such as adjusting land-use plans to allow for the creation of 'De Groene Kamer'

Conclusions

The Spoorzone project offers a case where the municipality has a particularly strong position due its ground position in 'De Werkplaats'. Given its central geographic location, the city has the rare opportunity to significantly expand the city center and perhaps redefine its identity from its industrial heritage to a more innovative and knowledge-based culture and economy. This opportunity has resulted in significant municipal planning, creating an opportunity to implement much of the work going on at the municipal-level within the climate program to the realization of the new urban core. Despite the climate ambitions, investment still needs to be attracted in order to build and the requirements cannot make the development costs prohibitive. Tradeoffs will be made and actors will make their own decisions regarding their investments and their behavioral choices. However at this stage of development, most of those decisions still lie in the future and its important to consider how the municipality intends to influence those decisions to realize its own ambitions of a new dynamic city center, while meeting its climate and sustainability goals.

The principle strengths of the Spoorzone development are many. The principles of integration and long-term outlook both score well, however participation and social equity receives less specific attention. The procedural ratings are more mixed, as the Klimaatschap has provided a broad system of alliance networks that can be engaged, creating a culture of joint-decision making and partnership and instruments and tools are available to assess the performance of the development. On the other hand, without a clearly defined sustainability strategy and institutionalized links to the climate program

ensuring the use of these networks and tools, it's hard to tell what priority will be given to sustainability as the project proceeds. The municipality is faced with engaging investors to improve the sustainability performance of their designs at the risk of setting the bar too high and discouraging investment.

At the policy-area level, city planning has a direct influence on the ratings given for spatial and land-use planning, mobility and transportation, biodiversity and habitat, waste, water, cultural and historical, as well as health and wellness policy areas. The ratings are dependent not only on the content of the municipality's proposal, but also on the decisions that are being made. Green ratings have been given to policy areas of spatial and land-use planning, mobility and transport, cultural and historical, and health and wellness. Biodiversity and habitat and water on the other hand, receive yellow ratings due to the municipal strategy to avoid the high costs of pollution cleanup on the former industrial site of 'De Werkplaats' and the consequences that has on the ability to implement a more natural water management system that would rely on water infiltrating through the soil and back into the ground water supply. Waste also receives a yellow rating, but this is more due to a lack of specific attention or strategy for managing waste within the Spoorzone at this time. This is in part due to the fact that much of the development has yet to occur and this item may yet come on the agenda as buildings are completed and become occupied. From a municipal standpoint, the city offers the provision of separated waste management facilities, however their use is still largely dependent on individual behavioral choices that are more difficult for the municipality to influence.

For the topics of energy and building retrofits, the municipal climate and energy strategy has significant influence on the development. There is considerable focus on putting together a strategic plan for providing sustainable energy to the Spoorzone area, as well as a program for engaging existing buildings to improve energy efficiency. Considering the institutionalization of this program at the municipal-level and the associated instruments and tools available to evaluate energy performance covered under procedures above, green ratings are given for both policy areas. The caveat here is whether the lack of institutionalization of these practices at the project-level will mean that these instruments and tools are not prioritized in the face of development decisions. This is a real concern, as when interviewing the project director for the Spoorzone in regards to the use of GPR Gebouw, it was discovered that while the tool is known, it is not currently high on the radar in the daily activities of the project (Kuijsters, 2011). Perhaps this is again due to the stage that the project is in, as more emphasis is on securing investors than on the more detailed design aspects of building site that will come up as the investors proceed to the build phase. As many of the municipality's ambitions are not legally enforceable, collaboration will be necessary to realize these goals.

Finally, production and consumption and food and agriculture are areas where the municipality has less influence on the outcomes. At this time, there is limited attention for either of these topics in regards to the Spoorzone specifically. At the municipal-level, the city's purchasing program, its program for encouraging socially responsible business and its ambition to become a fair trade city offer opportunities to encourage both sustainable businesses and the use or consumption of their products. Food and agriculture receives less direct attention under these programs. Strategies for making vacant land available for public gardens for food and agriculture production under consideration, however nothing has materialized at this time.

Some key observations can also be made regarding the role that the municipality is playing in terms of the policy areas mentioned above. Due to the current status of the Spoorzone project, self-governing is mostly relevant at the municipal-level and not yet at the project-level, which will become more relevant as municipal facilities will be built in the Spoorzone. The most common self-governing approaches are building-level

efficiency programs, conversion of municipal vehicle fleet to alternative fuels, and purchasing programs for green energy and indicating a preference for socially responsible businesses.

Much like the other developments, authority is used in situations where there is a legal basis for doing so. This basis arises when enforcing minimum standards for energy performance, noise, air, and ground pollution levels, water quality, and for the protection of historic monuments. The limiting factor here is that the municipality does not have a legal basis to raise these standards and enforce the new ambitions on builders. Achieving the municipality's goals beyond the minimum requires more of an enabling and partnership approach, selecting developers that share their ambitions and in some cases by signing covenant agreements or providing incentives. The ability to require an energy label upon construction, sale, or rental of a building helps the municipality inventory the current efficiency of the existing building stock.

Provision is most relevant when providing municipal services. This is an effective way of systematically improving the sustainability of the area, so long as it remains affordable for the municipality to do so. This includes provision of drinking water, sewage and stormwater management systems, the realization of transportation infrastructure such as roadways, bike lanes, pedestrian pathways, bus stops, as well as the creation of green space or green corridors along roadways or railway. Additional forms of provision are ensuring that there are facilities for the separation and collection of waste products and providing municipal lighting to improve safety in public places. Provision may also occur for energy infrastructure, as the city finalizes its energy strategy and partners with the local energy company to provide thermal heating and cooling to the Spoorzone.

As the influence of the city declines, strategies of enabling become more relevant. This is the case for both the decisions of the market parties and the individual behavior choices of residents and commercial or non-profit occupants of the Spoorzone. Here the work of the municipal climate program and the Klimaatschap has much potential for engaging many actors that may be able to improve sustainable outcomes where the municipality is not able to make the provisions. When there is a common agreement on sustainability ambitions, tools such as GPR Gebouw are promoted to facilitate the decision-making process. Behavior choices are mostly influence through promotion and campaigns for choice of transport mode, waste separation, and consumption of sustainable products and food.

Chapter 6: Learning from front-running cities in the Netherlands

The case studies have been provided to give some depth and examples to investigate the breadth of the municipality’s sustainability initiative and how well urban development projects reflect that ambition. Having two cases in Amsterdam, it was also possible to gain some insight on how that may vary between projects within the city, shedding light on how different strategies are pursued within the same city. The experience gained from the case studies can now help provide answers to the questions asked in this research presented in the opening chapter. Since the central question is broadly stated and high level, it will help to first answer the sub-questions in detail and then return to the central question as a conclusion. The purpose of this chapter is to cover the sub-questions and the central research question will be addressed in the concluding chapter of this research that follows.

6.1 Amsterdam & Tilburg, striving for comprehensive approaches to sustainability?

The first task was to assess the extent to which the chosen frontrunners in the Netherlands are striving for a comprehensive approach to sustainability. Recall, the first sub question in the research design:

1. *To what extent are the cities selected in the case studies striving for comprehensive approaches to sustainability at the municipal level?*
 - a. *What is meant by a comprehensive approach to municipal-level sustainability initiatives?*

Before the question could be answered, an understanding of comprehensive approach to sustainability needed to be developed. The comprehensive approach to municipal-level sustainability initiatives was outlined in the development of the analytical framework used in this research and consisted of the list of principles, procedures, and policy areas for sustainability displayed in the Table 6.1 below. Also displayed in the table is a complete summary of the evaluations given in the three case studies. Together with the descriptions of the municipal-level approaches outlined in the case study chapters, enough insight has been gained to answer the first sub question. The evaluation will be discussed per city, therefore Amsterdam and Tilburg will be taken in turn below.

	Principles				Procedures				Policy Areas										
	Integration	Long-term outlook	Participation	Social equity	Sustainability strategy	Institutionalization	Fostering partners & networks	Instruments & tools	Spatial & land-use planning	Energy	Mobility & transportation	Biodiversity & habitat	Water	Waste	Building retrofits	Production & consumption	Food & agriculture	Cultural & historical	Health & wellness
Zuidas Amsterdam	●	●	○	○	●	○	●	○	●	●	●	●	●	●	○	○	○	●	●
Buiksloterham Amsterdam	○	●	○	○	○	●	●	○	○	●	●	○	●	●	○	●	●	○	●
Spoorzone Tilburg	●	●	○	○	○	○	●	●	●	●	●	○	○	○	●	○	●	●	●

Table 6.1: Summary of case study evaluation results according to the comprehensive sustainability framework developed in Chapter 2

Amsterdam

Amsterdam has built a program for sustainability that is quite broad and covers nearly all aspects of comprehensive sustainability used in this research. When reading the table from left to right, Zuidas clearly performs better than Buiksloterham, which is a direct consequence of the municipal strategy to not develop a detailed strategy for the Buiksloterham area. The Zuidas project on the other hand exemplifies the strengths of Amsterdam's municipal-level approach.

While not all areas receive green evaluations, the municipality is taking an active role in stimulating nearly all policy areas. The only area that seems to be lacking a clear strategy at this time is Food & Agriculture (exception being the inclusion of local, biological, and organic food in the municipal purchasing program). Just a year ago, this would not have been the case. An integrated program for Food & Agriculture (Proeftuin Amsterdam) was pursued from 2006-2009, however due to political changes and financial pressures stemming from the financial downturn, the budget was not renewed when funds expired in 2010. While this may mean that the municipality is backing off of this objective for the time being, the program did help to put the issue on the agenda and there are a number of citizen-led food initiatives that have sprung up since the program was started. The main themes from the program can also still be found in the current Placemaking strategy for Zuidas, however only limited steps are being taken for the pursuit of a sustainable food system in the area.

Other areas of weakness are more in the principle and procedure categories. Although its mentioned at a high level, very little attention is given to Social Equity beyond regulations that ensure at least 30% of all housing is for the social rental sector. While participation has become standard in many spatial development procedures, the practice of using participatory processes is not very well emphasized in the key strategy and spatial development plans and it's hard to see how input gained in participatory processes impacted the municipality's current strategies.

Institutionalization and Instruments & Tools are the other areas receiving yellow scores. While there is an institutionalized program for sustainability in Amsterdam, it does not have the resources to provide oversight to urban development projects and ensure consistent approaches between projects. The program also lacks a strong package of instruments or reporting tools to evaluate and monitor sustainability. BREEAM's adoption in Zuidas remains low and there is no clear procedure to ensure its use or to assist developers in the process of pursuing certification. Buiksloterham has employed GPR to evaluate developers in the sustainability tender process, however that process was a one-time deal. The municipality could benefit from making clear procedure for evaluating the sustainability of its developments and that should include an alternative to BREEAM certification, since not all buildings will be able to attain certification, however systems such as GPR would still allow for an evaluation that could be used for benchmarking even when the performance is lower. Lastly, efforts at reporting have remained high level and a clear set of sustainability indicators have just recently been developed at the municipal level. At the time of this research there was no plan to try to disaggregate the indicators at the development scale, making it difficult to compare the performance of projects within the city.

These procedural weaknesses are perhaps most concerning, as it is the procedures that allow the city to follow through on its principles and give staying power to the municipality's efforts across the spectrum of policy areas. Not only do the procedures help to ensure broad progress towards comprehensive sustainability, identifying key procedures and using them consistently will also provide additional data that can be used for performance reporting purposes.

Tilburg

To understand the extent to which Tilburg is able to achieve comprehensive sustainability, it's important to recall that Tilburg's strategy started out primarily focused on the climate issue with an emphasis on energy and CO₂ reduction. More recently, the city has managed to broaden its efforts and develop initiatives for nearly all of the policy areas in this study. The one area that is clearly lacking attention is Food & Agriculture. The municipality has no program for stimulating a sustainable food system and within the municipal organization the only real consideration is the inclusion of biological milk in its purchasing strategy. There is an initiative for making Tilburg a 'Fair Trade City', however it is a private initiative. On the other hand, Tilburg's efforts towards sustainable production and consumption are considerably better. There are two climate alliances related to this policy area - 'Sustainable companies and business areas' and 'Behavioral change'. There is also a program to support and stimulate socially responsible business as well as a municipal purchasing program that claims 100% sustainable purchasing (however that's based on its preference for socially responsible vendors and products and not necessarily the most environmentally sustainable). If the municipality could leverage these efforts to include more emphasis on environmental sustainability, it may help give room for discussions around the sustainability of the food system and could lead to the inclusion of sustainable food and agriculture production initiatives.

Other weaknesses exist in the categories of principles and procedures. Similar to the developments in Amsterdam, Social Equity is not a major theme in the Spoorzone project, however the municipality has given it more attention at the municipal-level with a climate alliance dedicated to the social housing sector and a reporting tool that used the three capitals approach (ecological, economic, and social capital) that reported a variety of indicators regarding the social capital in Tilburg. Also, like Amsterdam, while Tilburg has built a system around networking, it remains difficult to see how participation has influenced the development of the Tilburg strategy. Being more explicit in regards to the participatory processes used, which organizations participated, and how that impacted the municipality's strategy could rectify this deficiency. Giving participation more attention would also help promote additional stakeholder interest and their future involvement, as other stakeholders could see that their participation could have an impact.

The biggest threat from a procedural point of view is that the institutionalization of the climate program is at risk. Reorganization within the municipality does not include a place for the climate program and the municipality's efforts to fully transition the program to an external network-based organization in the region has not been completed. In contrast to Amsterdam, Tilburg is much more dependent on special funding from national programs and with the no successor in place for the SLOK subsidy, the municipality will lose valuable resources unless funding can be generated from other sources (through European funding or through networks). Temporary funding (IKS) has been granted to keep the program within the municipality until 2014, however the long-term future of the program remains uncertain.

6.2 Municipal influence & strategies for a comprehensive sustainability approach

The next task was to develop an understanding of the influence that the municipality has and to identify the strategies being used to achieve their sustainability ambitions. Recall the sub question from the research design:

2. *How does the role of the local authority influence a comprehensive sustainability approach at the municipal level? (Explanatory knowledge)*
 - a. *What role is the local authority taking to promote its sustainability agenda? (Descriptive knowledge)*

To define the role of the municipality in the development case studies, four types of governing were considered in relation to each policy area: authority, provision, enabling, and self-governing. In this research, the role varied per policy area, and for each project, examples were given. A summary table including the examples from each case is provided in the Appendix. More general comments will be made in response to the following question.

- b. Given the local authority's role, what strategies are being used to make progress towards meeting the goals of its sustainability initiative? (Descriptive knowledge)*

To answer part b above, different strategies will be identified and discussed below. Since the role of the municipality is different across policy areas, this question can be best answered by grouping the policy areas based on the different strategies identified. The strategies fall under four categories and will be discussed in the following order: infrastructure, building sustainability, the softer side (cultural & historical and health & wellness), followed by production and consumption (including food & agriculture).

Spatial planning and urban infrastructure systems

Significant municipal activity and influence stems from spatial and land-use planning. The creation of structural visions, project visions, and specific land-use plans has a direct influence on the more physical policy areas of transportation, biodiversity, water, and waste systems. For these systems, the municipality plays the roles of authority, provider (at least in partnership), and enabling. The key strategy for these urban infrastructure systems is through provision and then supplementing the provision by using authority where possible to ensure the systems use and enabling strategies to market and promote use and behavior.

Detailed plans are made and approved and infrastructure is provided for all: transport (roads, railways/stations, bus routes, bike paths, walkways), biodiversity (allocation of green space, greening along roads, railways, and canals), water (canals, sewage and drinking water systems), and waste (separation and collection services). Enabling is then used as a method for targeting the user, whether that is increasing the use of public transport or alternative modes; contributing to additional green space through roof, wall and garden installations; using water more efficiently by installing water efficiency measures, changing behavior, or retaining water onsite; and encouraging waste separation and recycling practices.

Energy also received much focus in the spatial planning context, as systems for district heating and cooling were provided and authority was used to ensure its use (exceptions were made for those that made geothermal heating and cooling installations). In Zuidas however, as more buildings have installed geothermal systems and more understanding is gained regarding the system placement and its effect on its neighbors and the district heating/cooling system, the municipality has recognized the value of taking a more strategic approach. Now the municipality is working with an area in the Zuidas to develop an integrated strategy for the optimal dispersion of district heating/cooling and geothermal heating/cooling systems.

Through spatial planning, the municipality has considerable influence to at least provide systems of sustainable infrastructure in a local geographic context. Once provision is arranged, the municipality can combine authoritative and enabling approaches to encourage its use. This can be an effective means of improving sustainability, given that the municipality implements these systems with a high standard for sustainability. Other aspects of sustainability are a bit harder to provide for systematically within a geographic region, and therefore other strategies are necessary if the municipality wants to play a role of influencing sustainability in a comprehensive way. Just focusing on

infrastructural systems is a lot, and for many cities, focusing on sustainable transportation, biodiversity, water, waste, and energy may already consume all of its resources. It is arguable, that since resources are limited, these could be considered the core competencies of the municipality and other areas could be left to non-government and private initiatives. The cities in this case study, however, have gone further to address sustainability, looking for ways to influence not only the buildings that are built or improved, but also to influence cultural & historical values, health & wellness, as well as stimulate the sustainability of increasingly global systems of production & consumption and food & agricultural systems within their cities (albeit to a limited extent).

Spatial planning and sustainable buildings

Moving away from infrastructural systems, buildings present a different kind of sustainability challenge and the approach will vary depending on whether the focus is on new or existing buildings. As a result, each will be taken in turn.

Strategies for new buildings

For new buildings, spatial planning can use zoning, urban planning, and national building code regulations to influence design. This gives the municipality authority in determining where different types of buildings or functions are located, some design specifications such as height, materials, and parking provisions, and minimum requirements for energy efficiency, lighting, and air quality. The principle way of enforcing such standards is through the building permit process, where designs need to pass inspection and permits obtained prior to commencing with the building process, but an important caveat is that most of the decisions impacting the sustainability performance of the building go beyond the minimum standards and are outside the authority of these regulations.

The case studies revealed two key strategies for moving beyond these minimum requirements when it comes to influencing building sustainability: promotion of higher standards through building performance evaluation tools (BREEAM, GPR) and setting municipal standards that improve upon national norms; and promoting more sustainable buildings through market competition - the sustainable tender process.

Evaluating building (and area) performance

All projects mentioned have used some form of building evaluation tool to improve the sustainability performance of building projects. For Zuidas in Amsterdam, the main emphasis is on encouraging BREEAM certification, an internationally recognized certificate with high sustainability standards. Unfortunately, the standards are so high that very few buildings have pursued certification. Further efforts are made to discuss the ZIPS strategy with potential investors and developers, which includes sustainability ambitions, however there are no hard requirements with this process and it's used as more of a discussion tool to improve the quality of the building designs. Buiksloterham used the GPR building system to evaluate bids in the tender process (discussed below).

Tilburg provides the more institutionalized method of influencing building sustainability in this study and combines the strategy for building performance evaluation with the strategy to improve upon national norms by setting municipal standards for energy efficiency. Tilburg uses the GPR building evaluation system to evaluate building designs, setting minimum requirements for scores in each module. While they cannot require that all projects submit GPR scores, adoption is high and rising. 60% of housing projects submitted GPR scores in 2008, up to 76% in 2010. Tilburg also puts downward pressure on national EPC maximum norms for energy efficiency, targeting a 10% lower score. Again, while 33% of projects exceeded the norms in 2008, 77% building projects exceeded the norms in 2010.

Neither city has thus far institutionalized any process regarding the use of area based evaluation tools (BREEAM Gebied, GPR Stedenbouw), however some pilots are underway. There is much promise for these tools in their ability to expand the scale large enough to allow a broader and more integrated assessment of sustainability than what can be done at the building scale.

Stimulating market competition for sustainable design

Buiksloterham provided an example of how a procedure can be designed to create competition between market parties on sustainability design instead of price. The sustainability tender process awarded building rights to developers for proposals based on the sustainability of the design, which was made possible by fixing the price of the land at a level that would promote enough competition for the tender. The key to this process was that it was municipally owned land and a relatively low price was placed on the land rights. This process has not been reused since the Buiksloterham case.

Strategies for existing buildings

Dealing with existing buildings seems to be even more challenging. For existing buildings, improving sustainability is up to the owner and there are fewer levers for influencing renovation or building retrofits. With the exception of enforcing building standards if new building permits are necessary, opportunities for exercising authority are limited and provision is only available through limited project subsidies. How the municipality chooses to engage as an enabler has a great deal of influence on whether significant improvement will be made with existing buildings. The two main strategies are to: provoke owner-initiated investment and proactively target collectives and establish covenant agreements.

Provoke owner-initiated investment

A common strategy for dealing with existing buildings is to simply make information available regarding the benefits of various building improvements – whether that's through behavioral change (often associated with energy or water efficiency) or by making building changes and renovations (improving insulation, installing solar panels, green roofs, water capture and reuse systems, etc.). Sometimes, municipalities will make subsidies available to incentivize taking on these additional investments (used for insulation, solar panels, and green roofs). This is a strategy that relies on mostly owner-initiated action.

Proactively targeting collectives and covenant agreements

An alternative strategy would be to be more proactive – seeking out buildings that need to be improved in terms of sustainability, however that will take more resources and resource efficiency will be important for such an approach to be feasible. While focusing on each and every building owner would be overwhelming, Amsterdam and Tilburg sought collectives that provided a central point for influencing multiple buildings. A large source of collectives in the Netherlands is social housing corporations, which manage 49% of the housing in Amsterdam and 31% of housing in Tilburg. The largest collectives were identified and covenant agreements were made to improve the existing building stock. Making use of national building requirements, the municipality has inventoried energy labels for buildings (as of 2008 labels must be provided upon building, selling, or renting a home) and uses this information to set targets for improvement as part of the covenant agreements. This process of inventorying collective ownership helps to target the municipality's limited resources and make an impact on what would otherwise be a highly fragmented effort of influencing building owners.

Within the last year, Amsterdam has taken this process a step further and has also formed covenant agreements with the private rented housing market (22% of the housing market). Combining the social housing and private rented housing segments of the housing market, Amsterdam can cover up to 71% of the housing market with covenant agreements. This begs the question of what additional collectives can be identified and targeted with covenant agreements – large housing associations, large property owners in commercial and industrial markets, etc.

Lastly, the main focus of these covenants thus far have been on energy efficiency, it would be interesting to take on these collectives with consideration for additional improvements for improving biodiversity and greening, water management, waste reuse and disposal. Targeting collectives could also address transportation: by targeting large organizations and providing some sort of benefit in exchange for the organization implementing a commuting program – incentivizing and providing benefits for non-automobile or electric automobile commuting.

Spatial planning & the softer side of sustainability

Cultural & Historical

While somewhat less planable, the policy area of culture & historical is also impacted by the work of municipal spatial planning. Examples were provided in this research of how the municipality could deliberately cultivate culture in developments. In reality, the cultural sphere of an area is much more spontaneous, and therefore cannot be fully planned. The hope is that the municipality's efforts help attract the right people to the area that further contribute to the diversity and further invest in the cultural atmosphere of the area. The two key strategies that emerged were: establishing a municipal cultural development program and supporting cultural development by making space available for and helping to promote exhibits and events.

In Zuidas, a cultural program was created which led to the creation of Virtual Museum Zuidas as well as partnerships with academic and artistic institutions that helped attract cultural diversity to the area. Public space is made available to put the work of these institutions on display. In the Spoorzone, Tilburg had high ambitions of turning 'De Werkplaats' into the new cultural quarter for Tilburg. Unfortunately, municipal investment was limited and finding the right partnerships proved difficult. As a result, focus shifted more to academic partners to attract both cultural and economic development in the area. In either case, the municipality helps to enable cultural development with the promotion of cultural events and historical heritage.

Health & Wellness

Municipal spatial planning efforts and the implementation of those plans can impact health & wellness, albeit to a certain extent. The primary strategy for doing so is by using zoning regulations to try to control exposure to noise and air pollution to create a positive and safe environment. Perhaps more impactful, however, is the cumulative effects of other policy areas when integrated into a coherent strategy for one area development. As all of the other policy areas materialize to construct a mixed-use urban development with sufficient transportation, ample green space and biodiversity, clean and effective water systems, an effective waste management system, clean and renewable energy systems, clean air, and minimal noise nuisance, the hope is that people will respond positively in terms of health and wellness. An important caveat is that much of what an individual experiences in regards to their health and wellness is based on their own perceptions, preferences, and experiences – making it difficult for the municipality to have a high degree of influence over the individual response and behavior.

Influencing production & consumption patterns (including food & agriculture)

Trying to gain influence over the production and consumption patterns is a significantly different challenge than the previously mentioned policy areas. First, unlike urban infrastructure, the municipality is not in a position where it can play a strong provisioning role. Secondly, both the product supply chains and retailers are increasingly global and cities cannot restrict what is offered within their geographical boundaries. As a result, each city has scoped their approach to this category differently, and their effects are limited by the municipality's lack of influence. What emerges are three key strategies: building a reputation for sustainability and attracting additional organizations and individuals that seek to further these efforts, proactively facilitating networks in order to develop partnerships and collective initiatives, and finally, a strong municipal purchasing strategy that helps develop the market for sustainable products and sets an example for other organizations to follow.

Attracting the sustainably-minded by building a reputation for sustainability

The strategy of Amsterdam, and especially in the Zuidas development, is to leverage other sustainability efforts to build a reputation of sustainability and innovation that will attract sustainable-minded businesses and residents and improve the market for sustainable products and services in the area. In this way, the work that the municipality does in the other policy areas has an enabling effect on sustainable production and consumption. Tilburg does not specifically engage in this strategy for sustainability, however it does this in hopes of stimulating innovation and the knowledge-based economy that can spur off from Tilburg's strength in educational institutions.

Building the sustainability community through networking

The previous strategy can have more impact if combined with a strategy for building partnerships and networks. By identifying businesses in the area that share the municipality's sustainability ambitions, partnering and networking is used to expand the community of interested actors and hopefully spur collective projects.

In Amsterdam, this has led to organizations such as the Green Business Club, Amsterdam Bright City, and the Amsterdam Innovation Motor. While these organizations have succeeded in bringing a variety of organizations and actors together, the biggest challenge that remains is organizing collective initiatives. For example through the Green Business Club in Zuidas, some businesses are experimenting with joint projects for car-sharing, however joint efforts to collectively purchase solar panels or create investment financing sustainable energy projects have not gotten off the ground.

In Tilburg, this is done through the Klimaatschap program and the Tilburg program for socially responsible business (MVO). Within the Klimaatschap an alliance has been established for 'Sustainable companies and business areas'. The focus is mostly on energy – helping local companies become more energy efficient and seeking out opportunities to generate renewable energy. Tilburg's program for socially responsible business (MVO) includes providing subsidies, networking opportunities, and an annual prize for the leading socially responsible business.

Setting the example with a sustainable purchasing program

Perhaps the biggest contribution that the municipality makes to sustainable production and consumption (including food) is the municipal purchasing program, which increasingly tries to shift purchasing practices to sustainable products and services. While the program is only for the municipal organization, the scale is not minimal, as the municipality of Amsterdam purchases €1 billion worth of goods and services per year. While both municipalities have a sustainable purchasing strategy, Tilburg's is more

focused on socially responsible purchasing and pays less attention to the environmental sustainability and food products.

6.3 Opportunities & barriers to a comprehensive sustainability approach

While the first two questions were focused mostly on the case studies, the final question is meant to be more general, considering what are the opportunities and barriers from implementing such a comprehensive approach at the municipal level. That said, examples from the research will be used to clarify each opportunity or barrier.

3. What are the opportunities and barriers to a comprehensive approach to sustainability at the municipal level? (Descriptive knowledge)

Opportunities for a comprehensive sustainability approach

As a result of this research, a number of opportunities have been revealed for municipalities to approach sustainability comprehensively: (1) urban infrastructure can lay the foundation for a sustainable city, (2) evaluation tools can be used to facilitate more sustainable buildings and developments, (3) proactive targeting of collectives can help raise the standard of sustainability for the existing built environment, (4) a clearly defined sustainability strategy helps improve coordination, but it needs to be balanced and procedures need to be developed to institutionalize the strategy, (5) a strategy combining network building, demonstration projects, and municipal purchasing can influence sustainable production and consumption, and (6) sustainability reporting is necessary to track progress and communicate where more attention is necessary, however reporting needs to be simple to maintain feasibility.

First off, due to the ability to make provisions and exercise authority through strategic planning, the core areas of influence for the municipality are energy, spatial planning, transportation, biodiversity & habitat, water, and waste. With these policy areas, the municipality can lay a foundation for sustainability, making it easier for other parties to build upon a solid infrastructure. For energy in particular, additional strategic planning can help facilitate more optimal distribution of sustainable energy systems, for example finding the right balance between a municipal district heating and cooling system in combination with building or area-based geothermal solutions.

Cities are dynamic, often in a state of development, degradation, and redevelopment. The municipality has an opportunity to infuse sustainability into the development and redevelopment phases of this cycle by incorporating evaluation tools such as 'GPR Gebouw' or BREEAM in the process of area development. Using these tools, goals can be set for sustainability performance and results can be monitored. Choosing the right tool for the task is important, whereas BREEAM is used in Amsterdam to recognize the highest levels of achievement, GPR Gebouw has been more easily incorporated into the standard building process in Tilburg. Newer tools such as 'BREEAM Gebied' and 'GPR Stedenbouw', take a broader area into account and provide an opportunity for a more integrated evaluation of sustainability reaching beyond the building scale. As these tools are new, experience must be gained in the selection of an area and the coordination and responsibility for the process, as these systems have a greater chance of including many additional actors than building-specific tools. Also, when the municipality is the property owner, tenders designed to create competition around sustainability quality can stimulate market parties into raising the quality bar.

As for existing buildings, municipalities can do develop proactive and targeted strategies by looking for opportunities to work with actors who own multiple properties and establishing covenant agreements, for example with social housing corporations. Keeping track of energy efficiency scores, energy labels, and GPR scores helps the

municipality focus in on groups of buildings needing improvement and setting goals and criteria for the covenant agreements.

Having a clear sustainability strategy is an effective means of communicating the goals and ambitions at both the municipality and the project development level. One area in particular that could use more attention in these strategies is social equity – considerably more attention is currently given in regards to the environmental and economic benefits and even when more social benefits are discussed, such as the development of cultural diversity and improvements to health and wellness, equity is not emphasized. Also, more could be done to integrate and institutionalize the efforts being done by municipal sustainability and climate initiatives into the cities most important urban development projects. Formalizing communication and reporting structures could help to create better consistency between the two levels.

For areas such as Production & consumption and Food & agriculture where municipal influence is particularly low, key strategies are to facilitate networking and creating forums for communication, establishing demonstration projects, and setting the example through sustainable purchasing programs within the municipal organization. Through these efforts, the municipality can help set the agenda and help stimulate interest and generate ideas for collective projects such as car-sharing, collective purchasing of solar panels, etc. Purchasing programs help by stimulating the market for sustainable products, making those products more competitive and available over time.

Another opportunity is for the simplification of sustainability reporting. Current efforts at reporting have either been too complex, making it infeasible to maintain or too high level, only focusing on accomplishments. A more performance-oriented report would be more beneficial – with key indicators, for both long and short-term timeframes, specifically including project metrics so that progress can be measured and results can be compared (Corfee-Morlot et al., 2009; Holman, 2009; Rydin et al., 2003; Wheeler, 2000). Reporting can also present an opportunity for the municipality to communicate where it needs help meeting sustainability ambitions. By using sustainability reporting to measure the performance of the municipality in terms of meeting stated goals, clear strengths and weaknesses of the program could be highlighted and gaps identified. Transparency in reporting could then help communicate where the municipality is focusing its resources and where other actors are needed – whether that be used to recruit the involvement of external actors or other levels of government.

Barriers to a comprehensive sustainability approach

In an effort to try to identify barriers to successful implementation of climate policy, institutional capacity and political struggle at the municipal level have been cited in the literature as two key barriers (Bulkeley, 2010; Sippel & Jensen, 2009). Institutional capacity is a broad term, often including elements of financial, human, and organizational capacity to act. While this research looked broader than climate policy alone, sustainability policy can reasonably suffer from the same challenges. The key barriers found in this research are directly related to political and institutional capacity issues: (1) limited political will to take on controversial behavioral and consumption issues and (2) budget cutbacks negatively affecting the institutionalization of sustainability programs,

Political willingness to take on behavioral and consumption issues

Reflecting on this research in terms of political struggle at the municipal level, there was little specific mention of conflict in either case study. There was, however, a noticeable reluctance to become overly involved in issues of behavioral and consumer choice ranging from the choice of transportation mode, consumption of sustainable products, or lifestyle choices such as diet and health. In terms of the case studies, Amsterdam goes

further than Tilburg. Amsterdam has a clear desire to reduce automobile use in favor of alternative modes of transportation, whereas Tilburg tries to be more balanced and remain an appearance of high accessibility to all transportation modes. In regards to consumption, Amsterdam has experience promoting a local and sustainable food program. Although it was not renewed when initial funds expired, the program helped get sustainable food on the agenda and there have been several private initiatives following the municipal program. Tilburg on the other hand, has limited its efforts to supporting socially responsible businesses and purchasing strategies and has not concentrated its efforts on consumer choice. For Tilburg, the first step for Food & agricultural policy would be to get it on the agenda. While both cities actively address minimizing waste and promoting reuse and recycling where possible, the idea of addressing sustainability by curbing over-consumption is avoided and remains controversial.

Budget cutbacks threatening institutional capacity of sustainability programs

Perhaps the bigger political issue was the effect of national budgetary policy on municipal programs, as the need to cut budgets has impacted the municipality's institutional capacity to maintain resource-heavy sustainability or climate programs. One answer to this challenge has been to embed sustainability within the organization, therefore reducing or eliminating the need for dedicated sustainability resources. This is a risky proposition.

Both Amsterdam and Tilburg recently realigned their sustainability and climate programs, by moving them out from under the environmental department (Amsterdam) or a stand-alone program (Tilburg) and under the department of spatial planning and development. This move is an effort to embed these programs into core municipal functions. On one hand, it seems logical that these programs are moving under the spatial planning and development department, as this research has showed, many of the sustainability policy areas can be directly influenced by municipal spatial planning. If the spatial planning department gives sustainability a high priority, it has the potential to offer residents and businesses a sustainable infrastructure and make the goal of sustainable living and working easier to attain.

While this may be good for longevity, the risk is that the attention that sustainability receives from within these departments competes with other issues such as economic and population growth that can present short-term needs that may supersede those of long-term sustainability. The sustainability program serves more of a strategic function, focusing on how to engage and enable individuals, businesses, and other organizations to contribute to sustainability, especially paying attention to areas where spatial planning's influence is more limited (existing buildings, cultural & historical, health & wellness, production & consumption, food & agriculture) and where the municipality's current provision, authority and enabling efforts do not go far enough to meet the ambition of furthering sustainability. Effectively staffed and organized, the sustainability program can initiate new projects and experiment with innovative new procedures to increase sustainability, which could then later be embedded and institutionalized within the organization. The other key role for the sustainability program could be to coordinate sustainability reporting and audit the work of the internal departments, ensuring that embedded procedures continue to be used and improved as necessary. Therefore, even when embedding sustainability procedures in the spatial planning department, there remains considerable work for sustainability-focused resources within the municipality, which would be threatened if a lack of resources restrained capacity.

In order to maintain this focus on sustainability and climate, Amsterdam will maintain its programs within the new organization structure, albeit with fewer resources, impacting its ability to manage its own projects and maintain detailed reporting. Tilburg, on the other hand, is suffering more under the budget cutbacks. With municipal funding under

pressure and national SLOK funding expiring, the climate program is in jeopardy. Tilburg's solution is to externalize its climate program, bringing it under a regional network organization external to the municipal government. This may in fact be a good strategy for many cities that would otherwise lose their sustainability or climate-focused resources when SLOK funding expires, however the challenge of maintaining funding for such an organization remains. It would be interesting to study how these strategies eventually affect the institutional capacities of these initiatives as they develop in the future.

Chapter 7: Conclusions & Recommendations

After the detailed discussion presented in the previous chapter, the intent of this chapter is to return to a higher level. In doing so, the central research question will be answered. This will be followed by a reflection on this research's contribution to the literature and a reflection on the research methodology. This concluding chapter will close with recommendations for additional research.

7.1 Implementing a comprehensive approach to sustainability

Central research question: *To what extent are municipalities capable of implementing a comprehensive approach to sustainability and what factors account for this?*

The capability of the municipality to implement a comprehensive approach lies in their ability to develop procedures that support that objective. This starts with the sustainability strategy and flows through to its institutionalization, procedures for networking, and the use of instruments and tools to help evaluate and track performance. Here is a summary of procedures identified in this research that can help facilitate the implementation of a comprehensive approach to sustainability:

- A broad sustainability strategy, not only at the municipal level, but also for developments
- Evaluation tools that take a broad approach to sustainability (BREEAM, GPR) in order to provide a consistent way of testing design proposals and the performance of urban development
- Inventorization of data from evaluation tools to build knowledge of the city and help develop a targeted approach to the existing built environment
- Experimentation with new and innovative procedures (sustainability tender process, covenant agreements)
- Setting up and staying involved in networks to create forums for participation, stimulate cooperative projects, and raise awareness
- Implementing sustainability criteria for municipal purchasing programs
- Setting targets and reporting performance – both at the municipal level and within urban developments in order to make comparisons and develop best practices

Of course it is not assumed that developing such procedures is easy or that they will come without political resistance. As municipal budgets continue to be pushed in a downward direction, it is especially important to standardize procedures for use by traditional municipal functions. In this way, it's through the implementation of these procedures that sustainability is imbedded into the municipality's processes and organization. Also, networking is an important capacity builder, essentially leveraging the capacity of external organizations to contribute towards collective sustainability initiatives. By developing such procedures, and especially doing so with a comprehensive approach in mind, the ability to achieve consistent outcomes across the full range of sustainability policy areas is improved.

Also, by emphasizing procedures as the key to a comprehensive approach, it puts the emphasis on process and allows the content of that approach to be dynamic. New issues will inevitably come up on the sustainability agenda and any approach that calls itself comprehensive needs to be flexible enough to expand and contract as issues come and go. In this research there is a clear difference in maturity among the different policy areas - for example, water policy in the Netherlands has a long history in comparison to the newer policy area focusing on production and consumption issues, especially for sustainable and locally produced food. Therefore it is not surprising that municipalities are still finding their way when it comes to providing an approach to improve the sustainability of the urban food and agriculture system.

7.2 Reflections on theory and literature

As outlined in the opening chapter, much of the literature on sustainable urban development focused on the municipality either through the lens of Local Agenda 21, with a heavy emphasis on participation processes and a lack of attention to detailed policy areas or through the lens of Local Climate Policy, which tends to neglect a broader definition of sustainability. Especially in the Netherlands, where the momentum behind LA21 initiatives has waned, this research makes a contribution to the literature by building upon a concept of local climate policy research – namely ‘modes of governing’ – and applies it to a broader range of sustainability themes, trying to gain a more detailed perspective of how municipal strategies can influence these themes to various extents across more policy areas.

Returning to the research on Modes of Governance (Alber & Kern, 2008; Bulkeley & Kern, 2006), the key conclusions were that the use of authority was not found as often as expected, most measures were either in the form of self-governing or through enabling, and provision is on the decline due to liberalization of the energy markets and the tendency to avoid unpopular planning measures. These conclusions can only be supported in part by the case studies of Amsterdam and Tilburg.

By expanding the framework to analyze a broader sustainability context, several additional policy areas were added in this study (the original model included energy, spatial planning, transportation, and waste). The case studies showed that a strong culture of spatial planning and good relationships with the local utilities has in fact made it possible for provision to remain a key lever for municipalities in the Netherlands by partnering with utilities for the provision of district heating and cooling, transportation infrastructure, biodiversity, water infrastructure, and waste management systems. In doing so, enabling measures can build on this foundation and further influence the utilization of this infrastructure and additional efforts towards improving sustainability. To a lesser extent, provision also played a role in stimulating cultural heritage and health and wellness. The two areas that seemed most limited in potential for provision were production & consumption and food & agriculture, with efforts limited to the provision of space for markets and events and limited subsidies or support for startups and SMEs.

As in the Alber & Kern study, opportunities for authority were often limited, with most examples of authority used for enforcing minimum quality standards or exercised through zoning regulations. However there were more examples where authority played an important role, for example in areas where authority was used to help the municipality collect information on existing buildings or to negotiate covenant agreements. For all areas, enabling and self-governing efforts make up a large portion of the municipal contribution towards sustainability. As a result of this study, the Modes of Governing table used by Alber & Kern has been updated with these examples and the additional policy areas in Table 7.1 below. The bolded text represents the original framework from Alber & Kern, bold with italics signifies where the original text was edited for the broader context of sustainability, and the normal text are the additions based on this research.

Modes of Governing for Sustainability				
<u>Policy areas</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Energy	<p>Energy efficiency schemes and use of CHP (or district heating & cooling) within municipal buildings</p> <p>Procurement of energy-efficient appliances</p> <p>Purchasing of green energy</p> <p>Eco-house and renewable energy demonstration projects</p>	<p>Campaigns for energy efficiency</p> <p>Advice on energy efficiency to businesses and citizens</p> <p>Promotion of the use of renewable energy</p> <p>Establish multi-actor organization for the purpose of pursuing local energy solutions</p> <p>Create procedures to encourage competition on energy-efficient design</p> <p>Establishing building norms or encourage certifications such as BREEAM</p>	<p>Clean energy service provision (incl. district heating and cooling)</p> <p>Energy service companies</p> <p>Provision of incentives and grants for energy-efficiency measures</p>	<p>Strategic energy planning (or visions)</p> <p>Ordinances on the mandatory use of renewable energy (incl. district heating & cooling)</p> <p>Energy efficiency requirements in zoning ordinances (or building code)</p> <p>Mandatory energy labeling for buildings</p>
Spatial & land-use planning	<p>High energy-efficiency standards and use of CHP (or district heating & cooling) in new public buildings</p> <p>Demonstration projects – house or neighbourhood scale.</p>	<p>Guidance for architects and developers on energy efficiency and renewables</p> <p>Document sustainability strategy and use in negotiations with potential land developers</p> <p>Establish a processes for creating competition on sustainability when bidding for land development (sustainability tender)</p> <p>Establish multi-actor organization for collaborating on spatial planning strategies</p>		<p>Strategic land use planning to enhance sustainability</p> <p>Planning of sites for renewable installations</p> <p>Strategic land-use planning to enhance use of public transport, bicycles, and walking</p> <p>Enforcing or changing of zoning regulations to promote desired development outcomes</p> <p>Use of financial tools and leases ('erfpacht') to retain strong ground position for municipally-owned or acquired land</p>

Modes of Governing for Sustainability				
Policy areas	Self-governing	Governing through enabling	Governing by provision	Governing by authority
Mobility & transportation	<p>Mobility management for employees</p> <p>Green fleets</p>	<p>Education campaigns</p> <p>- Incl. promotion of public transport, bicycle-use, electric vehicles, & car sharing</p> <p>Green travel plans</p> <p>Quality partnerships with public transport providers</p> <p>Participation in sustainable business clubs to encourage sustainable transport (covenant agreements?)</p>	<p>Public transport service provision</p> <p>Provision of infrastructure for alternative forms of transport</p> <p>-incl. bike paths, walkways, & EV charging stations</p> <p>Logistics centres for goods transport</p> <p>Provision of subsidies for electric vehicles</p>	<p>Transport planning to limit car use and provide walking and cycling infrastructure</p> <p>- Include regulations for freight vehicles in zoning plan/decisions</p> <p>- Include regulations for the provision of limited onsite parking</p> <p>Workplace levies and road-user charging</p>
Waste	<p>Waste prevention, recycling, and reuse within the local authority</p> <p>Procurement of recycled goods</p> <p>Environmentally efficient waste collection vehicles</p> <p>Staff training programs</p>	<p>Campaigns for reducing, reusing and recycling waste (incl. waste separation)</p> <p>Promotion of the use of recycled products</p> <p>Use of building tools to minimize waste and promote reuse (GPR Gebouw, BREEAM)</p>	<p>Waste service provision</p> <p>Installations for recycling, composting and 'waste to energy' facilities</p> <p>Recycling, composting and reuse schemes</p>	<p>Regulations on methane combustion from landfill sites</p> <p>Regulations for the proper disposal of hazardous waste</p>
Biodiversity & habitat	Build/renovate municipal buildings to include green roofs, courtyards, and trees	<p>Promotion of green roofs, walls, and other landscaping (incl. subsidies)</p> <p>Encourage more comprehensive certifications such as 'BREEAM Gebied'</p>	<p>Provision of public green space</p> <p>Provision of trees and greening along streets and waterfront (canals)</p>	<p>Establish regulations for removal of trees or green space</p> <p>Use of building permit process to address ground pollution cleanup</p> <p>Renegotiate rights to waterfronts and along streets where possible</p>
Water	Use of water management efficiency measures in own facilities	Promote water efficient building design through tools such as BREEAM, GPR	Provision of municipal water system – drainage, sewage, and drinking water	Regulations for water quality, runoff, and flood safety

<u>Modes of Governing for Sustainability</u>				
<u>Policy areas</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Building retrofits	Renovation of existing municipal properties using sustainability evaluation tools to provide examples	Promote tools such as GPR, BREEAM focused on existing buildings or renovations	Provision subsidies/support for improving sustainability improvements - energy efficiency, solar panels, green/blue roofs, water efficiency	Covenant agreement with large collectives to inventory energy or sustainability rating and make improvements Building energy label requirements (enforced during sale, purchase, or major renovation) Enforce standards of latest building codes with renovations through building permits Create flexible zoning to enable repurposing of buildings
Production & consumption	Municipal purchasing program	Participate in sustainable business & innovation organizations and promote their efforts Provide sustainability support desk/organization for smaller businesses Promotion of Fair Trade and other labels	Provision of space for sustainable product markets and events Subsidies/support for sustainable startups & SMEs	
Food & agriculture	Municipal purchasing programs for sustainable and locally sourced catering	Municipal program for the promotion of sustainable food Encourage the use of vacant land available for alternative uses when idle	Provision of space for locally and sustainably produced food markets and events	Remove barriers, such as adjusting land-use plans, to make way for innovative initiatives

Modes of Governing for Sustainability				
<u>Policy areas</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Cultural & historical		Creating a cultural-historical vision & encourage its fulfillment Promotion of cultural & historical events Promotion of evaluation tools that place value on cultural and historical criteria (GPR & BREEAM Gebied)	Partnering with local educational and cultural institutions to create cultural facilities Establish a cultural program for the purpose of developing culture & historical offerings	Protection of monument sites & buildings
Health & wellness	Design of municipal facilities to consider health and wellness factors Reduce air pollution by improving municipal vehicle fleet	Promote evaluation tools and selection procedures that place value on health & wellness Promote temporary use of otherwise unused property to avoid dead spaces Promote sustainable transportation and active lifestyles to improve health and reduce air pollution`	Noise dampening structures in roadway/railway construction (move infrastructure underground) Municipal lighting along streets, waterfront and public space to enhance safety Provision & design of public space	Regulations for noise and air pollution levels Mixed-use zoning for diversity and vitality

Table 7.1: Modes of governing for sustainability - adaptation & expansion of Alber & Kern (2008, p. 6)

7.3 Reflecting on the research methodology

To reflect on the methodology used, observations will be made in regards to the effectiveness on the methodology for reaching the research objectives. The research objectives as stated in the opening chapter were as follows:

By making an assessment of approaches taken by leading Dutch municipalities, the objectives of this research are three-fold:

- 1. To investigate the extent to which Dutch municipalities are striving for comprehensive approaches to sustainability*
- 2. To articulate the local authority's role and strategy taken for the policy areas addressed in their initiative*
- 3. To investigate the opportunities and barriers to implementing comprehensive sustainability initiatives at the municipal level*

A combination of literature review and case studies were used to meet these objectives, which is a common approach used in local climate policy research (Alber & Kern, 2008; Betsill & Bulkeley, 2006, 2007; Bulkeley & Kern, 2006; Burch, 2010). The literature review consisted of a combination of academic literature and municipal planning and policy documents. After selecting cities for the case studies, development projects were sought out to determine whether or not the municipal's sustainability goals and program were also present in the municipality's development projects.

The original intent of the first objective was actually to do desk research on the Netherland's largest 20 or 30 cities and make a high level analysis of the breadth of their sustainability programs. Unfortunately, due to the fact that only the biggest cities offered such documentation in English and the fact that a wide range of documents needed to be consulted in order to get an accurate picture of the breadth of their program, it was deemed not feasible given the time available. Had time allowed, it would perhaps have been more efficient if this were done in combination with a survey, getting responses from municipal workers as to what their program included and then letting them identify the appropriate documents for review.

Instead, the approach taken was to first identify which of the Netherland's cities were leading in terms of sustainability based on expert interviews. Once identified, a selection was made deliberately choosing one large city and one medium-sized city, which were then studied to see how broad of an approach was taken as a proxy for the front-running cities. The evaluation process even for these two cities was more time consuming than expected. This was due to the amount of themes that were being assessed, touching on different municipal departments and programs, which each organized their information in a differently. As the data collection for Tilburg took place after Amsterdam, this process was streamlined by presenting an overview of which documents had been consulted to representatives within the municipality and having them react to the material used and whether there were additional materials that would be of use.

In the end, it was hard to attribute the differences between Amsterdam and Tilburg based on municipality size. On the one hand, capacity seemed to be more of an issue in Tilburg, which led it to choose a strategy that leveraged networks and relied on external actors and perhaps limited their ability to be more proactive in efforts to influence policy areas of food and agriculture or production and consumption. However on the other hand, the differences between the two cities could also trace back to their strategic approaches: that is the broad sustainability approach of Amsterdam in comparison to a more climate-led approach in Tilburg. In order to see the effects of different cities, it would be better to compare a city like Tilburg, that focuses more on climate to a larger city with a similar approach, such as Rotterdam.

Since the other two objectives were contained within the case study analysis, these were more straightforward to address. By using different types of governing to articulate the municipality's role, it helped to draw out the strategy being deployed by the municipality. For example, in some cases, enabling was used as a supplement to provision to increase the use of municipally provided infrastructure or services where the municipality's authority did not reach far enough. In other cases, enabling was the only approach available since the municipality had no effective means of providing or using authority. By identifying the municipality's efforts of governing for each policy area, these dynamics were brought to attention.

In addition, while other research used the municipal level as the lowest level for this type of analysis (Alber & Kern, 2008; Bulkeley & Kern, 2006), analyzing specific development projects within the municipality proved an effective way to get tangible examples of how the municipality engages in the different policy areas and provided an opportunity to evaluate the extent of the integration of the policy areas and helped place extra emphasis on the role of spatial planning. Ideally, the analysis would have been taken in two stages, first conducting the full evaluation of each element of the comprehensive sustainability framework at the municipal level and then comparing that to the analysis that was done at the project level. Unfortunately, due to time and resource constraints, the detailed analysis was only completed on the project level.

7.4 Recommendations for further research

Since this research focused on a high level analysis across a broad spectrum of criteria, many interesting topics emerged that could not be investigated in considerable depth. This is especially relevant for the procedures that were discovered during the case studies, and also for the study of collective initiatives. In addition to these detailed studies, it would also be interesting to apply the analytical framework to additional case studies both nationally and internationally to provide more robust results.

Areas that stand out for the in-depth analysis are the use of the new area based evaluation tools (BREEAM Gebied, GPR Stedenbouw), covenant agreements, municipal sustainability reporting, the study of collective initiatives and network organization. Since the area based evaluation tools are so new, there is not yet very much experience with their implementation. Important questions regarding their use would be what are the organizational process implications, how effective are they, and what are the strengths and weaknesses of different tools. For covenant agreements, it would be interesting to know more about how the agreement is structured and how effective they are in achieving the desired results. In addition, it would be interesting to identify other collectives (in addition to social housing corporations) that could be pursued with covenant type agreements. Sustainability reporting is still struggling to become sustainable in its own right, therefore it would be interesting to do a detailed study of municipal reporting initiatives to better understand which indicators are being reported, what are the procedures for promoting, and how effective are the reports for improving the municipal initiatives.

Another big challenge for urban sustainable development remains how to effectively organize collective initiatives, especially if the government is not in the lead. Tilburg is dealing with this issue as they are trying to establish the Klimaatschap and the climate program outside the municipality. Tilburg will remain an interesting case and could be compared to other cities trying to take a similar approach in order to understand what models are being chosen and what are the success factors for establishing and maintaining the organization. While Tilburg is further in the process, the same issue is present in the Zuidas as they are seeking to move beyond the disintegrated initiatives of individual companies and trying to organize a collective way to address energy issues for the local area. This same issue is also present in efforts to attain area certifications such as newly established by BREEAM and GPR – since multiple actors have ownership of

different aspects of the area, how is the process organized for attaining certification and making integrated improvements to the area.

Finally, to better understand how sustainability programs are being implemented both in the Netherlands and internationally, more case studies are needed. These case studies could help further validate the analytical framework developed in this research and also to see if the strategies that emerged are similar or differ based on different sizes or national contexts. Most cities in the Netherlands do not have the resources available as cities such as Amsterdam and Rotterdam, therefore it would be interesting to focus on cities of medium-size to see how they can learn from each other and deploy effective strategies given their more limited resources.

References

Aalborgplus10.dk. (2010). Participants of The European Sustainable Cities & Towns Campaign: Signatory local authorities of the Aalborg Charter. Retrieved March 21, 2011, from http://www.aalborgplus10.dk/media/short_list_14-12-2010.pdf

Afval.amsterdam.nl. (2011). Afval schieden werkt! Retrieved October 31, 2011, 2011, from <http://www.afval.amsterdam.nl/campagnes/>

Afvalenergiebedrijf.nl. (2011). Afval Energie Bedrijf. Retrieved October 31, 2011, 2011, from <http://www.afvalenergiebedrijf.nl/>

AIMsterdam.nl. (2011). Amsterdamse Innovatie Motor. Retrieved November 3, 2011, 2011, from <http://www.aimsterdam.nl/over-AIM>

Alber, G., & Kern, K. (2008). *Governing Climate Change in Cities: Modes of Urban Climate Governance in Multi-level Systems*. Paper presented at the Competitive Cities and Climate Change Conference, Milan, Italy.

Amsterdam.nl. (2011a). Amsterdam Bespaart Energie. Retrieved November 30, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/energie-besparen/amsterdam-bespaart/>

Amsterdam.nl. (2011b). Amsterdam Smart City wint Europese prijs voor 'Promoting sustainable energy in cities'. Retrieved November 3, 2011, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/actueel/nieuwsbrief/2011/kopie-nieuwsbrief/@429769/amsterdam-smart-city/>

Amsterdam.nl. (2011c). Bestaande woningen. Retrieved November 30, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/energie-besparen/bestaande-woningen/bw/bestaande-woningen/>

Amsterdam.nl. (2011d, July 26, 2011). Corporaties. Retrieved November 30, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/energie-besparen/bestaande-woningen/bw/corporaties/>

Amsterdam.nl. (2011e). Opnieuw subsidieregeling voor groene daken en groene muren. Retrieved October 26, 2011, 2011, from <http://www.amsterdam.nl/toerisme-vrije-tijd/groen-natuur/actueel/opnieuw/>

Amsterdam.nl. (2011f, July 12, 2011). Particuliere organisaties nemen initiatief tot energiebesparing in de huursector. Retrieved November 30, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/energie-besparen/bestaande-woningen/bw/particuliere-verhuur/@434555/particuliere/>

Amsterdam.nl. (2011g). Particuliere verhuur. Retrieved November 30, 2011, from <http://www.amsterdam.nl/wonen-leefomgeving/klimaat-energie/energie-besparen/bestaande-woningen/bw/particuliere-verhuur/>

Amsterdam.nl. (2011h). Subsidie voor elektrische bezorgscooters in Amsterdam-West. Retrieved September 25, 2011, 2011, from <http://www.amsterdam.nl/parkeren-verkeer/elektrisch-vervoer/elektrisch/nieuwsberichten/@449411/subsidie-elektrische/>

Amsterdam.nl. (2011i). Subsidieregeling elektrische auto's. Retrieved September 25, 2011, 2011, from <http://www.amsterdam.nl/parkeren-verkeer/elektrisch-vervoer/elektrisch/subsidie/>

- Amsterdam.nl. (2011j). Verzoek voor een oplaadpunt. Retrieved September 25, 2011, 2011, from <http://www.amsterdam.nl/parkeren-verkeer/elektrisch-vervoer/elektrisch/oplaadpunt-aanvragen/>
- Amsterdambrightcity.nl. (2011). Amsterdam Bright City. Retrieved October 28, 2011, 2011, from <http://www.amsterdambrightcity.nl/zuidas/nl/community>
- Anguelovski, I., & Carmin, J. (2011). Something borrowed, everything new: innovation and institutionalization in urban climate governance. *Current Opinion in Environmental Sustainability*, 3, 1-7.
- Bd.nl. (2011, April 4, 2011). Spoor moet op 'pootjes' van groep Theresia. Retrieved September 14, 2011, 2011, from <http://bd.nl/xtra/spoorzone/spoor-moet-op-pootjes-van-groep-theresia-1.89664>
- Betsill, M., & Bulkeley, H. (2004). Transnational Networks and Global Environmental Governance: The Cities for Climate Protection Program. *International Studies Quarterly*, 48, 471-493.
- Betsill, M., & Bulkeley, H. (2006). Cities and the Multilevel Governance of Climate Change. *Global Governance*, 12, 141-159.
- Betsill, M., & Bulkeley, H. (2007). Looking Back and Thinking Ahead: A Decade of Cities and Climate Change Research. *Local Environment*, 12(5), 447-456.
- Biemans, P. (2011, August 31, 2011). [Personal Communication].
- Biemans, P., & Kint, R. (2011, July 7, 2011). [Personal Communication].
- Biermann, S. (2000). Bulk Engineering Services: Costs and Densities. In M. Jenks & R. Burgess (Eds.), *Compact Cities - Sustainable Urban Forms for Developing Countries* (pp. 295-310). New York: Spon Press.
- Bloemendal, M. (2011). Personal Communication.
- BREEAM NL. (2011). *Keurmerk voor duurzame vastgoedobjecten - Beoordelingsrichtlijn Nieuwbouw*. Rotterdam: Dutch Green Building Council Retrieved from http://www.dgbc.nl/images/20110803_BRL2011v1.0_BREEAM-NL_NL-2.pdf.
- BREEAM.nl. (2011a). BREEAM Gebied. Retrieved September 22, 2011, 2011, from <http://www.breeam.nl/gebied/>
- BREEAM.nl. (2011b). BREEAM Gecertificeerd Projecten. Retrieved September 22, 2011, 2011, from <http://www.breeam.nl/projecten/nieuwbouw/gecertificeerd>
- BREEAM.nl. (2011c). BREEAM-NL Bestaande Bouw en Gebruik. Retrieved October 31, 2011, 2011, from http://www.breeam.nl/bestaande_bouw/breeam_bestaande_bouw/
- Bulkeley, H. (2010). Cities and the Governing of Climate Change. *Annual Review of Environment and Resources*, 35, 229-253.
- Bulkeley, H., & Kern, K. (2006). Local government and the governing of climate change in Germany and the UK. *Urban Studies*, 43(12), 2237-2259.
- Burch, S. (2010). In pursuit of resilient, low carbon communities: An examination of barriers to action in three Canadian cities. *Energy Policy*, 38, 7575-7585.

Busck, A. G., Hidding, M. C., Kristensen, S. B. P., Persson, C., & Præstholm, S. (2008). Managing rural landscapes in the Netherlands, Denmark and Sweden: Comparing planning systems and instruments in three different contexts. *Danish Journal of Geography*, 108(2), 1-16.

CBS Statline. (2010). Regionale Kerncijfers Nederland: Totale bevolking. Retrieved May 6, 2011, from <http://statline.cbs.nl/>

Coenen, F. (2001). The Netherlands: Probing the essence of LA21 as a value-added approach to sustainable development and local democracy. In W. M. Lafferty (Ed.), *Sustainable Communities in Europe* (pp. 153-179). London, UK & Sterling, VA: Earthscan.

Cohen, B. (2011). Global Ranking of Top 10 Resilient Cities. Retrieved December 1, 2011, from <http://www.triplepundit.com/2011/06/top-10-globally-resilient-cities/>

COM. (2009). *400 final: Mainstreaming sustainable development into EU policies: 2009 Review of the European Union Strategy for Sustainable Development*. Brussels: Retrieved from <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0400:FIN:en:PDF>.

Corfee-Morlot, J., Kamal-Chaoui, L., Donovan, M. G., Cochran, I., Robert, A., & Teasdale, P. J. (2009). Cities, Climate Change and Multilevel Governance. *OECD Environmental Working Papers*, 14.

COS Brabant. (2011a). Duurzaam Inkopen. Retrieved September 13, 2011, 2011, from http://www.cossen.nl/detail_proj.phtml?&username=gast@cossen.nl&password=9999&groups=COSEN&id=WMB&text03_tmp=&text03=WMB&banner=4&workgroup=&act_id=5060

COS Brabant. (2011b). Tilburg wil Fairtrade gemeente worden. Retrieved September 13, 2011, 2011, from http://www.cossen.nl/detail_press.phtml?&username=gast@cossen.nl&password=9999&groups=COSEN&id=WMB&text03_tmp=&text03=WMB&banner=4&workgroup=&act_id=12030

COS Nederland. (2009). *Stand van Zaken November 2009*. Alkmaar: COS Nederland Retrieved from <http://www.google.nl/url?sa=t&rct=j&q=duurzaamheidsmeter%20stand%20van%20zak%202009&source=web&cd=2&ved=0CCQQFjAB&url=http%3A%2F%2Fwww.duurzaamheidsmeter.nl%2Ffile%2F86&ei=zIvXTomzMoHu-gbr8YW2Dg&usq=AFQjCNFc13PgWgHQF3HI999wDeN0jsOHGg&cad=rja>.

de Alliantie. (2010). Prestatieafspraken en covenanten. Retrieved November 30, 2011, from <http://www.de-alliantie.nl/smartsite.shtml?id=8611>

DGBC.nl. (2011). Dutch Green Building Council. Retrieved September 22, 2011, 2011, from <http://www.dgbc.nl/>

Dielman, F. M., Dijst, M. J., & Spit, T. (1999). Planning the Compact City: the Randstad Holland Experience. *European Planning Studies*, 7(5), 605-621.

DMB.Amsterdam.nl. (2010). Total Cost of Ownership - Vergelijking bestratingsmateriaal. Retrieved November 2, 2011, 2011, from http://www.dmb.amsterdam.nl/wat_doet_dmb/milieuadvies/projecten/total_cost_of/

Dormans, S., & Lagendijk, A. (2009). A Narrative Understanding of an Entrepreneurial City: The Case of Tilburg. In B. Arts, A. Lagendijk & H. van Houtum (Eds.), *The Disoriented State: Shifts in Governmentality, Territoriality and Governance* (Vol. 49, pp. 161-180): Spring Science.

Du Pisani, J. A. (2006). Sustainable development - historical roots of the concept. *Environmental Sciences*, 3(2), 83-96.

Duurzaamgebouwd.nl. (2008). Annemarie van Doorn - Interview. Retrieved November 9, 2011, 2011, from <http://www.duurzaamgebouwd.nl/interviews/20080728-annemarie-van-doorn>

Duurzameoverheden.nl. (2011). Klimaatakkoord. Retrieved November 24, 2011, from <http://www.duurzameoverheden.nl/smartsite.dws?ch=pdo&id=88322>

Economist Intelligence Unit. (2009). *European Green Cities Index*. Munich: Siemens AG Retrieved from http://www.siemens.com/entry/cc/features/urbanization_development/all/en/pdf/report_en.pdf.

Energievastgoed.nl. (2011). Annemarie van Doorn (ABN AMRO): "Verduurzamen voorkomt leegstand". Retrieved November 9, 2011, 2011, from <http://www.energievastgoed.nl/2011/07/interview-annemarie-van-doorn-abn-amro-%E2%80%9Cnue-verduurzamen-voorkomt-toekomstige-leegstand/>

Evans, B., Joas, M., Sundback, S., & Theobald, K. (2006). Governing Local Sustainability. *Journal of Environmental Planning and Management*, 49(6), 849-867.

Evans, B., & Theobald, K. (2003). LASALA: Evaluating Local Agenda 21 in Europe. *Journal of Environmental Planning and Management*, 46(5), 781-794.

Fainstein, S. S. (2008). Mega-projects in New York, London and Amsterdam. *International Journal of Urban and Regional Research*, 32(4), 768-785.

Fairtrade Gemeente. (2011). Wat is Fairtrade Gemeente? , from <http://www.fairtradegemeenten.nl/over-ft/wat-is-ftg-2.html>

Fontein, R. J., & Stuiver, M. (2011). *Van A tot Z - Wat kunnen gemeenten doen om duurzaam voedsel te stimuleren*. Ministrie van Economische Zaken, Landbouw en Innovatie Retrieved from <http://www.smakelijkduurzamestad.nl/uploads/pdf/Van%20A%20to%20Z.pdf>.

Frederiks, N. (2010). *Energie Visie Zuidas 2010*. Amsterdam: Retrieved from <http://www.zuidas.nl/sites/default/files/Energievisie%20Zuidas%202010.pdf>.

Frederiks, N. (2011, June 6, 2011). [Personal Communication].

Frederiks, N., & van Eijk, B. (2009). *Duurzaamheidsverslag Zuidas 2008*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.zuidas.nl/sites/default/files/Duurzaamheidsverslag%20Zuidas%202008%20definitief.pdf>.

Frederiks, N., & van Eijk, B. (2010). *Zuidas Amsterdam Jaarverslag Duurzaamheid 2009*. Amsterdam: Retrieved from http://www.zuidas.nl/sites/default/files/Zuidas_Amsterdam_Jaarverslag_Duurzaamheid_2009.pdf.

Frenken, D. (2011, July 1, 2011). [Personal Communication].

Garcia-Sanchez, I. M., & Prado-Lorenzo, J.-M. (2008). Determinant Factors in the Degree of Implementation of Local Agenda 21 in the European Union. *Sustainable Development*, 16, 17-34.

Gemeente Amsterdam. (2003). *Noord aan het IJ: Masterplan Noordelijke IJ-oever*. Amsterdam: Retrieved from <http://www.noord.amsterdam.nl/Docs/beeldvannoord/projecten/ijoever/IJ-Oevers-deel1.pdf>.

Gemeente Amsterdam. (2004). *Visie Zuidas: stand van zaken 2004*. Amsterdam: Retrieved from http://connectedcities.eu/downloads/showcases/nsp_zuidas_visie.pdf.

Gemeente Amsterdam. (2005). *MER Herinrichting Buiksloterham/Overhoeks te Amsterdam*. Amsterdam: Retrieved from [http://www.bestemmingsplannen.amsterdam.nl/docs/BPN/N002nd/15%20-%20MER%20Herinrichting%20Buiksloterham-Overhoeks%20te%20Amsterdam%20\(mei%202005\).pdf](http://www.bestemmingsplannen.amsterdam.nl/docs/BPN/N002nd/15%20-%20MER%20Herinrichting%20Buiksloterham-Overhoeks%20te%20Amsterdam%20(mei%202005).pdf).

Gemeente Amsterdam. (2006). *Duurzaamheidsverslag 2005*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.amsterdam.nl/publish/pages/364672/2005nlduurzaamheidsverslagvolledig.pdf>.

Gemeente Amsterdam. (2007). *Zuidas Visie*. Amsterdam: Gemeente Amsterdam Retrieved from http://www.irenebuurt.nl/zuidas_prospectus/images/ZA.U.07.105_BIJLAGE5_VisieZuidas.pdf.

Gemeente Amsterdam. (2008). *Duurzaamheidsplan Zuidas*. Amsterdam: Retrieved from http://www.zuidas.nl/sites/default/files/Zuidas_Duurzaamheidsplan_LR_2.pdf.

Gemeente Amsterdam. (2009a). *Amsterdam in 2020*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.dmb.amsterdam.nl/publish/pages/317667/amsterdamin2020english.pdf>.

Gemeente Amsterdam. (2009b). *Bestemmingsplan Buiksloterham*. Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/142749/20091216vastgesteldbestemmingsplanbuiksloterham.pdf>.

Gemeente Amsterdam. (2009c). *Inschrijfprocedure Definitieve Selectie Duurzaamheidstender Buiksloterham: Bouwveloppen 12, 21, 22, 24, 41*. Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/146165/inschrijfbrochuredefinitieveselectieduurzaamheidstenderbuiksloterham.pdf>.

Gemeente Amsterdam. (2009d). *Inschrijfprocedure Voorselectie Duurzaamheidstender Buiksloterham: Bouwveloppen*. Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/146165/inschrijfbrochurevoorselectieduurzaamheidstenderbuiksloterhamgewijzigdeversiedd2oktober2009.pdf>.

Gemeente Amsterdam. (2009e). *Zuidas Visie*. Amsterdam: Retrieved from http://www.zuidas.nl/sites/default/files/IMCE/20091020_visie%20zuidas_beeldschermversie.pdf.

Gemeente Amsterdam. (2010a). *Bestemmingsplan Kop Zuidas*. Amsterdam: Retrieved from http://www.zuidas.nl/sites/default/files/Vastgesteld%20bp%20Kop%20Zuidas_regels%20en%20toelichting,%2021%2001%202010.pdf.

Gemeente Amsterdam. (2010b). *Duurzame leven in een compacte stad*. Gemeente Amsterdam: Retrieved from <http://www.amsterdam.nl/publish/pages/20174/duurzaamheidverslagsamenvatting2008-2009.pdf>.

Gemeente Amsterdam. (2010c). *Energiestrategie Amsterdam 2040*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.amsterdam.nl/publish/pages/265293/2010.02.01rapportcedelftdefinitief.pdf>.

Gemeente Amsterdam. (2010d). *Leidraad Duurzaam Inkopen 2 - Amsterdam kiest voor duurzame inkoop*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.dmb.amsterdam.nl/publish/pages/291680/leidraadduurzaaminkopen2.pdf>.

Gemeente Amsterdam. (2010e). *Programma Proeftuin Amsterdam*. Amsterdam: Retrieved from <http://www.proeftuin.amsterdam.nl/publish/pages/269269/publieksversieprogrammaplaproeftuinamsterdamv3kort.pdf>.

Gemeente Amsterdam. (2010f). *Zuidas 15 by 15*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.zuidas.nl/sites/default/files/Folder%20Zuidas%20NED.pdf>.

Gemeente Amsterdam. (2011a). *Amsterdam Beslist Duurzaam: Duurzaamheidsprogramma 2011-2014*. Amsterdam: Retrieved from http://www.amsterdam.nl/publish/pages/20174/duurzaamheidsprogramma_def_def.pdf.

Gemeente Amsterdam. (2011b). *Amsterdam elektrisch*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.amsterdam.nl/parkeren-verkeer/elektrisch-vervoer/elektrisch/publicaties/documenten/folder-amsterdam/>.

Gemeente Amsterdam. (2011c). *Bestemmingsplan Studentenhuisvesting Ravel*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.zuidas.nl/sites/default/files/2.%20Concept-ontwerpbestemmingsplan%20%E2%80%98Studentenhuisvesting%20Ravel%E2%80%99%20d.d.%2021%20september%202011.pdf>.

Gemeente Amsterdam. (2011d). *Bestemmingsplan VU medisch centrum (en omgeving) - ONTWERP BESTEMMINGSPLAN*. Amsterdam: Gemeente Amsterdam Retrieved from [http://www.zuidas.nl/sites/default/files/BP%20VU%20mc%20\(e.o.\)%20zonder%20bijlagen.pdf](http://www.zuidas.nl/sites/default/files/BP%20VU%20mc%20(e.o.)%20zonder%20bijlagen.pdf).

Gemeente Amsterdam. (2011e). *Factsheet Buiksloterham 2011*. Amsterdam: Gemeente Amsterdam Retrieved from http://www.noordwaarts.nl/publish/pages/142749/bsh_2011.pdf.

Gemeente Amsterdam. (2011f). *Het is duurzaam aan de top*. Amsterdam: Retrieved from <http://www.amsterdam.nl/publish/pages/39667/eindconceptamsterdamduurzaammandetop.pdf>.

Gemeente Amsterdam. (2011g). *Jaarrekening. Directie Concern Financien*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.amsterdam.nl/gemeente/pers/financien/jaarrekening/>.

Gemeente Amsterdam. (2011h). *Milieubeleidsplan 2011-2014*. Amsterdam: Retrieved from http://www.zuid.amsterdam.nl/publish/pages/265666/milieubeleidsplan_zuid_2011-2014_definitief.pdf.

Gemeente Amsterdam. (2011i). *Plan Amsterdam: Transformatie Noordelijke IJever*. Amsterdam: Retrieved from <http://www.dro.amsterdam.nl/publish/pages/361829/plan05-2011-02.pdf>.

Gemeente Amsterdam. (2011j). *Structuurvisie Amsterdam 2040: Economisch sterk en duurzaam*. Amsterdam: Retrieved from http://www.dro.amsterdam.nl/over_dro/dro_werkt_aan/bijzondere_projecten/structuurvisie.

Gemeente Amsterdam. (2011k). *ZIPS: Zuidas Integrated Placemaking Strategy*. Amsterdam: DRO/ARUP.

Gemeente Amsterdam. (n.d.-a). *De Kameel van Noord: Heddes Vastgoed, op ten noort blijdenstein architecten en adviseurs, Deerns raadgevende Ingenieurs*. Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/259931/509733banner3.pdf>.

Gemeente Amsterdam. (n.d.-b). *Keep it Simple, Back to basics in Buiksloterham: GTP Vastgoed B.V., TEKTON Architecten en AMIC Installation Consultancy B.V.* Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/259931/509733banner1.pdf>.

Gemeente Amsterdam. (n.d.-c). *Vink Bouw in samenwerking met*

Marcel Lok architect. Amsterdam: Retrieved from <http://www.noordwaarts.nl/publish/pages/259931/509733banner2.pdf>.

Gemeente Tilburg. (2005a). *Structuurvisie Spoorzone*. Tilburg: Retrieved from <http://www.tilburgspoorzone.nl/getmedia/c88f8e46-92d0-4c31-9a66-af0291d85164/strucplansprzn210305.pdf>.

Gemeente Tilburg. (2005b). *Tilburg: stad van contrasten*. Tilburg: Retrieved from http://www.tilburg.nl/gemeente/ep/channelView.do?channelId=-11421&programId=14733&pageTypeId=9960&contentTypeId=1001&displayPage=%2Fep%2Fchannel%2Ftl_channel_related_content.jsp&relCntPage=%2Fep%2Fcontent%2Ftl_ed_ar_content.jsp&contentId=23452.

Gemeente Tilburg. (2008a). *Bestemmingsplan Spoorzone: Toelichting en Voorschriften*. (Code 2007-008). Tilburg: Retrieved from <http://www.tilburgspoorzone.nl/getmedia/ef6cb0ac-a14b-4544-b30b-cf213f9f0655/spoorzone-toelichting-voorschriften>.

Gemeente Tilburg. (2008b). *Eerste Klimaatprogramma Tilburg: Naar een klimaatneutrale en klimaatbestendige stad*. Tilburg: Retrieved from <http://www.milieucafe.nl/media/documents/klimaatprogramma-tilburg-2009-2012-november-2008.pdf>.

Gemeente Tilburg. (2010a). *2040_*. Tilburg: Retrieved from http://www.tilburg.nl/bpmapp-upload/download/fstore/9107105412011d1c_86c347_126fe7c7875_-1b28/Tilburg2040.pdf.

Gemeente Tilburg. (2010b). *Structuurvisie Noordoost 2020*. Tilburg: Gemeente Tilburg Retrieved from <http://www.tilburg.nl/bpmapp>

[upload/download/fstore/9107105412011d1c_86c347_126880ef102_-32b7/rapport-structuurvisie-noordoost-2020.pdf](http://www.tilburgspoorzone.nl/upload/download/fstore/9107105412011d1c_86c347_126880ef102_-32b7/rapport-structuurvisie-noordoost-2020.pdf).

Gemeente Tilburg. (2011a). *De Werkplaats: Masterplan Spoorzone - Tilburg*. Tilburg: Retrieved from http://www.tilburgspoorzone.nl/getmedia/84dcf020-7f95-4579-a748-660fb1dbe7e7/Masterplan_DeWerkplaats_Tilburg_19april_2011_geheel_lage_kwaliteit.pdf.aspx.

Gemeente Tilburg. (2011b). *Klimaatmonitor 2010*. Tilburg: Retrieved from http://bis.tilburg.nl/upload/notas/2011/110823-20-BO-02%20Klimaatmonitor%202010%20rapportage%20definitief%2031%20mei_cntb.pdf.

Gemeente Tilburg. (2011c). *Maatschappelijk Verantwoord Ondernemen*. Tilburg: Gemeente Tilburg Retrieved from http://www.tilburg.nl/bpmapp-upload/download/fstore/9107105412011d1c_86c347_131178a40b4_2ae5/mvo-brochure-juli-2011.pdf.

Gemeente Tilburg. (2011d). *Praktijkaanpak MOED (Midden-Brabantse Ontwikkelingsmaatschappij voor Energie & Duurzaamheid)*. (Nota 110322-24-BO). Tilburg: Retrieved from <http://bis.tilburg.nl/college/a/2011/13/86378/?zk=moed#86378>.

Gemeente Tilburg. (2011e). *Raadsvoorstel Innovatieontwikkeling Klimaatneutrale Steden: Klimaatshap regio Tilburg*. (Nota 110329-08-BO). Tilburg: Retrieved from http://bis.tilburg.nl/upload/notas/2011/110329-08-BO-02%20Raadsvoorstel%20Innovatie%20Klimaatneutrale%20Steden_crdv.pdf#search=inovatieontwikkeling.

Geurs, K. T., & van Wee, B. (2006). Ex-post Evaluation of Thirty Years of Compact Urban Development in the Netherlands. *Urban Studies*, 43(1), 139-160.

Gilderbloom, J. I., Hanka, M. J., & Lasley, C. B. (2009). Amsterdam: planning and policy for the ideal city? *Local Environment*, 14(6), 473-493.

GPR. (2011). *GPR English Info*. Retrieved from <http://www.gprgebouw.nl/website/documenten/bestanden/downloads/English%20info%20GPR.pdf>.

GPRGebouw.nl. (2011). GPR Gebouw. Retrieved August 17, 2011, 2011, from <http://www.gprgebouw.nl/website/gebouw.aspx>

GreenBusinessClub.nl. (2011a). Corporate Car Sharing. Retrieved September 25, 2011, 2011, from <http://www.greenbusinessclub.nl/public/project/detail/50>

GreenBusinessClub.nl. (2011b). Green Business Club. Retrieved November 1, 2011, 2011, from <http://www.greenbusinessclub.nl/>

GreenBusinessClub.nl. (2011c). Vesteda gooit hoge ogen met duurzaamheids- en milieuscores. Retrieved November 1, 2011, 2011, from <http://www.greenbusinessclub.nl/public/news/newsdetail/14/vesteda-gooit-hoge-ogen-met-duurzaamheids-en-milieuscores>

Grimm, N. B., Faeth, S. H., Golubiewski, N. E., Redman, C. L., Wu, J., Bai, X., & Briggs, J. M. (2008). Global Change and the Ecology of Cities. *Science*, 319(756), 756-760.

Groendak.info. (2009). Amsterdam: ook subsidie voor groene daken. Retrieved October 26, 2011, 2011, from <http://www.groendak.info/amsterdam-ook-subsidie-voor-groene-daken>

Gupta, J., Lasage, R., & Stam, T. (2007). National efforts to enhance local climate policy in the Netherlands. *Environmental Sciences*, 4(3), 171-182.

Hajer, M., & Zonneveld, W. (2000). Spatial Planning in the Network Society—Rethinking the Principles of Planning in the Netherlands. *European Planning Studies*, 8(3), 337-355.

Hazebroek, M., & Schneider, H. (2010). A multi-sector network approach for an integrated Local Climate Policy - Think Global, Connect Local (Tilburg, The Netherlands). In M. van Staden & F. Musco (Eds.), *Local governments and climate change: sustainable energy planning and implementation in small and medium sized communities* (pp. 229-242). Dordrecht, the Netherlands: Springer Science + Business Media B.V.

Holman, N. (2009). Incorporating local sustainability indicators into structures of local governance: a review of the literature. *Local Environment*, 14(4), 365-375.

Hooghe, L., & Marks, G. (2003). Unraveling the Central State, but How? Types of Multi-Level Governance. *The American Political Science Review*, 97(2), 233-243.

Hoppe, T., & Coenen, F. (2011). Creating an analytical framework for local sustainability performance: a Dutch case study. *Local Environment*, 16(3), 229-250.

Jabereen, Y. R. (2006). Sustainable Urban Forms: Their Typologies, Models, and Concepts. *Journal of Planning Education and Research*, 26, 38-52.

Jacobs, J. (1961). *The Death and Life of Great American Cities*. New York: Random House.

Janssen-Jansen, L. B. (2011). From Amsterdam to Amsterdam Metropolitan Area: A Paradigm Shift. *International Planning Studies*, 16(3), 257-272.

Jonas, A. E. G., While, A., & Gibbs, D. C. (2004). State modernisation and local strategic selectivity after Local Agenda 21: evidence from three northern English localities. *Policy & Politics*, 32(2), 151-168.

Jonkhoff, E. (2011, June 23, 2011). [Personal Communication].

Jordan, A. (2008). The governance of sustainable development: taking stock and looking forwards. *Environment and Planning C: Government and Policy*, 26, 17-33.

Kern, K., & Bulkeley, H. (2009). Cities, Europeanization and Multi-level Governance: Governing Climate Change through Transnational Municipal Networks. *Journal of Common Market Studies*, 47(2), 309-332.

Klimaatbureautilburg.nl. (2010). Tilburgse nieuwbouw steeds duurzamer. Retrieved August 23, 2011, from http://www.klimaatbureautilburg.nl/Nieuws/Juni_2010/Tilburgse_nieuwbouw_steeds_duurzamer

Klimaatbureautilburg.nl. (2011). Subsidie energie idee. Retrieved September 14, 2011, 2011, from http://www.klimaatbureautilburg.nl/Tilburg_en_het_klimaat/Subsidie_energie_idee

Kuijsters, L. (2011, September 9, 2011). [Personal Communication].

- Lever, W. F. (1999). Competitive Cities in Europe. *Urban Studies*, 36(5-6), 1029-1044.
- Majoor, S. (2008). Chapter 3: Amsterdam Zuidas *Disconnected Innovations* (pp. 67-118). Delft: Uitgeverij Eburon.
- McDonough, W., & Braungart, M. (2002). *Cradle to cradle*. New York: North Point Press.
- Midpointbrabant.nl. (2011). Midpoint Brabant. Retrieved August 25, 2011, 2011, from <http://www.midpointbrabant.nl>
- MilieuFocus. (2008, November 18, 2008). Nationaal Milieubeleidsplan 4 (NMP4). Retrieved August 8, 2011, 2011, from <http://www.milieufocus.nl/factsheets/n/nationaal-milieubeleidsplan-4-nmp4.html>
- Mommaas, H., Smeets, R., Hermans, F., & Dagevos, J. (2011). *Duurzaamheidsbalans van Brabant 2010*. Tilburg: Telos Retrieved from http://www.telos.nl/Publicaties/PublicatiesBoeken/downloads_getfilem.aspx?id=145128.
- NDSM.nl. (2011). NDSM-Wherf. Retrieved August 11, 2011, 2011, from <http://www.ndsm.nl/index.php?pg=1&scrl=3>
- Needham, B. (2007). *Dutch land use planning: Planning and managing land use in the Netherlands, the principles and the practice*. Den Haag: Sdu Uitgevers bv.
- Nieuwamsterdamsklimaat.nl. (2007). *Programmabureau Klimaat op komst*. Amsterdam: Gemeente Amstedam Retrieved from <http://www.nieuwamsterdamsklimaat.nl/@187631/pagina/>.
- Noordwaarts.nl. (2011a). Investerings en Welstandsnota. Retrieved August 30, 2011, 2011, from http://www.noordwaarts.nl/projecten/buiksloterham/planontwikkeling_en/investerings_en/
- Noordwaarts.nl. (2011b). Projectbesluit. Retrieved August 30, 2011, from http://www.noordwaarts.nl/projecten/buiksloterham/planontwikkeling_en/projectbesluit/
- Noordwaarts.nl. (2011c). Winnaars duurzaamheidtender BSH. Retrieved August 12, 2011, 2011, from <http://www.noordwaarts.nl/projecten/buiksloterham/duurzaamheidtender/winnaars/>
- Pijnenburg, B. (2011). Personal Communication.
- Provan, K. G., & Kenis, P. (2007). Modes of Network Governance: Structure, Management and Effectiveness. *Journal of Public Administration Research and Theory*, 18, 229-252.
- Relevant.nl. (2011). Verantwoording Groepsrisico. Retrieved September 4, 2011, 2011, from <https://www.relevant.nl/display/THEMA/Verantwoording+Groepsrisico>
- Rijksoverheid.nl. (2011). Vraag en antwoord: Wat is de energieprestatiecoëfficiënt (EPC)? Retrieved September 22, 2011, 2011, from <http://www.rijksoverheid.nl/onderwerpen/energiebesparing/vraag-en-antwoord/wat-is-de-energieprestatiecoefficient-epc.html>
- Rotterdam wil eigen uitstoot CO2 halveren; Onderdeel van klimaatplan. (2007, May 10). *NRC Handelsblad*.

- Rydin, Y., Holman, N., & Wolff, E. (2003). Local Sustainability Indicators. *Local Environment*, 8(6), 581-589.
- Schellekens, R. (2011, June 6). [Personal Communication].
- Seawright, J., & Gerring, J. (2008). Case Study Techniques in Case Study Research: A Menu of Qualitative and Quantitative Options. *Political Research Quarterly*, 61(2), 298-308.
- Sippel, M., & Jensen, T. (2009). What about local climate governance? A review of promise and problems. *Munich Personal RePEc Archive (MPRA) Paper No. 20987*. Retrieved from <http://mpa.ub.uni-muenchen.de/20987/>
- Sneddon, C. S., Howarth, R. B., & Norgaard, R. B. (2006). Sustainable development in a post-Brundtland world. *Ecological Economics*, 57, 253-268.
- Spetter, M. (2011, July 5, 2011). [Personal Communication].
- Spier, M. (2010). *Programmabureau Klimaat en Energie naar DRO*. Amsterdam: Gemeente Amsterdam Retrieved from <http://www.amsterdam.nl/wonen-leefomgeving/item-421945/actueel-0/nieuws/@342132/programmabureau/>.
- Stam, T. (2011, June 17, 2011). [Personal Communication].
- Stoker, G. (1998). Governance as theory: five propositions. *International Social Science Journal*, 155, 17-27.
- Thenewmotion.com. (2011). Elektrische auto's delen aan de Amsterdamse Zuidas. Retrieved November 1, 2011, 2011, from <http://www.thenewmotion.com/incentives/elektrische-autos-delen-aan-de-amsterdamse-zuidas/>
- Tilburg.nl. (2011a). Maatschappelijk verantwoord ondernemen. Retrieved September 13, 2011, 2011, from http://www.tilburg.nl/stad/ep/channelView.do?channelId=-14465&displayPage=%2Fep%2Fchannel%2Ftl_channel_default_program.jsp&pageTypeId=8544
- Tilburg.nl. (2011b). Subsidiewijzer gemeente Tilburg. Retrieved September 14, 2011, 2011, from http://product.sduconnect.nl/product.xml?productmod_keywords=Tilburg&productxml_action=product_search_subsidiewijzer&view=product_search&lokettype=8&loket_id=43&sort_by=&account_id=222&collection_id=729&productmod_search_on=all
- Tilburg.nl. (2011c). Tilburg 2040: expeditie Tilburg. Retrieved August 22, 2011, from http://www.tilburg.nl/stad/ep/channelView.do?channelId=-14820&displayPage=%2Fep%2Fchannel%2Ftl_channel_default_program.jsp&pageTypeId=8540
- Tilburg.nl. (2011d). Wonen in Tilburg: Afvalscheiding. Retrieved September 8, 2011, 2011, from http://www.tilburg.nl/stad/ep/channelView.do?channelId=-10816&displayPage=%2Fep%2Fchannel%2Ftl_channel_default_program.jsp&pageTypeId=8540
- Triplepundit.com. (2011). About. Retrieved December 1, 2011, from <http://www.triplepundit.com/about/>

- United Nations. (2010). *World Urbanization Prospects: The 2009 Revision*. New York: United Nations Retrieved from http://esa.un.org/unpd/wup/Documents/WUP2009_Highlights_Final.pdf.
- United Nations World Commission on Environment and Development (WCED). (1987). *Our Common Future*. Oxford: Oxford University Press.
- van Bueren, E., & ten Heuvelhof, E. (2005). Improving governance arrangements in support of sustainable cities. *Environment and Planning B: Planning and Design*, 32, 47-66.
- van Buuren, P. J. J., de Gier, A. A. J., Nijmeijer, A. G. A., & Robbie, J. (2009). *Hoofdlijnen ruimtelijk bestuurrecht*. Deventer: Kluwer.
- van den Brink, A., van der Valk, A., & van Dijk, T. (2006). Planning and the Challenges of the Metropolitan Landscape: Innovation in the Netherlands. *International Planning Studies*, 11(3-4), 147-165.
- van der Made, H. (2011, June 23, 2011). [Personal Communication].
- van der Valk, A. (2002). The Dutch Planning Experience. *Landscape and Urban Planning*, 58, 201-210.
- van Doorn, A. (2011, July 12, 2011). [Personal Communication].
- van Eijk, B. (2011, May 30, 2011). [Personal Communication].
- van Vliet, R. (2011, May 31). [Personal Communication].
- Vervoersplanoloog.blogspot.com. (2011). Image: Ligging Zuidas. Retrieved September 20, 2011, 2011, from http://2.bp.blogspot.com/-WaKfgWtMG04/TcAF4Kszg6I/AAAAAAAAAGq/L3_EYUJI1AQ/s1600/Ligging%2BZuidas.jpg
- Virtual Museum Zuidas. (2011). *Concept for Art And Culture in Amsterdam ZuidAs 2011-2014*. Amsterdam: Virtual Museum Zuidas Retrieved from <http://www.virtueel-museum.nl/pdf/Concept%20VMZ%202011-2014%20English.pdf>.
- Vos, M. (2010). *Amsterdam Uitgesproken Duurzaam: Perspectief voor 2040*. Amsterdam: Gemeente Amsterdam Retrieved from http://www.amsterdam.nl/gemeente/organisatie-diensten/sites/dienst_milieu_en/duurzame_toekomst.
- Wheeler, S. (2000). Planning for Metropolitan Sustainability. *Journal of Planning Education and Research*, 20, 133-145.
- Wheeler, S. (2008). State and Municipal Climate Change Plans: The First Generation. *Journal of the American Planning Association*, 74(4), 481-496.
- Wheeler, S., & Beatley, T. (Eds.). (2009). *The Sustainable Urban Development Reader*. New York: Routledge.
- Wild, A., & Marshall, R. (1999). Participatory practice in the context of Local Agenda 21: a case study evaluation of experience in three English local authorities. *Sustainable Development*, 7, 151-162.

Williams, K. (2000). Does intensifying cities make them more sustainable? In k. Williams, E. Burton & M. Jenks (Eds.), *Achieving Sustainable Urban Form* (pp. 30-45). New York: Routledge.

Wolsink, M. (2003). Reshaping the Dutch planning system: a learning process? *Environment and Planning A*, 35, 705-723.

Woltjer, J. (2009). Concepts of Participatory Decision-Making in Dutch Infrastructure Planning. In F. H. J. M. Cohen (Ed.), *Public Participation and Better Environmental Decisions - The Promise and Limits of Participatory Processes for the Quality of Environmentally Related Decision-making* (pp. 153-163): Springer Science + Business Media B.V.

Zoeteman, B., Smeets, R., & Hermans, F. (2011). *De Duurzaamheidsbalans van Tilburg 2010*. Tilburg: Telos Retrieved from http://www.telos.nl/Publicaties/PublicatiesRapporten/downloads_getfilem.aspx?id=166814.

Zuidas.nl. (2011). Zuidas Amsterdam. Retrieved September 20, 2011, 2011, from <http://www.zuidas.nl/>

Zuidassolar.nl. (2011). Zuidas Solar. Retrieved November 2, 2011, 2011, from <http://zuidassolar.nl/>

Appendix: Summary of Governing Modes for each case study

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Energy	Zuidas 	Municipal building for Zuideramstel equipped with thermal heating/cooling storage system and emits 60% less CO ₂ emissions than a traditional building Municipality purchases green energy from the Waste Energy Company for its own use	Developing a strategy for thermal heating and cooling (WKO) Promoting the use of BREEAM certification with a goal of achieving a rating of 'Excellent'	Partnering with the energy company to provide access to district heating and cooling	Enforcing energy performance regulations for new or renovated buildings
	Buiksloterham 		Use of sustainability tender to stimulate market parties to come with energy-efficient development plans	Providing access to municipal district heating system with residual heating from industrial areas elsewhere in the city	Requiring connection to District Heating system for new buildings or major renovations
	Spoorzone 	Municipality purchases 100% green energy for its own use	Establishing an alliance in the Klimaatschap for the energy service company Establishing norms for GPR Gebouw and EPC scores that improve upon the national requirements	Partnering with the energy company to provide access to thermal heating and cooling Creation of ESCO to develop and promote sustainable energy solutions	Enforcing energy performance regulations for new or renovated buildings Mandatory energy labeling at point of build, purchase, or sale
Spatial & land-use planning	Zuidas 		ZIPs process is designed to be more flexible for market parties, helps create dialog with developers regarding sustainability objectives		Development of a detailed urban plan and high involvement of municipality in planning for development made possible by strong ground position
	Buiksloterham 	Fixing the sale price of municipally owned land in order to enable the sustainability tender process	Sustainability tender process to facilitate innovation by market parties		Zoning changes to allow mixed-use in formal industrial area

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
	Spoorzone 		Establishing an alliance in the Klimaatschap for climate and spatial planning		Developing new land-use plans to guide redevelopment towards municipal vision Leveraging it's ground position to have a leading role in the design and development of 'De Werkplaats'
Mobility & transportation	Zuidas 	Municipal use of electric vehicles	Promotion of electric vehicles & alternative forms of transportation Participating in the Green Business Club to promote car sharing between companies in Mahler4	Provision and expansion of diverse and well connected forms of public transportation Bicycle and pedestrian walkways ensure space and safety for non-motorized traffic Provision of charging stations for electric vehicles	Transportation plan is developed and implemented by the municipality
	Buiksloterham 	Greening of municipal vehicle fleet	Promotion of bicycle use Electric car campaign	Expansion of public transportation network with increased bus stops, adding a metro station with the North/South line, reserving space for a ferry landing, adding pedestrian/cycling bridges Provision of charging stations for electric cars	Zoning changes' affect limiting freight traffic to specific streets to avoid air and noise pollution on smaller streets and in mixed-use areas with residencies Requiring parking space allocation to be dealt with on development plots
	Spoorzone 	Conversion of municipal vehicle fleet to run on natural gas	Promoting car-sharing and electronic vehicle initiatives	Bicycle and pedestrian walkways ensure space and safety for non-motorized traffic, making alternatives to vehicle-based travel possible	Transportation plan is developed and implemented by the municipality

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Biodiversity & habitat	Zuidas 	Municipal Zuideramstel office built with green roof	Promoting of green roofs and walls & encouragement of 'BREEAM Nieuwbouw' Piloting more comprehensive certification schemes such as 'BREEAM Gebied'	Provision of trees along roadways & development of public green space Subsidies for green roofs & walls	Strict regulations regarding removal of trees and green space
	Buiksloterham 		Sustainability tender process to facilitate innovation by market parties – e.g. green roofs or landscaping	Provision of parks and development/maintenance of waterfront property (once acquired)	Use of building permit process as leverage for renegotiating rights to waterfront
	Spoorzone 		Stimulation of green roofs and courtyards Promotion of GPR tool to encourage biodiversity	Provision of green space in 'De Werkplaats' and other areas owned by the municipality	Use of building permit process to address ground pollution cleanup
Waste	Zuidas 	Investing in waste collection vehicles that achieve higher environmental performance Training of waste collection staff to be more efficient drivers	Promotion campaigns to make use of waste separation facilities Partnering with the DGBC for the promotion of waste-saving build processes promoted by BREEAM certification	Provision of waste collection facilities and programs for separation of waste Creation of the waste energy company (AEB) to make use of otherwise non-reusable waste	Regulating for the proper disposal of hazardous waste
	Buiksloterham 	Investing in waste collection vehicles that achieve higher environmental performance Training of waste collection staff to be more efficient drivers	Sustainability tender process promoting innovative use of materials Promotion of waste separation	Provision of waste collection facilities and programs for separation of waste Municipal waste energy company (AEB)	Regulating for the proper disposal of hazardous waste

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
	Spoorzone 		Promotion of waste separation GPR Gebouw stimulates LCA studies and reuse of waste where possible in the building process	Conveniently located disposal stations for glass, plastic, and paper waste	
Building retrofits	Zuidas 		Encouraging the use of BREEAM certifications for existing buildings and areas		Covenant agreements with social housing corporations and the rented housing market Enforcement of building standards and codes when major renovations require new building permits
	Buiksloterham 				Zoning plan changes to allow repurposing of existing buildings for other functions Enforcement of building standards and codes when major renovations require new building permits Covenants with the housing sector to obtain energy labels and improve energy efficiency in existing buildings

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
	Spoorzone 		Promoting GPR Gebouw use to be completed when applying for building permits		Requirement to obtain energy label for buildings upon building, selling, or renting as of 2008 Covenant agreement with social housing sector to move in the direction of energy-efficient social housing Enforcement of building standards and codes when major renovations require new building permits
Food & agriculture	Zuidas 	Planting of a corn field in an otherwise idle and undeveloped plot 40% of products purchased for catering in the municipality are biologically produced	Educating and raising awareness about the food system and the benefits of creating synergies between the city, landscape, recreation, food production, and health	Provision of space for locally and sustainably produced food markets	Allowing temporary agricultural uses in space otherwise zoned for mixed use, commercial, or residential development.
	Buiksloterham 	40% of catering food products are biologically produced	Promotion of sustainable food and agriculture through Proeftuin Amsterdam (expired in 2010)		
	Spoorzone 	Municipal purchasing of biological milk for its cafeterias	Investigating the temporary use of idle land for food and agriculture		Working to remove barriers for innovative initiatives, such as adjusting land-use plans to allow for the creation of 'De Groene Kamer'

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Water	Zuidas 		Promoting water efficient design through encouragement of BREEAM/LEED building certifications as well as promotion and subsidies for green roofs	Provision of water management system, including canal and sewage systems in collaboration with water utility (Waternet)	Strict water policy ensuring effective water management and water safety Analyzing the effects to the water system in the building permit process
	Buiksloterham 		Promotion of water efficiency through sustainability tender process	Provision of drinking water and sewage systems in collaboration with water utility (Waternet)	Make and enforce regulations for water quality, management of runoff, flood safety
	Spoorzone 		Promotion of water efficiency through use of GPR Gebouw tool	Provision of drinking water Provision of stormwater drainage and sewage systems	Regulations for water quality
Production & consumption	Zuidas 	Municipal choice for bricks over concrete streets based on total cost and reusability of the material Sustainable purchasing program	Municipal involvement in the Green Business Club to create a forum for businesses to pursue sustainability initiatives	Creation of 'EnergieLoket' to help businesses improve their energy efficiency	
	Buiksloterham 	Municipal sustainable purchasing program	Promotion of sustainable businesses through events and participation in organizations such as Amsterdam Innovation Motor (AIM)		
	Spoorzone 	Sustainable purchasing program for municipal organizations	Promotion of Fair Trade products and their consumption	Making subsidies available for socially responsible companies	

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
Cultural & historical	Zuidas 		Promotion of cultural & historical events	Establishing a municipal program for developing art and culture and establishing a supervisor to be responsible Allowing space for events and exhibits to take place in public	Protection of monument sites
	Buiksloterham 		Consideration for preservation of cultural and historical heritage in evaluation criteria for sustainability tender (GPR Gebouw)		Protection of buildings with cultural-historical importance
	Spoorzone 		Establishing a vision for cultural-historical preservation and encouraging design that corresponds with the character of the area Promoting the use of GPR Gebouw to evaluate building design	Partnering with local educational institutions to create space for cultural facilities	Protection of monument sites, ensuring their preservation and renovation
Health & wellness	Zuidas 	Making use of environmentally superior vehicles in municipal fleet to reduce air pollution	Promoting sustainable and cleaner forms of transportation to promote active lifestyles and reduce air pollution Promote temporary use of otherwise unused property to avoid dead spaces	Making use of noise dampening structures and sound barriers for roadways (or move infrastructure underground – ‘Dok model’) Municipal lighting of streets, waterfront, and public space Creation and design of public space	Enforcing noise and air pollution standards Zoning for mixed-use creates opportunities for diversity and vitality in the area
	Buiksloterham 		Promotion of health and wellness through the sustainability tender process	Municipal lighting of streets, waterfront, and public space	Regulations for noise and air pollution levels Zoning for mixed-use creates opportunities for diversity and vitality in the area

<u>Policy areas</u>	<u>Project</u>	<u>Self-governing</u>	<u>Governing through enabling</u>	<u>Governing by provision</u>	<u>Governing by authority</u>
	Spoorzone 		Promoting the use of GPR Gebouw to evaluate building design	Municipal lighting of streets, waterfront, and public space Allocation of public space in the Spoorzone	Regulations for noise and air pollution levels in accordance with the zoning plan