2011

Collaboration and Climate Action at the Local Scale

Linda Lyshall

Antioch University - PhD Program in Leadership and Change

COLLABORATION AND CLIMATE ACTION AT THE LOCAL SCALE

LINDA JEAN LYSHALL

A DISSERTATION

Submitted to the Ph.D. in Leadership & Change Program
of Antioch University
in partial fulfillment
of the requirements for the degree of
Doctor of Philosophy

March, 2011

This is to certify that the dissertation entitled:

COLLABORATION AND CLIMATE ACTION AT THE LOCAL SCALE

prepared by

Linda Jean Lyshall

is approved in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Leadership & Change.

Approved by:

_____

Alan Guskin, Ph.D., Chair date

_____

Philomena Essed, Ph.D., Committee Member date

_____

David Fluharty, Ph.D., Committee Member date

_____

Michele Betsill, Ph.D., External Reader date

Acknowledgements

I would like to acknowledge the faculty of Antioch's PhD in Leadership and Change Program for providing excellent guidance throughout this learning experience. I particularly want to thank Alan Guskin for serving as the chair of my dissertation committee, for his thoughtfulness and generosity of time, and for being a good friend. I would also like to thank my dissertation committee members, Philomena Essed and David Fluharty, for providing superb feedback and critique on my research and dissertation. My appreciation also goes to Michele Betsill for serving as my external reader and providing exceptional feedback and suggestions for improvement. I want to express my great appreciation for the staff members from King County and the participating cities who were involved with and supported this project. Lastly, I want to thank my parents and the rest of my family, my friends, and my colleagues from Cohort 7 who supported me throughout this process with friendship, camaraderie, and love.

Dedication

This dissertation is dedicated to my daughters who are shining stars in my world, and to the hope that their generation, and the ones that follow, will find ways to share this earth peacefully and equitably with all its inhabitants.

Abstract

This dissertation encompasses a case study and a Participatory Action Research project. The case study focuses on climate change mitigation activities within King County, Washington and its 39 cities and towns and discusses progress and challenges related to transportation issues, efficiency measures, and sustainability planning. The findings indicate there is a high level of activity in waste reduction, environmental outreach and education, bicycle and pedestrian promotion, tree canopy protection, sustainability policies, and green building. Other categories, such as energy efficiency, electric vehicle infrastructure, and greenhouse gas emission inventories and goal setting are on the rise. Twelve of the cities were found to be highly active with several more initiating new sustainability related policies and programs. The two overall biggest challenges to implementing climate change mitigation efforts in this area are the lack of financial and technical resources and the lower prioritization of these activities. The Participatory Action Research project was developed and conducted in collaboration with King County and nine of its cities in support of regional climate change and sustainability solutions, with the intent to increase climate change mitigation within King County. As a result of the project, the King County Cities Climate Collaboration was created to formalize a working partnership between the cities and the County, encourage and support region-wide emission reduction strategies, and increase efficiency and effectiveness of efforts through bottom-up collaboration and systemic operational integration. The electronic version of this Dissertation is at OhioLink ETD Center, www.ohiolink.edu/etd.

TABLE OF CONTENTS

List of Tables

List of Figures

Chapter I: Introduction, Purpose, and Justification

The planet Earth is currently experiencing a change in climate that scientists concur is primarily caused by human activity, particularly the release of carbon dioxide, methane, and nitrous oxide, commonly known as greenhouse gases (GHGs) (IPCC, 2007). These gases trap infrared radiation in the atmosphere which warms the earth. There are many sources of these gases, with the most significant being fossil fuels, landfills, agriculture, ruminant livestock and rice cultivation (Reay, 2008). In the US, fossil fuel based energy use and transportation are the leading culprits.

The implications of climate change are significant and urgent. Increases in atmospheric and oceanic temperatures, melting of glaciers, disappearance of snowpack, rising sea level, acidification of the oceans, and shifting of plant and animal ranges are changing the world as we know it (IPCC, 2007). The International Panel on Climate Change is projecting a widespread increase in thawing of permafrost, frequency of heat waves, and intensity of tropical storms, as well as a shrinking of sea ice, and both increases and decreases in precipitation depending on geographic location (IPCC, 2007).

These changes are increasing the severity of drought, flooding, coastal erosion, species decline, saltwater intrusion, forest fires, and vector-borne disease. Hundreds of millions of people are at increasing risk of food and water shortages, loss of homes and community, and contracting illness (Müller, 2002). “Urban vulnerabilities to climate change are particularly acute in the global South, where processes of global environmental change may not only lead to extreme events but also exacerbate chronic problems of poverty and environmental stress” (Bulkeley, 2010, p. 230). Climate change also poses an intergenerational challenge. What kind of

earth do we leave our children, and their children? Comprehensively addressing climate change will change us as a people and as a culture (Hawken, 2010).

Efforts to address climate change are currently focused on adaptation to changes in the environment and mitigation through carbon sequestration and GHG emission reduction. Adaptation is being addressed through the reduction of climate hazards and decreasing the vulnerability of societies in question, such as relocating cities and villages away from the shoreline and out of floodplains, securing reliable clean water and food sources, and protecting against diseases (United Nations, 2009). Mitigation encompasses shifting to renewable clean energy sources, changing urban growth patterns and transportation options, increasing green building, planting trees, reducing waste, and minimizing agricultural and industrial emissions.

This research focuses on how local government entities are approaching implementation of climate mitigation actions. Successes being achieved around the world are highlighted, as well as some of the prevalent challenges. It also addresses how local jurisdictions can work together to achieve economies of scale and to increase the power of their voice and success of their actions.

The Need for Climate Change Mitigation

In 2007, the Intergovernmental Panel on Climate Change (IPCC) concluded that climate change is a large risk to human and natural systems (IPCC, 2007). They also concluded that at the current trajectory global GHG emissions could double by the year 2050 and reducing emissions at least 50 percent below current levels is necessary to effectively mitigate the risks of climate change. Much of this mitigation will need to be encouraged or mandated by government policy and regulations. Some policies that clearly save money and improve human health will be relatively easy to implement, while others that create an inconvenience or extra cost for powerful industries might not be politically feasible.

It is generally accepted in the climate change planning community that the earlier and more significantly climate change is addressed the better (IPCC, 2007). The more action that is accomplished now, the better the scenario for ecosystem health and societal sustainability over the medium and long-term. Human well-being is inextricably linked to every climate policy and decision (IISD, 2010).

International and National Efforts

National governments, the Intergovernmental Panel on Climate Change (IPCC), non-governmental organizations, the United Nations Framework Convention on Climate Change, and numerous other actors have worked for several years to implement international policy to mitigate climate change. The Kyoto Protocol, signed in 1997, was the first significant international agreement to mitigate climate change. Numerous national governments agreed to its goals and objectives and attempted to meet its targets. The United States, the second largest emitter of greenhouse gases, did not participate in this agreement. With the election of a liberal democratic United States president, national and international hopes were high that the 2009 Copenhagen Climate Conference would fare better results than Kyoto, and that the outcomes of the conference would provide a new and stronger climate protocol before the Kyoto protocol expires in 2012. Some success was achieved in that "the Copenhagen Accord signaled that a concerted global effort to address climate change is possible" but it remains "weaker than science demands" (Gerdes, 2009, para. 13).

International agreements and national action are essential for achieving the emission reduction targets identified by the IPCC (2009). "Nearly all the growth in emissions in the coming decades will come from developing countries, and…without developing countries actively engaged, the fight is lost" (Gerdes, 2009, para. 14). Copenhagen did not get us where we need to be, but hope still endures with the participation of the United States and major developing countries such as China, India, Brazil, and South Africa. National governments, however, are often more influenced by powerful constituents and industry lobbyists that are focused on the bottom line than by advocates of societal well-being. Consequently,

policy change within some countries, such as the United States, is far more difficult at a national scale with powerful corporate influence than at a local scale with public involvement. Systemically, the local scale is where change needs to happen, and where it can happen.

Local Scale Influence

Actions to address climate change are blossoming throughout the globe at the local scale. Several local jurisdictions are taking a leadership role and moving forward with adaptation and mitigation activities despite, in some cases, the lack of state and national policies or mandates. Non-nation state actors (NNSAs) are increasing in visibility and influence in global climate politics (Okereke et al., 2009). At the same time, many participants in the 2009 Copenhagen Climate Change Summit considered it largely a failure because hoped for international agreements to achieve effective collaborative governance were not achieved (Dimitrov, 2010). Nevertheless, it was acknowledged that there is a "vibrant multilevel policy realm… comprising regional, national, subnational and local policies as well as nonstate initiatives worldwide [that] is steadily gaining speed" and is making significant aggregate progress (Dimitrov, 2010, pp. 18, 22).

Climate governance has definitely been broadened "beyond the realms of the international climate regime" (Okereke et al., 2009, p. 59). We are seeing a changing global order where local and state governments are developing their own climate action regulations and plans despite a lack of national or international commitment and action. Researchers estimate that in some countries, such as the Netherlands, local governments have the ability to directly influence up to forty percent of GHG emissions (Krajnc, 2003). Other reports "suggest that cities may be responsible for up to 75 percent of global emissions of carbon dioxide from anthropogenic sources" (Bulkeley, 2010, p. 230).

How cities and counties grow and develop their infrastructure, economies, and communities is part of the problem, but it can also be part of the solution. Local governments are logical entities to embrace and confront the challenges of climate change mitigation for multiple reasons. First, cities are where the emissions are primarily generated. They are home to half of the world's population and they generate the bulk of the economic output and the largest sources of GHG emissions from humans (ICLEI, 2009). Second, cities and counties have jurisdiction and authority over infrastructure, transportation, land use planning, building codes, and multiple other systems that need to be managed and integrated to comprehensively address climate change. They "are well positioned to develop policy and programmatic solutions that best meet specific geographic, climatic, economic, and cultural conditions" (Corfee-Morlot et al., 2009, p. 31). Cities "have the ability to design solutions that are adapted to the needs of local constituents and that are consistent with local policy priorities" (Corfee-Morlot et al., 2009, p. 85).

Climate change action has presented unique governance arrangements that involve entities from local communities to transnational organizations. This new phenomenon questions the authority and nature of how the state achieves outcomes, and is possibly moving away from a hegemonic social order. It could also be described as "an expression of a change in governmentality where civil society is rendered both an object and the subject of governing" (, Bulkeley, and Schroeder, 2009, p. 68). These new approaches can "generate an understanding of power that is radically different from those implied in the prevailing accounts of regime analysis and global governance. Rather than seeing power in distributive, zero-sum terms, they demonstrate that power is multiple and relational" (Okereke et al., 2009, p. 72).

Corfee-Morlot, et al. (2009) have concluded that "climate change is a problem that can only be adequately addressed if action is taken at all levels of government: international, national,

regional, and local" (p. 85). That said it is important to note that climate change action at the local level has achieved great success and has surpassed efforts at the national scale in the United States (Krajnc, 2003; M. Pageler, personal communication, June, 2010). Counties, cities, and towns are achieving both environmental and economic progress through numerous voluntary and regulatory actions. Local governments and international organizations have initiated several networks to grow and sustain these efforts, creating a new type of multi-level governance and shifting the political state of affairs of climate change action. Despite the lack of national leadership, and against the economic free-rider theory, local and state governments are taking responsibility and effective action (Okereke et al., 2009).

Even with this progress, governmental entities have a long way to go in figuring out how to reach the emission reduction goals necessary to stop climate change in the long-term. Climate policy is often fragmented and inconsistent with other policies, and many of the tools needed to develop cohesive responses are lacking. Barriers include financial, technical, capacity, informational, and institutional governance obstacles. Many government staff and decision makers at the local level are developing and implementing successful programs and projects that address mitigation efforts, however resource constraints and complex systems make it challenging to achieve the level of reductions needed. "Politics and science are no longer barriers to cities taking action on climate change, rather resources and capacity are" (ICLEI, 2006, p. 3).

For significant emission reductions to occur at the local level, city and county governments need to figure out how they can work together to overcome the resource and capacity issues, particularly in the current economic climate. Several networks have arisen internationally, nationally, and regionally that have provided resources and contributed to increasing capacity (Okereke et al., 2009). There is still a great need, however, to further address localized resource

and capacity issues. Research focused on comprehensively understanding these needs and overcoming these obstacles in climate change mitigation at the local scale is rare.

Purpose of Research

This research has addressed this gap through a Participatory Action Research project in collaboration with a forward thinking county government that is striving to assist its cities and towns in moving forward on climate change mitigation actions. To support progress towards regional solutions, I collaborated with the government of King County, Washington to identify existing local actions, needs, challenges, and interests and facilitated a process to further implementation of climate action. Outcomes of the research include a case study of climate change mitigation activity in King County and its cities and towns, and proposed recommendations to increase adoption and implementation of climate change mitigation policies, projects and programs. The proposed recommendations focus on addressing resource and capacity issues and increasing adoption and implementation of climate change mitigation policies and activities.

Research questions. This study was designed to answer the research questions that follow. These questions, developed in collaboration with King County provided guidance for both phases of the study. The information gathered and analysis of data designed to answer these questions has contributed to King County's efforts through an increased understanding of their jurisdiction's needs, challenges, and interests.

1. What climate change mitigation actions are currently being undertaken?
2. What challenges or obstacles exist in developing and implementing climate change mitigation actions?
3. What are the advantages of multi-jurisdictional collaboration?
4. What are the primary needs of cities and towns implementing climate mitigation actions?

5. In what ways can county governments effectively help address those needs and challenges? What is the most effective role for the county to play?
6. On what actions are cities and towns interested in working? Which actions are appropriate for joint cooperation and collaboration?
7. What are the best ways to implement these actions? How do multiple jurisdictions effectively collaborate to share resources and expertise in climate change mitigation efforts?
8. Is collaboration an effective motivator for change?
9. How can commitment be achieved?
10. Can an intervention of this type be a good way to catalyze interest and action?

Phase 1 – Case Study: Survey of Climate Change Action in King County Cities and Towns

The first component of this project was completion of a case study of current and planned climate change mitigation and adaptation actions, and related sustainability efforts within King County jurisdictions. This included reviewing existing documents and websites and conducting a telephone survey of 33 out of 39 King County cities and towns to gather baseline information. In-person interviews followed with nine of the jurisdictions that were interested in working with King County to increase climate change mitigation efforts.

Phase 2 – Recommendations for Future Collaboration on Climate Change Solutions

The second phase of the research utilized Participatory Action Research methodology focused on development of recommendations for how King County and partner jurisdictions could collaborate to make progress on climate solutions. This involved three workshops between partner jurisdictions, King County, and ICLEI and multiple steering committee meetings. The first workshop provided an opportunity to review the results of the case study, develop options for future collaborative action, and discuss initial recommendations. Information gathered from the case study and initial workshop was used to develop a draft list of potential actions for

regional collaboration on climate change solutions. This list was further developed and refined into proposed recommendations.

Scope and Limitations of Research

There are numerous activities at all levels of government focused on climate change mitigation. This research addressed state, federal, and international efforts only in the context of the day to day operations of city and county government. The first phase of the research involved 33 out of 39 jurisdictions within King County. The second phase of the research involved nine jurisdictions cities that were self-selected by indicating their interest during the survey.

There are several facets to climate change mitigation, most of which have impact at the local level. This study does not address all facets, only those that are primarily led by local governments. While there is some discussion, efforts from states and countries are largely left out, with a few exceptions. In addition, this study is focused on mitigation and not on adaptation.

Geographic Scope of Research

In the State of Washington, King County has emerged as an environmental leader in the local government realm. In 2005 it convened a conference called “The future ain’t what is used to be” that was hugely successful with over 700 attendees from local governments nation-wide. It sparked “great enthusiasm for additional knowledge, collaborative strategies, and shared resources…” (King County, 2007a, p. 10). In response to the flood of requests that King County received following the conference, it developed, in collaboration with the University of Washington Climate Impacts Group and ICLEI – Local Governments for Sustainability, a guidebook titled: Preparing for climate change: a guidebook for local, regional, and state governments. They also developed the 2007 King County Climate Plan and have conducted

annual updates and reports. They are eager to collaborate and work with other jurisdictions to further climate change action.

In King County, the primary source of GHG emissions is fossil fuel used for transportation, followed by natural gas and oil used for heating buildings (King County, 2007b). Other significant sources are the combustion of coal and natural gas to generate electricity and landfill emissions. King County is focused on creating sustainable systems that will mitigate climate change as well as improve operational efficiency, improve public health, improve air and water quality, and contribute to the economy by creating green jobs.

In the 2007 plan, the County outlines areas of operational emissions and a plan of action for reduction. The operational emissions, for which King County is directly responsible, are from transit buses, county and employee vehicles, landfills, wastewater treatment, and county facility electricity usage. The plan also identifies actions the County is committed to taking to influence emission reduction activities in the King County region, Washington State and the United States. In all of these areas, the strategic focus is to address greenhouse gas accountability and limits; climate-friendly transportation choices; clean fuels, clean energy and energy efficiency; and land use, building design and materials (King County, 2007b).

Each year the King County Climate Report is issued which details progress made from the previous year and plans for the coming year for leadership and emission reduction (King County, 2010c). In 2009, King County helped create and lead the New Energy Solutions consortium focused on developing a regional clean energy economy. It also converted 3,000 traffic signals to Light Emitting Diodes, saving electricity and $112,000 per year; increased the percentage of hybrid vehicles in the county's fleet; and led planning for the electric vehicle project. It is in process of initiating a new method of quantifying community greenhouse gas emissions that is a

consumption-based approach rather than strictly a geographically-based approach. It will continue working toward King County's adopted goal of reducing greenhouse gas emissions 80 percent below 2007 levels by 2050, focusing on programs that save money, create new revenue streams, or lead to the creation of new green jobs for the region (King County, 2010c).

Position of Researcher

For the purposes of this dissertation, I am a scholar practitioner. I seek to learn and foster mutual growth, as well as to create change. I came to the environmental field from my love of nature. I see tremendous value in protecting nature, both for its own sake and for human societal benefit. I am a fourth year PhD student and doctoral candidate in Leadership and Change at Antioch University. My studies and career to date have primarily been focused on environmental policy and natural resource management. I completed an undergraduate degree in Environmental Studies: Ecology and Conservation in 2002. During that time, I became deeply concerned by the gravity of environmental crisis our world is experiencing at the hands of human society. I decided I needed more tools and expertise to create change and address these major issues and consequently pursued graduate level education. I completed a Master of Public Administration degree in Natural Resource Management and Environmental Policy in 2004.

For the past 13 years I have worked at the local and state level in the private, non-profit, and governmental sector on environmental issues. I have actively participated in creating change at the local level and I have witnessed the power of collaboration with local, state, and tribal government, citizen groups, and non-profit entities. During my tenure at a state agency focused on ecosystem conservation and recovery, I again felt the need to expand my understanding and knowledge and pursued a PhD degree. Utilizing the knowledge gained through my studies and drawing from my work experience, I undertook this research project to contribute new and useful

information in the fields of organizational change, urban governance, and climate change mitigation at the local scale.

Summary of Subsequent Chapters

Chapter II provides the theoretical framework of collaborative governance theories and a literature review of policy formation, including the co-benefits of climate policies at the local level with an in depth review of land use and transportation policies. These particular policy areas are priorities for King County as the majority of GHG emissions in this area come from these sectors. Renewable, alternative, and conservation energy policies and activities are also addressed as there is a significant amount of interest in this realm in the King County region. Other sectors included in the discussion are green building and waste management. A summary of numerous activities and policy options in a table of policy tools and strategies employed at the local level is provided. This chapter concludes with a set of guiding principles gleaned from the literature for consideration during this research project, as well as the research questions.

Chapter III presents a review of case study and Participatory Action Research methodologies, including examples of completed studies in climate change mitigation at the local level. I examine case studies and research on previous and current efforts in other jurisdictions that provide examples of successful strategies. Based on the guiding principles in Chapter II and research questions presented in Chapter I, this chapter also includes a complete description of the research methodology and procedures utilized for this research project.

Chapter IV is a case study of climate change mitigation and level of activity in King County and includes a compilation of survey data and a discussion of results. This includes information on various categories of climate change mitigation and level of activity of cities and towns.

Chapter V includes the findings from the Participatory Action Research process and a proposal for regional coordination and county support collaboratively developed during the process. It includes an approach and methodology in collaboratively mitigating greenhouse gases at the local scale that can hopefully be replicated in other areas.

In Chapter VI, I provide my interpretation and analysis of the findings, as well as the implications of the study for emission reduction efforts, local governance of climate change mitigation and related practices in other disciplines, particularly for leaders of change. I also discuss ideas for possible future research in this area.

Chapter II: Literature Review and Theoretical Framework

The purpose of this comprehensive review of the literature is to develop a theoretical framework for the case study and participatory action research, and to provide some detailed information about climate change mitigation activities relevant to local governments. In regards to the implementation of climate action at the local level the theoretical framework considers the differences of local versus national and international politics as well as local governments' sphere of influence over mitigation activities. It also addresses the primary research questions seeking to understand how collaboration and collaborative intervention can enhance multi-jurisdictional efforts, motivate participants to create change, and catalyze commitment, interest, and action.

A Theory of Confluence: Climate Action at the Local Level

The United States and other countries are experiencing a transfer of power from national to local levels as the political feasibility of climate change action at a local government scale increases. At the same time, integrated and systemic spatial planning and over-arching sustainability strategies that are central to mitigation activities can best be accomplished at the local level. The combination of these two factors, along with collaborative efforts and the strategic support and encouragement of climate action networks, have resulted in an expansion of climate action at the local government level.

Local versus national and international politics. Climate change is being addressed at multiple levels of government, each with its own sphere of influence and degree of effectiveness. Traditionally, international and national governments have taken the lead in developing policy solutions to global issues while local governments have been relegated to implementing state and

national policy rather than creating their own. In the realm of climate change politics, however, a shift is occurring; city regions are assuming a significant role in climate action and resurging as "new objects and subjects of policy-making" (Varro, 2010, p. 10). A political rescaling is occurring at all levels of climate change governance. "As no other environmental challenge, climate change brings to the fore issues of scale and scalar politics" (Lundqvist & von Borgstede, 2008, p. 300). Brenner (2004) calls this a rescaling of statehood where "city regions have become key institutional sites in which a major rescaling of national state power has been unfolding" (pp. 2-3). This restructuring is causing local, national, and international communities to be re-imagined and is influencing economic, socio-cultural, and political territorial changes.

This shift is fueled by lack of national and international action, a strong citizen-based interest in addressing concerns of climate change, and the advent of social climate change mitigation networks. National and international political action has been strongly thwarted by corporate interests even though surveys illustrate a strong majority of citizen interest in taking climate action (Gillespie, 2001; Opinion Research Corporation, 2006). Subsequently, local, national, and international city networks have developed to support locally based action.

On the national and international scale, the corporate and industry lobbyists have consistently demonstrated the ability to pressure elected officials through "their critical role in funding federal political campaigns" (Byrne, Hughes, Rickerson,& Kurdgelashvili, 2007, p. 4566). In addition,

> The consequences of special interest involvement are exacerbated by the way in which groups claim representation in the political process. More specifically, the US federal system is dominated by a 'winner take all,' majority form of democratic rulemaking (Hill, 2002), rather than the system of proportional representation and coalition governments found in many European nations. In the latter, free parties and other groups supportive of climate change mitigation have gained power in recent years (Tjernshaugen, 2005). By contrast, popular environmental initiatives in the US supported

> by substantial numbers of American citizens may ultimately fail to be represented in national elections and national politics. (Byrne et al., 2007, p. 4558)

Networks and the rise of local political action. "In contrast to mostly inaction at the national level, US states and localities have crafted innovative, cooperative, and increasingly bold strategies to address climate change…with significant implications for the country and for international strategy" (Byrne et al., 2007, p. 4559). These strategies have largely been developed in cooperation and collaboration with other jurisdictions and organizing bodies through social networks. The growing number of local municipalities that have signed on to the Mayors' Climate Protection Initiative and ICLEI's Cities for Climate Protection Campaign illustrates local governments' commitment to addressing climate change and their desire to collaborate on these issues.

> Networks are breeding grounds for exchanging experience and mutual learning. Participating in networks gives local government access to flows of opportunities, and allows the municipality itself to be a part of the flow. [In addition,] networks may strengthen the participant's ability to attract investments from the private sector and from public funding to bring about sustainable development, and they are a source of inspiration, knowledge, and shared experiences that may create new technologies and change in citizen attitudes and behavior. (Gustavsson, Elander, & Lundmark, 2009, p. 69)

Networks "blur the hierarchical picture" (Salet, 2006, p. 5) and are providing a venue for participants to cross scales and contribute in meaningful ways to global environmental governance (Gustavsson et al., 2009). "Networks are emblematic of the shift from "government" to "governance," or from hierarchical to networked governance" (Bäckstrand, 2008, p. 74). They are a form of self governance where decisions are directly implemented by their members. Kern and Bulkeley (2009) characterize transnational municipal networks as "networks of pioneers for pioneers" (p. 329).

Several studies mention the value of networks in sharing resources and expertise and implementing projects (Anders, De Haan, Silva-Send, Tanaka, & Tyner, 2009; Lundqvist & Biel,

2007). One particularly useful function is the standardization of climate change emission calculation and reporting. This is generally a tedious and resource intensive task, but ICLEI, an international network of local governments, has developed user friendly software to assist local governments in this task (Anders et al., 2009). “There are strong incentives for local government to engage in inter-municipal cooperation to gain economics of scale in, for example, large infrastructure investments” (Lundqvist & Biel, 2007, p. 9).

There are numerous networks and non-profits working on growing climate change mitigation throughout the world. The examples below illustrate the networks most significant to the United States as a whole, and also those that are particularly relevant for the Pacific Northwest region and King County’s efforts.

United States Mayors’ Climate Protection Agreement. One of the most successful efforts in the United States in local climate action is the US Mayors Climate Protection Agreement (MCPA) initiated in 2005 by former Seattle Mayor, Greg Nickels (US Conference of Mayors, 2009a). In spite of a lack of national commitment, Mayor Nickels announced that Seattle would meet the Kyoto Protocol target to reduce emissions 7% below 1990 levels by 2012 and encouraged other cities to take action. Mayors from 1049 cities have signed on to the agreement, and the number continues to climb. The United States Conference of Mayors Climate Protection Center is supporting and expanding this effort.

United States Conference of Mayors Climate Protection Center. The U.S. Conference of Mayors Climate Protection Center opened in 2007 to provide mayors with tools and guidance to achieve emission reductions, to provide a forum to share successes and challenges, and to increase the number of cities committed to this effort. “The establishment of the Mayors Climate Protection Center … acknowledges that while mayors recognize the need for a federal partner in

this effort, they cannot and will not wait to act until Washington is ready to move on this problem" (USCM, 2009a). One of the major successes of this joint effort is the development of the Energy Efficiency and Conservation Block Grant (EECBG) Program for cities, counties and states to receive grants to fund energy-efficiency projects (USCM, 2009a).

International Council for Local Environmental Initiatives (ICLEI). ICLEI – Local Governments for Sustainability is the best known international organization working with local governments on climate change action. It provides "technical and policy assistance, peer networking opportunities, and general expertise to local governments on climate change emissions reductions" (King County, 2007a). ICLEI has developed formulas and computer programs to help local governments quantify and report on their emissions. The Cities for Climate Protection Program (CCP) was created by ICLEI in 1993 and focuses on mitigation, adaptation and advocacy. It's members include nearly 1200 participating jurisdictions from more than 30 countries worldwide (ICLEI, 2009).

The Climate Registry. The Climate Registry is a nonprofit organization that attempts to establish consistent standards for business and government emission reporting throughout North America. It provides online training for GHG accounting, conducting an emission inventory, and reporting GHG emissions. Their goal is to establish a common data infrastructure for emissions reporting (TCR, 2010). This appears to be the emerging standard (M. Kuharic, personal communication, October, 2010). Networks have proven highly successful in addressing climate change actions. They provide resources and support and enable jurisdictions to share information with each other more readily. Norberg and Cumming (2008) find that social networks play a critical role in "generating visions and ecological knowledge and connecting this to management and governance of a social-ecological system" (p. 119). Most of the networks

require a fee to join, and some of the services require additional fees. Each network provides specific resources and benefits (see Table 2.1), with some overlap and possible competition with other networks.

Table 2.1

Major Networks and Services Available to Local Governments

	Mayor's Climate Protection Center	**ICLEI's Cities for Climate Change Program**	**The Climate Registry**
Provides Technical Assistance and Training		Local representatives, workshops, seminars, International Training Center	Online training for calculating emissions and using software, supports mandatory reporting
Provides Technical Information	Website, reports, surveys, conferences	Emission software, website, conferences, research and reports	Online emission calculating and reporting software, directory of resources, emission reports
Secures Financial Assistance	Block grants		
Provides Financial Information	Website, reports, conferences	Website, reports	
Fosters Collaboration	Conferences	Facilitates networking, conferences, newsletter	
Coordinates Legislative Advocacy	National legislation	National and International policy	

In addition to the contribution climate action networks are making to empowering local government political action, citizen support is also crucial. Recent surveys indicate that citizen support for climate action is high. Over 90 percent of Americans favor investment in solar, wind, and other alternative energy sources (Gillespie, 2001) and 83 percent want the national government to take more leadership on climate action and to support local efforts (Opinion Research Corporation, 2006). Local governments are more representative of citizen's interests than are national governments and they provide a stronger voice for the people that appears to be silenced by national politics.

An important note is that the theories presented here are in disagreement with the conventional theory of collective action, which predicts that no one will reduce emissions without externally imposed regulations at the global scale (Brennan, 2009; Ostrom, 2009). New research in this realm finds that this conventional theory does not apply to numerous small to medium size groups who are cooperating and taking action. More research in this area is clearly warranted (Ostrom, 2009; Poteete, Janssen, & Ostro., 2010).

Sphere of Influence over Mitigation Activities. Local climate change mitigation action in democratic states generally includes participatory governance and promotes policy coherence through strategic planning. It can also encourage experimentation and innovation and "deliver cost effectiveness and economic efficiency" (Corfee-Morlot, et al., 2009, p. 87). Cities can "more easily identify and combine complementary climate policies within and across sectors than higher levels of government, given the interconnectedness of urban policy sectors" (Kamal-Chaoui & Robert, 2009, p. 79). In efforts to address climate change mitigation and other environmental concerns, many cities are instituting sustainability policies and striving to reduce consumption and their ecological footprint through municipal operations management, policies and regulations, and community outreach and incentive programs (ICLEI, 2009). Efforts range from small-scale, such as replacing street lights with high efficiency bulbs, to large-scale, such as integrating sustainable transportation systems with land use planning. "Properly planned cities provide both the economies of scale and the population densities that have the potential to reduce per capita demand for resources such as energy and land" (United Nations, 2010, p. v).

The causes of climate change are local every day activities of individuals, industry, and communities. GHG emissions are generated from driving cars, growing food, heating homes, transporting water, lighting buildings, watching television, managing waste, and so on. Local

governments have influence over many aspects of these activities, such as energy supply, building requirements, and waste management. One of the most difficult sectors of emissions to control is that of transportation. An effective method of limiting vehicle miles travelled (VMT) is strategic spatial land use planning. This is largely accomplished through city, county, and multi-county planning efforts.

In addition to the practicality of local action to mitigate climate change, there are incentives at the local scale generated by the opportunities to achieve short-term co-benefits (Calthorpe, 2010). Reducing emissions contributes to improved air quality, which in turn has numerous health benefits. Increasing energy efficiency can generate tremendous cost savings for individuals, government, and industry. Reducing the amount of time spent in traffic can improve quality of life for individuals and families. In addition to these local benefits, there are also long-term benefits of minimizing sea level rise and glacier melting that will have global implications.

GHG emissions do not have political or administrative boundaries, yet the emissions are generated at a local scale. Local governments are in many cases better equipped than national government to address the planning and implementation of mitigation actions through stronger support from constituents, collaboration with networks, and local jurisdictional responsibility and influence. This confluence of local climate politics, local climate activities, and collaborative efforts is expanding the breadth and scope of mitigation at the local level.

Policy Tools and Strategies. Local and state governments that are involved in climate change mitigation are generally employing policy instruments that either utilize a command-and-control approach, such as requirements to meet standards or targets and employ new technologies, or an economic incentive approach that relies on market forces, such as tradable permits, grants, loans or tax incentives (Ciocirlan, 2008). Some jurisdictions are finding success

in integrating both approaches. Regional and international networks have been developed that are supporting these efforts and increasing the realization of these policies.

A standard approach to local level climate action policy formation is to establish a working group, discuss goals, potential areas of action, priorities, implementation strategies and monitoring mechanisms (Hourcade, Jaccard, Bataille, & Ghersi, 2006). There are numerous considerations with new policies, such as evaluating the effect on human behavior, technology status and availability, and market feedback to determine the quantity of emission reductions compared to the cost of implementation. “The ideal model for climate policy analysis should be technologically explicit, behaviorally realistic, and macro economically realistic” (Hourcade et al., 2006, p. 1).

Co-benefits of climate policies at local level. The achievement of co-benefits at the local level contributes to the effectiveness of mitigation efforts. Co-benefits are defined as effects that are in addition to direct reductions of GHG emissions and impacts of climate change (Bollen, Bollen, Gua, Jamet, & Corfee-Morlot, 2009). When analysts and decision makers develop and adopt policy, they consider the potential costs and benefits that will be derived from implementation. The ability to achieve co-benefits, such as cost-savings, improved air quality, preservation of water quality, human health benefits, or increased energy efficiency makes mitigation policies much more appealing to local governments who have limited resources and must balance priorities. Reducing energy use has the ability to lower investment costs for energy suppliers and consequently improve affordability for homeowners, and reducing vehicle miles travelled could result in a reduction in traffic congestion, which, in addition to lower emissions, could reduce commute times and improve quality of life (Corfee-Morlot, et al., 2009). Local governments are using co-benefits to localize and justify climate issues to the public and to

achieve multiple goals simultaneously, and with less effort then if addressed separately (Kousky & Schneider, 2003).

"There is a potentially large and diverse range of collateral benefits that can be associated with climate change mitigation policies in addition to the direct avoided climate impact benefits" (Bollen et al., 2009, p. 5). Mitigation actions that target clean energy or energy efficiency are likely to realize improvement to air quality, "which in turn limit risks to human health and improve local environments" (Bollen et al., 2009, p. 5). There are also potential social benefits achieved through community building that can be realized by creating close-knit, walkable neighborhoods. Numerous actions to reduce emissions, such as energy and water efficiency measures, can also reduce costs, saving jurisdictions much needed funds.

Gaining market advantage is another co-benefit that some jurisdictions are embracing. Pioneers in climate change action are showing that climate change mitigation regulations and actions do not necessarily inhibit economic growth, but rather allow these leaders to gain market advantages (Jänicke & Jacob, 2004). In China, climate change mitigation efforts were previously believed to slow economic growth due to a reduction in energy use (Pan, 2003). China's national and provincial policies, however, have recently shifted in part due to the recognition of the opportunity for market advantages (Davis, Caldeira, & Matthews, 2010). The ability to realize co-benefits is a motivating factor for many climate change mitigation actions.

Examples of locally-based, emission-reducing transportation policies and actions. Transportation is a large source of emissions worldwide and the largest source of emissions in the Puget Sound region where King County is located. It is also one of the most difficult sectors to deal with for numerous reasons, the first being that it has one of the most entrenched infrastructural systems within our society. In many ways, our society is built on the car.

Changing this system requires systemic changes at all levels of government. Studies have shown that it is more effective to address GHG emissions from cars by looking at it through a pollution mitigation approach, rather than a GHG mitigation approach (Yedla, Shrestha, & Anandarajah, 2005). This strategy appears to give local authorities more leverage. To really address the issue comprehensively, tremendous expenditures in infrastructure would need to be made. Most cities cannot afford this but are still finding ways to create change through smaller investments and strategic planning for future development.

The primary goals in transportation policy related to climate change mitigation are to reduce vehicle miles travelled (VMT), shift to more fuel efficient or alternative vehicles such as hybrids or electric cars, and shift to low carbon fuels. In an effort to encourage low carbon fuels, at least 17 states have adopted vehicle emission standards that could potentially "create a large subnational market that might force the motor vehicle industry to develop more fuel-efficient models" (Wheeler, 2008, p. 485). In King County and the surrounding region, the Puget Sound Clean Air Agency was able to negotiate agreements with all the local refineries to switch to low sulphur gasoline.

The use of low carbon vehicles has grown exponentially and is expected to substantially increase in the near-term in the Pacific Northwest region. King County government and several of its jurisdictions are currently focused on establishing infrastructure and providing incentives for low-carbon vehicles. Through several grants from the U.S. Department of Energy, Clean Cities Coalition (a project of the Puget Sound Clean Air Agency), the Energy Efficiency and Conservation Block Grant program, Nissan USA and eTec, a manufacturer of electric vehicle charging stations, King County will receive funding for several charging stations at no cost (King County, 2010a). Approximately 1000 charging stations will be placed in the King County

region in coordination with Nissan's release in the Central Puget Sound region of its new electric vehicle, the Nissan Leaf. This effort represents the largest public investment in electric vehicle infrastructure in the United States (King County, 2010b). Other efforts in this arena include incentives such as those used in Vaxjo, Sweden where parking is free for low-carbon vehicles and there are municipal subsidies for purchasing low-carbon vehicles (CCI, 2010).

Reducing VMT can be achieved through land use policies that promote compact development and contain urban sprawl, increased transit options and road pricing (Ewing, Bartholomew, Winkelman, Walters, & Chen, 2008). One of the primary planning efforts being seen globally is development of an interconnected transport system and land-use pattern that encourages walking, biking and public transit. Integration of "land-use and transport policies that allow for compact cities to develop with cluster of high-density nodes" (Corfee-Morlot et al., 2009, p. 36) is a critical component that helps lay the foundation for climate change mitigation policies. A good example of this on a small scale is that of Whistler, British Columbia, Canada. Whistler's municipal area comprises 24,378 hectares. Once you arrive at this resort community, if you are able bodied, you can park your car and forget about it. The village itself is self-contained with shops, restaurants, lodging, and recreation and is connected to the surrounding residential area, golf course, lakes and hiking areas, and other amenities by a pedestrian and bike friendly trail system. Most of Whistler's existing residential neighborhoods are situated in nodes along the 15.8 kilometer stretch of the main highway.

The Whistler community is currently in process of replacing its existing Comprehensive Development Plan with a Comprehensive Sustainability Plan. It is a long-term plan with an adaptive management component that has the end goal of achieving a sustainable, low-footprint community. The Whistler Centre for Sustainability (WCS) is facilitating the community process.

On a larger scale, Denver, Colorado's FasTracks program, a light and commuter rail program, covers 119 miles and includes 57 transit stations with opportunities for transit oriented development. This will help reduce sprawl and create pedestrian and bike friendly environments. Voters authorized a sales tax to pay for the 12-year expansion (ICLEI, 2009).

Future and existing transit-oriented developments provide an opportunity to reduce greenhouse-gas emissions by integrating new conservation and energy efficiency technology with land-use and transportation planning. King County is planning to develop hubs that provide frequent, regional, multi-destination public transportation service, technology to support public use of plug-in electric vehicles and other programs to support vehicle-sharing (King County, 2010c).

Road pricing, such as tolls, is another tool utilized to reduce use of single occupancy gas fueled vehicles. In a recent survey of Pacific Northwest cities, one fifth of cities responding said they are implementing road pricing policies as an economic disincentive to reduce trips or miles traveled (Rice, 2008). Road pricing can be accomplished through numerous methods, such as fixed rate road tolls, time-variable congestion pricing intended to shift some vehicle traffic to other modes, cordon fees for major urban centers, a vehicle use fee based on how many miles a vehicle is driven or Pay-As-You-Drive insurance that "prorates premiums by mileage so vehicle insurance becomes a variable cost" (Victoria Transport Policy Institute, 2010).

A unique example of transit-oriented solutions is that of Chapel Hill, North Carolina. Chapel Hill, the neighboring Town of Carrboro, and the University of North Carolina all collaborated to offer a fare free transit system on a community wide basis. Not only has this solution doubled ridership and made this a community where people do not need to rely on the automobile, it has

also increased social equity within this region by allowing everyone the freedom to travel without any money (ICLEI, 2009).

Other regions are focusing on encouraging bicycle riding by adding bike lanes and trails. Copenhagen is called the City of Cyclists and has over 36% of the city's population cycling to work every day. Frieburg, Germany as well boasts that “a third of all journeys are by bike” (ICLEI, 2009) and Bogotá has one of the world’s most extensive cycling systems. Bogotá has also implemented a Bus Rapid Transit System that has “reduced traveling time 32%, reduced gas emissions 40% and reduced accidents 90%” (ICLEI, 2009). There are many examples of these types of efforts being implemented and greatly reducing emissions.

In 2008, a Santa Barbara non-profit group called the Sustainable Transportation Advocates of Santa Barbara sued the Santa Barbara County Association of Governments over inadequate assessment of GHG reduction needs in the final Environmental Impact Report (EIR) for the 2008 Santa Barbara County Regional Transportation Plan (RTP). The concern of the advocacy group was that the RTP was focused on a freeway expansion, which would bring additional GHG emissions, rather than increased transit options that could reduce GHG emissions. The court found in favor of the petitioner and ordered the EIR and RTP void until the County Association provided sufficient detail on energy use and consumption patterns and provided an analysis of the energy impacts of the RTP (COAST, 2010).

According to the Sustainable Transportation Advocates, transit options were not given initial priority because there is “an institutional bias against transit users by transportation planners and political leaders” (COAST, 2010). They also identified problems with “development patterns that encourage sprawl and low density” (COAST, 2010). The transportation problem is ubiquitous across most of the United States and industrialized countries. People like the

independence that cars provide and traditional land use practices that are entrenched in a "culture of sprawl" and consequent local government decision-making processes do not support an overarching need to reduce vehicle miles travelled (Stern, 2008, p. 615). The success or failure of transportation policies "in the land use context will largely depend on a basic question of political will: do enough voters desire a new American dream, where a car and a house with a lawn are replaced with a bicycle, a condo, and environmental piece of mind?" (Stern, 2008, p. 614).

Examples of locally-based, emission-reducing land use policies and actions. Land use zoning in urban areas is critical to addressing GHG emissions, particularly from transportation. Spatial planning shapes where we develop, how we get there, and how far we travel. "Land-use zoning policies have a wide-ranging, long-term, and underlying effect on sectoral policies to address climate change…" They "impact transportation policies that aim to reduce GHG emissions by determining the degree of segregation among land uses and therefore the energy required to travel between home, work, shopping and other activities" (Corfee-Morlot et al., 2009, p. 81). Many established jurisdictions are now trying to work within the confines of established infrastructure and systems that are expensive and often socially challenging to change.

Effective zoning policies can provide a framework for new and sustainable development, and in some cases re-development. Zoning is often restrictive in the United States and does not allow for small businesses or multi-family housing in residential zones, as opposed to Germany where the zoning laws are more flexible. Establishment of mixed-use zones and allowing for transit-oriented development can reduce transportation emissions (Kamal-Chaoui & Robert, 2009).

Land use policy and regulations can be valuable tools for local governments in mitigating climate change through a shift to a comprehensive resource specific focus. This approach could systematically assess, evaluate, and coordinate all land use activities through the lens of resource sustainability and protection, rather than through an activity focused piecemeal approach, as is currently done in many jurisdictions (Hirokawa, 2009). Forward thinking agencies are beginning to implement changes that are moving towards this type of approach.

Some of the most effective strategies being developed include rethinking and most importantly integrating land use, zoning, building, energy production, and transportation policies to develop sustainable communities (Salkin, 2009). This is being accomplished through regulations and incentives, such as green development codes, compact city planning, and sustainable transport advancement. In many North American cities energy use in the transportation sector is up to "four times greater than that of Western European cities due to poor land-use planning decisions that create sprawl and reduce the effectiveness of public transportation options" (Krajnc, 2003, p. 104). Future zoning needs to comprehensively address the systemic socialecological sustainability issues and move beyond the current Euclidean zoning that can "stifle mixed use developments that may help reduce auto traffic and air pollution" (Duerksen, 2008, p. 30).

The Rocky Mountain Land Use Institute at the University of Denver School of Law is developing a sustainable community development code to assist local jurisdictions with these challenges. It is focused on:

- Removing obstacles such as prohibitions of wind turbines or solar panels in zoning rules and design standards and allowing urban agriculture;

- Creating incentives such as increased density or height allowance in exchange for utilization of new technologies like green roofs;
- Enacting mandatory regulations to take essential actions, such as tree retention or wetland protection; and
- Utilizing smart and simple development technologies, such as passive solar (Duerksen, 2008).

Other locally-based, emission-reducing policies, tools, and strategies.

Green buildings. Buildings account for a significant portion of GHG emissions, approximately 23 percent in the Puget Sound region, excluding electricity usage. Innovative green development is achieving many co-benefits and is being adopted in cities throughout the world. Austin, Berkeley, Berlin, Freiburg, Melbourne and many more are all adopting green building standards. Seattle has set a high standard in the United States, but Frisco, Texas was the first city in the US to adopt a mandatory Residential Green Building Program (ICLEI, 2009). The program focuses on waste reduction, pollution reduction, water conservation, energy conservation, and sustainable development. Dongtan, China aims to be the world's first carbon neutral sustainable city, complete with all green buildings, both residential and commercial (ICLEI, 2009).

Energy efficiency. Electricity use is the next highest emitting sector at 17 percent in the Puget Sound region. This is one of the relatively easiest areas to make changes in and there are numerous cost saving efforts being implemented.

Street and traffic lighting. Several jurisdictions, including the City of Seattle and King County have installed energy efficient street and traffic lighting and have saved money. Ann Arbor conducted a street lighting pilot project and reduced energy use by 80%. Chicago realized

an 85 percent saving in energy use, and Oslo, Norway reduced energy consumption by 70% (ICLEI, 2009).

Renewable energy. Washington has a huge source of renewable energy through its hydropower infrastructure. Some of the downsides, however, to this are the sacrifices that were made by the wildlife that depend on the rivers and the human societies that were displaced by the dams. Nevertheless, it has provided clean energy to all of Washington, and to parts of California as well. Other primary sources of renewable energy being utilized are solar and wind. Waste products and garbage are also being utilized to generate energy, and sea water and the ground are being utilized as heating sources.

San Francisco has the largest city-owned solar power system in the United States. Freiburg is also primarily energized by solar. Ninety-seven percent of Copenhagen City heating is supplied by waste heat and the Hague in the Netherlands is using seawater to heat homes. Vaxjo, Sweden, has reduced heating emissions by 75 percent due to a conversion from oil to biomass. Barcelona has implemented an ordinance requiring solar-heated hot water and Copenhagen has an off-shore wind farm that powers 150,000 Danish households. Reykjavik, Iceland has the world's largest geothermal heating system and Serpa, Portugal has the world's largest photovoltaic solar power plant.

The City of Helsinki has managed to maintain emissions at a 1990 level, primarily because the city's power company switched from coal to natural gas. This is in contrast to the national level where the emission levels are increasing. Helsinki has also incorporated other emission reducing policies and actions, such as promoting the use of biofuels for transportation, collecting landfill gas and sorting biowaste, and increasing energy performance in buildings. An area where Helsinki was not performing well was utilizing renewable energy sources. The motivation

behind Helsinki's efforts was not examined in-depth, although it does appear that efforts have realized economic benefit (Monni & Raes, 2008). As is illustrated by these many examples, the technology to achieve GHG emission reductions in the energy sector is highly evolved and well functioning (ICLEI, 2009).

Sustainable waste management. Many cities are reducing landfill disposal and creating waste-to-energy systems. This serves to reduce emissions, create energy, and save money. Copenhagen only puts 3 percent of waste into a landfill and utilizes 39 percent to produce energy, with the rest being recycled (Sustainable Cities, 2010). King County has the world's largest digester gas fuel cell demonstration project. Sao Paulo has installed a thermoelectric power plant to burn biogases emitted by waste. Toronto is generating $3-4million annually by capturing methane. There are many great examples of functioning systems throughout the world (ICLEI, 2009).

Offsets. A carbon offset is a financial instrument that is used to reduce total emissions when full mitigation and sequestration are not possible. It can be used in either the compliance market by companies or governments to comply with caps on the total amount of emissions allowed, or in the smaller voluntary market to mitigate individual, company, or governmental emissions. In 2008, about $705 million of carbon offsets were purchased in the voluntary market, representing about 123.4 million metric tons of CO2e reductions (Hamilton, Sjardin, Shapiro, & Marcello, 2009). Forty-one percent of the jurisdictions that responded to a recent Northwest US survey are purchasing voluntary offsets to reduce their GHGs (Rice, 2008).

Internal incentives. Directives in China are now linking climate change mitigation at the local level to career advancement opportunities for local political leaders. In the past, career advancement for local officials was highly dependent on economic growth within their

jurisdictions. With the national government's new edict to reduce carbon emissions and save energy, however, a new component to the performance evaluation and consequent promotion of local officials is being implemented. Local officials now have emission reduction targets to meet and they are striving to meet them (Qi, Ma, Zhang, & Li,2008).

Critical variables. Variables such as economic drivers, prior land use planning, or cognitive perceptions can influence which strategies are employed and which will achieve higher emission reductions. On one hand, in areas where much of the economy is dependent on carbon-intensive industries, climate mitigation effort will likely be emphasized for non-industrial emission producing areas. On the other hand, in areas where a large majority of citizens vote Democrat, have comprehensive recycling programs, and have numerous nonprofit organizations with an environment focus, there is a strong correlation with significant climate change mitigation actions (Zahran, Brody, Vedlitz, Grover, & Miller, 2008). Another variable is the geographic distribution of natural resources and, in particular, rivers that generate hydropower. In the Pacific Northwest, for example, hydropower is a renewable and carbon-free source of energy. Consequently, in Seattle, King County and other Western Washington cities, cars are the largest source of GHGs (PSCAA, 2007). In other parts of the country and the world, coal-fired power plants are the primary energy source and the largest carbon source as well.

The City of Seattle and King County have several additional variables that have contributed to its success. One of the most important is a culture of sustainability, both within city and county government and the general citizenry. Second, both jurisdictions have had strong leaders. Another important variable is that the staff at the County and especially the City is trained and up to speed on sustainability issues and the planning and analysis tools and techniques needed to

address these major concerns (Rice, 2008). These types of variables will determine which strategies and programs will be most effective and best received.

GHG emission inventories and reporting. Conducting greenhouse gas emission inventories has a strong relationship to emission reduction efforts and is a significant initial step towards climate change action. In a survey of Northwest local governments that have either signed onto the Mayors' Climate Protection Agreement or the Cities for Climate Protection agreement or both, about half of the jurisdictions have conducted a GHG inventory and have adopted an emissions reduction goal for their entire jurisdiction (Rice, 2008). Increasing awareness across the board of what actions are generating emissions provides impetus to initiate and sustain action. There are a few emission software companies providing products and advice, as well as some local utilities, and some have partnered with the primary climate action networks, identified in Table 2.2.

For jurisdictional operations there is accepted protocol and methodologies for calculating and reporting emissions. The Climate Registry is becoming the emergent reporting standard for the United States (Kuharic, 2010). However, for community emission calculations and reporting, the multitude of software options and methods of calculating has created a disparity. However, there is not one standard for everyone, which makes it very difficult to compare jurisdictions or efforts. It also makes it difficult for jurisdictions to partner with each other on this task. Nevertheless, any effort to calculate emissions and report on them is widely seen as a positive step.

Table 2.2

Policy Tools and Strategies Employed at the Local Level

Transportation	Energy	Waste Management	Built Environment	Public Outreach	Land Use Policies	General Climate / Sustainability Policy	Funding
Electric car infrastructure[2]	Energy efficiency & conservation[1]	Waste prevention: recycling[1]	High energy efficiency standards in new buildings[1,5]	GHG Speedometer[1]	Mixed use zoning[5]	Emissions inventory Completing an emissions inventory Setting emission reductions goals Reporting emission reductions	Carbon Taxes[5]
Mobility management for employees[1]	Establish renewable energy portfolio[1,4]	Composting[1]	Green government buildings[4]		Compact development[5]	Comprehensive Plan[6]	Grants[6]
Green fleets[1] Green buses/ transit[2]	Purchasing green energy[1]	Procurement of recycled goods[1]	LEED standards[4]			Sequestration through planting trees, encouraging gardens, and green roofs Organic agriculture	Road pricing[8]
Reduce VMT and need to travel [1] (multi-modal and cluster communities; telecommuting)		Landfill methane capture[2,5]	Green infrastructure[5]			Development of climate action plans Creation of climate task forces and coordinators[6]	
Transit options[1]						Joining regional climate networks[6]	Implementing emissions fees and taxes[6]
Increased vehicle emissions standards[4]						Integration of climate change mitigation actions into long-term planning[8]	
Pedestrian/bike friendly design[5]						Thinking locally and acting locally[6]	
Eat local programs[2]							
Reducing sulfur content of fuels[7]							

[1] J. Corfee-Morlot et al., 2009
[2] King County (2007c)
[3] Kamal-Chaoui and Robert, 2009
[4] Wheeler, 2008
[5] Tang et al., 2010
[6] ICLEI, 2009
[7] Changhong et al., 2001
[8] Pew Center, 2009

Theoretical Framework of Collaboration and Climate Action at the Local Government Level. This section draws from theories dealing with collaboration, cultural transformation, relational practice, social networks, transformational leadership, complex adaptive systems, and Participatory Action Research. Each one of these theories encompass studies and findings that contribute to understanding how government action can be enhanced and improved by creating a collaborative, creative, non-hierarchical space and process where multiple government entities can join together to create action. None of the individual bodies of work fully provides an appropriate framework for this study. However, each provides theoretical explanations that can be uniquely integrated to consider the questions addressed in this research. The following summary of theories depicts relevant aspects of each theory that contribute to the theoretical framework for the research in this dissertation.

Theories of Collaboration. There are numerous definitions and dimensions of collaboration. The definition that best suits this study was derived from a combination of in-depth comprehensive analysis of the theoretical literature by Wood and Gray (1991) and field research conducted by Thomsen, Perry, & Miller (2009):

> Collaboration is a process in which autonomous or semi-autonomous actors interact through formal and informal negotiation, jointly creating rules and structures governing their relationship and ways to act or decide on the issues that brought them together; it is a process involving shared norms and mutually beneficial interactions. (Thomsen et al., 2009)

Collaborative governance of social problems has steadily increased over the past two decades (Ansell & Gash, 2008; Huxham & Vangen, 2000). Most of the studies focus on collaboration between public and private stakeholders engaging in consensus-oriented decision making. Ansell and Gash (2008) reviewed 137 cases of private/public collaborations and identified factors that were crucial for a successful collaborative process, which included face-to-face meetings and relationship and trust building. They also found that small wins can "deepen trust, commitment,

and shared understanding" (Ansell & Gash, 2008, p. 543).

This study is centered on collaboration and the idea that a collaborative process would benefit the participants and help to bring about desired change. Additional benefits of collaboration that this research focuses on include the increased propensity to develop an interdisciplinary and systemic approach (Senge, 2006); build capacity and knowledge through creating a learning community (Peat, 2008; Reason & Bradbury, 2008; Salk, 1983) promote entrepreneurial activity (Covin & Miles, 1999); increase efficiency and effectiveness (O'Toole, 1995); build trust, relationships, and commitment (Eisler, 1987); and foster motivation and create meaning (Senge, 2006). Collaboration can achieve these benefits by allowing a broader range of perspectives and encouraging creative use of reason and intuition through a non-hierarchical structure (Peat, 2008; O'Toole, 1999; Salk, 1983). Collaboration allows voice and inclusion, which are drivers of motivation (O'Toole, 1999). In sum, collaboration provides the medium in which to develop meaning (Senge, 1999).

Cultural transformation theory. The theoretical underpinnings of collaboration as a driver for change are relatively new, however it is recognized in cultural transformation theory as an important aspect to evolving partnership societies where the focus will be "more on relationships than on hierarchies" (Eisler, 1987, p. 191). The idea of utilizing partnership and collaboration for change and ultimate transformation has been documented in numerous studies of organizational development where employees are included in system-wide collaboration, strategic discussion, and development and implementation of action plans (Boyatzis, 2006; Cooperrider, Sorenson, Whitney, & Yaeger, 2000; Kolb & Boyatzis, 1970; Van Oosten, 2006). Through appreciative inquiry summits meant to foster cultural transformation, organizational members have become engaged and energized and management style has shifted from a command-and-control model

toward a more collaborative and appreciative management approach (Cwiklik, 2007). This study is similar in that it utilizes some of the same principles such as focusing on relationships and minimizing hierarchy. It also used workshops to collaboratively develop strategies.

Relational and social network theory. The aspects of relational theory that are relevant to this research are found within the context of social network theory. Relational theory, in this context, relates to motive in that relationships are the underlying motivation for action (Okubo & Kurosawa, 2003), and power in that distributive power is relational (Okereke et al., 2009). Social networks focused on transformation utilize collaboration, flat hierarchy, and relationships to create motivation and change (Betsill & Bulkeley, 2006b). Within networks, developing relationships and empowering individuals through collaboration are integral to successful outcomes (Wasserman & Faust, 1994).

"Collectively, the focus on transnational networks marks a shift within the discipline of international relations from a preoccupation with hierarchical structures toward an appreciation of the importance of network forms of organization" (Betsill & Bulkeley, 2006a, p. 148). Within networks, individual entities are viewed as interdependent rather than independent, relational ties are recognized as integral to operational structure and sustainable outcomes, and the focus is on the empowerment of a collection of individuals (Wasserman & Faust, 1994). This study focuses on networks for local governments and seeks to confirm previous research on the sense of empowerment achieved through these avenues.

Complex adaptive systems theory. Peter Senge, in The Fifth Discipline recognizes that all the disciplines are "concerned with a shift of mind from seeing parts to seeing wholes" (Senge, 1990, p. 69). Senge argues that one of the key problems when addressing large scale change is that simplistic frameworks are applied to complex systems. Thus, he concludes, an increased

appreciation of the interplay of systems will lead to more efficient solutions. "In the new systems worldview, we move from the primacy of pieces to the primacy of the whole, from absolute truths to coherent interpretations, from self to community, from problem solving to creating" (Kofman & Senge 1993, p. 6). Meadows and Wright (2008) echo this need to encompass the whole picture and appreciate the complexity of systemic organization and organic synergy. "You think because you understand one you must understand two, because one and one make two. But you must also understand 'and'" (Meadows & Wright, 2008, p. 12).

In "System Failure: Why governments must learn to think differently," Chapman (2004) says that the current model of public policy making that looks at complex problems in small pieces rather than as a collective whole is not appropriate for the challenges currently faced by governments. There will be unintended consequences and long-term failure. Chapman (2004) suggests using systems thinking to treat public services as complex adaptive systems.

In this context, adaptive management is one practical application of this by integrating research, design, management, and monitoring in order to adapt and learn and understand what works or doesn't, and why. Principles of adaptive management include valuing curiosity, innovation, and failures; capitalizing on crisis; creating learning organizations and networks; and contributing to global learning (Margoluis & Salafsky, 1998). Adaptive management is not always successful. Many large-scale applications have failed, largely due to inflexibility within the system, a lack of trust, or a lack of ecological resilience. Success of this approach requires informed leadership, effective information processes, and collaboration with social networks (Norberg & Graeme, 2008).

As part of this research process I designed a collaborative, creative, non-hierarchical space with the intent to encompass a holistic approach that reflected the systemic complexity of

addressing climate change. We went into the process with an open agenda, embracing uncertainty and allowing the process to unfold organically. The inclusive strategy development followed in this study focuses on allowing all perspectives to be considered, thereby enhancing the ability of participants to learn from each other and take a multi-disciplinary approach. This study was not designed to be adaptive management, but the basic tenets are similar.

Theories of transformational leadership. Transformational leadership theory relates to this study in that it allows for creativity, intelligence, and thoughtful solutions and is associated with "change efforts and organizational visions that inspire, motivate, and empower followers" (Hansen, Ropo & Sauer, 2007, p. 550). Transformational leadership allows leaders and followers to engage in a mutual process of "raising one another to higher levels of morality and motivation" (Burns, 1978, p. 20).

A transformational leadership paradigm encourages individuals to transcend their own interests for the common good and the well being of others (Feinberg, Ostroff & Burke, 2005, p. 471). Conversely, the authoritarian hierarchical nature of a transactional type of culture and leadership paradigm generally places the natural environment below the needs of human industry (Chew, 2001). This view is common among transactional leaders whose goals relate to increasing power and/or wealth; providing consideration for the natural environment generally has a lower value. The societal top-down hierarchical structure promoted by transactional leadership also promotes insecurity and fear that contribute to the scarcity mentality that fuels the drive to exploit natural resources (Vail, 2004). Nature is seen simply as a multitude of individual resources that serve an immediate purpose, not as the all encompassing foundation of human sustenance.

Participatory action research theory. Participatory action research is a method of inquiry that addresses an identified social problem in a collaborative manner to implement action for change. It is concerned with changing the culture of groups, institutions and societies through a participatory and democratic process that develops practical knowledge (McTaggart, 1989; Reason & Bradbury, 2008). It involves relevant parties in actively working to solve the problem and reach a goal through participation in developing methods, identifying solutions, and reflecting on and evaluating the process (Dick, 2002).

The philosophical theories and methods of attaining knowledge through Participatory Action Research were initiated with Kurt Lewin's (1946, 1958) models of action research and group dynamics. This is often considered 'traditional' action research. Based on Lewin's work, Huxham & Vangen (2003) argue that research for social practice should encompass "the dual purpose of bringing about practical transformation and of advancing knowledge" (p. 384). Lewin's (1958) primary interest was bringing about social change through an inclusive, collaborative, and pragmatic process.

Participatory action research is used in many different fields and has many diversified styles. The primary use today in developed countries is to empower groups and individuals to develop pragmatic approaches to complex social issues, and to improve decision making (McTaggart, 1997). The field of Participatory Action Research has greatly expanded and there are now many variations utilized in communities, local government, schools, industry, and organizations, led by all spectrums of society from students to principals, from staff coordinators to executive directors. The context of the research situation greatly determines the style and approach adopted. The questions of who is setting the agenda for social inquiry, who is involved in the process, and in whose interests is the outcome used are at the core of Participatory Action

Research. Utilizing Participatory Action Research in government settings has been found to increase motivation and reflection (Komarudin et al., 2006).

For the purposes of this project, Participatory Action Research methods allowed for a practical application of transformational change. It was particularly well suited for this research and to increase understanding and create change related to climate action because of its ideological and practical orientation to contribute to the well-being of society and the "the wider ecology of the planet of which we are an intrinsic part" (Reason & Bradbury, 2008, p. 2).

Fostering climate change actions in a local government setting: A theoretical framework. The approach presented in this chapter illustrates how important related theories can help increase our understanding of collaboration, motivation, and climate action with the intent being to apply this in the local government realm. Collaboration theory is a unifying theme that runs through the theories discussed. It relates to promoting relationships and partnerships. It also promotes motivation and encourages distributive power. Collaboration fosters a more systemic view of issues and encompasses a mutual process of engagement with leaders and followers. Finally, collaboration is the hallmark of Participatory Action Research which posits that collaborative action through a participatory democratic process can create social change.

The theoretical framework that emerges from the theories presented is that collaboration motivates and empowers individuals and groups to act by giving them a voice, a sense of meaning and a commitment to overarching goals. Further, critical to successful collaboration is a leadership context that is based on relational practice, an emphasis on sharing of resources and a focus on systemic, holistic perspectives. This fosters an interdisciplinary approach that is needed to bring about the desired fundamental third order change to "relationships and organizational boundaries and roles" (Waddell, Cummings, & Worley, 2007, p. 79).

This dissertation research seeks to create the potential for significant change in King County climate mitigation efforts through the use of a participatory action research process that is based on this theoretical framework. This study and action research attempt to show how this theoretical framework can be applied to a governmental setting and have significant impact on how people can work together to empower cities and towns and achieve progress towards climate change mitigation. In the following section I present how the application of this theoretical framework can provide an alternative governmental setting to foster climate change actions. In the next chapter I present a change strategy that indicates eight steps for producing change in organizations that is consistent with the participatory action change process employed in this research.

Typical local government operations.

Leadership perspective: Hierarchical, command and control oriented. In a typical local government operational scenario, local governments implement State and Federal mandates, as well as local initiatives in a hierarchical nature. Decision makers, such as elected city and county council members, mayors, city managers, and county executives take into consideration input from local stakeholders, regional organizations and agencies, and department directors, and then decide which actions to implement. These actions are delegated to the department directors who in turn delegate to their managers and staff. This scenario is depicted in Figure 2.1.

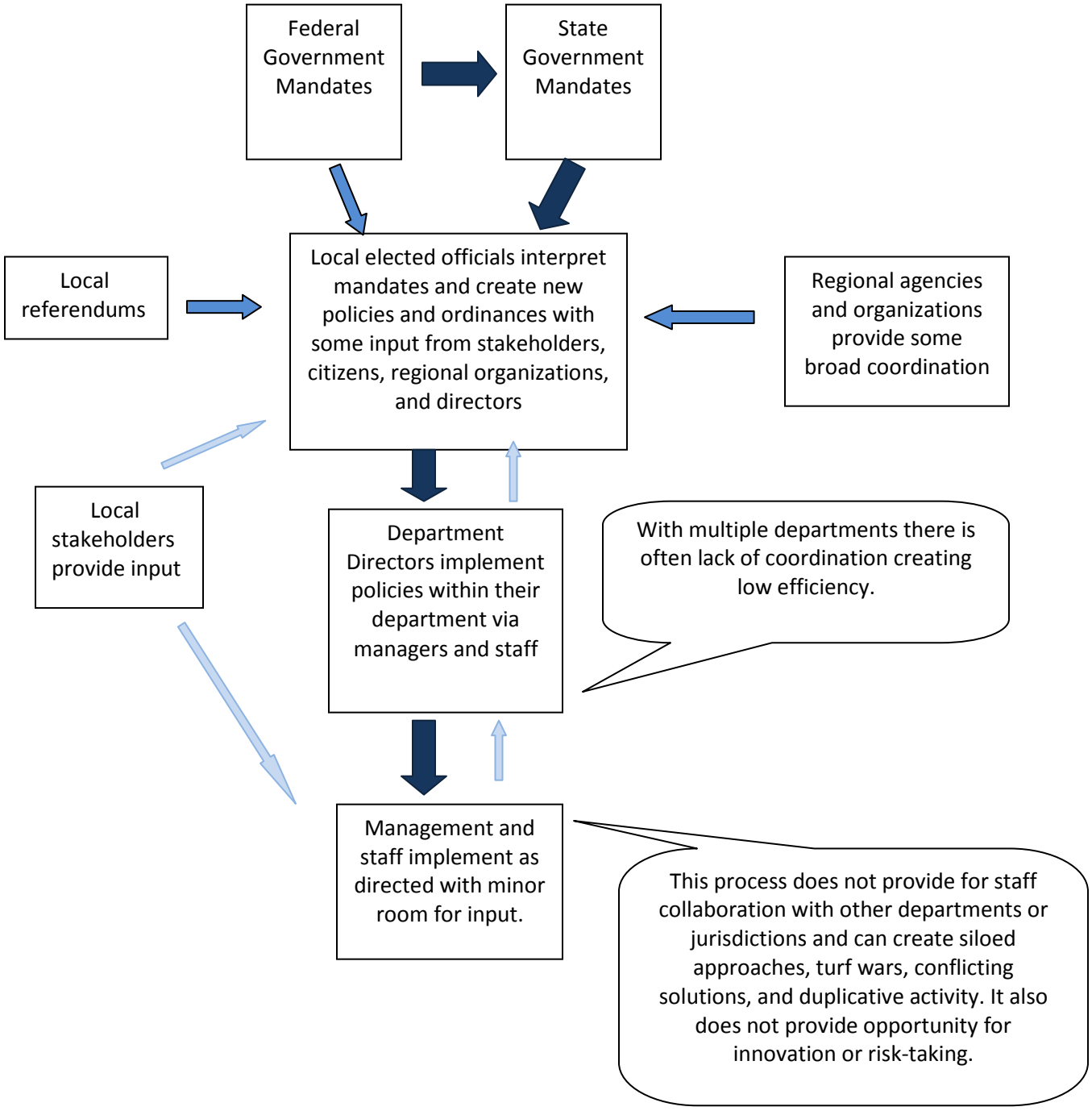
Organizational system: Bureaucratic, rule-based, siloed. This process is somewhat effective at implementing top-down directives, but does not usually provide for multi-department or interdisciplinary coordination, nor does it allow much room for bottom-up input, risk-taking or innovative solutions. Most departments and jurisdictions operate within a silo, creating artificial and real boundaries to developing and implementing policy solutions.

Result: Lack of engagement and risk taking, turf issues, slows action. This type of environment can lead to protection of turf, which undermines internal and external coordination and collaboration and creates inefficiencies. It can also create resistance of implementation due to a potential lack of buy-in from staff. This silo effect creates "dysfunctional segregation of policy disciplines often caused by differences in ideology, scientific fragmentation, and professional misunderstanding [that] limit the ability of one discipline to sufficiently interact with another" (Boschken, 2009, p. 1). When local governments operate in a siloed manner there is an absence of operational reciprocity (Boschken, 2009). Coordination and communication among departments is compromised, interoperability is impractical, and productivity is limited (Batty, 2008; Katz, Muro & Bradley, 2009).

This typical operations scenario provides for some coordination with regional entities, but it does not provide for bottom-up multi-jurisdictional collaboration. These boundary setting functions and top down actions tend to limit the resources available to achieve the type of change necessary to impact climate change. Climate change inherently lacks geographic boundaries and requires that jurisdictions that often do not have a history of working together share scarce resources. Also the political realities of governmental jurisdictions often lead to conflicting political perspectives and hesitancy to collaborate. This is a particularly difficult environment for implementation of climate change initiatives, which require cross-jurisdictional strategies, sharing of scarce resources, and experimentation (i.e., risk taking) with alternatives to determine best courses of action.

Figure 2.1

Typical Local Government Operations



Alternative local government operations.

Leadership perspective: Relational practice and bottom-up collaboration. In an alternative local government operational scenario governments have fewer tendencies to operate in a siloed manner, a greater ability to integrate State and Federal mandates with local initiatives, and can gain efficiencies through multi-jurisdictional collaboration. Decision makers are generally better informed of systemic issues and efforts by an empowered staff. In this scenario local governments have identified the need to encourage collaboration and build relationships to increase efficiency and negate the silo effect. One example of the type of strategies that can be used is the creation of Green Teams, which can be implemented in typical settings to create the potential for change, increase efficiency, and give voice to government staff members who have an interest in creating change. Another example is implementation of a mechanism for bottom-up collaboration and strategy development with other jurisdictions.

Organizational system: Collaborative model that cuts across governmental boundaries. Green Teams are usually made up of staff members or managers from each department within a city or county. They can serve to educate directors, managers, and staff about environmental sustainability, increase inter-departmental coordination, and integrate efforts to increase efficiency of policy implementation. They usually meet consistently on a monthly or bi-monthly basis to discuss policy ideas and directives, funding opportunities, and cost saving and efficiency activities.

The inclusion of a mechanism to allow for bottom up multi-city and county collaboration can build trust, foster innovation, and create comprehensive systemic solutions that increase efficiency and effectiveness. This mechanism can influence decisions and actions through initiating and sustaining dialogue between jurisdictions as well as internally between staff,

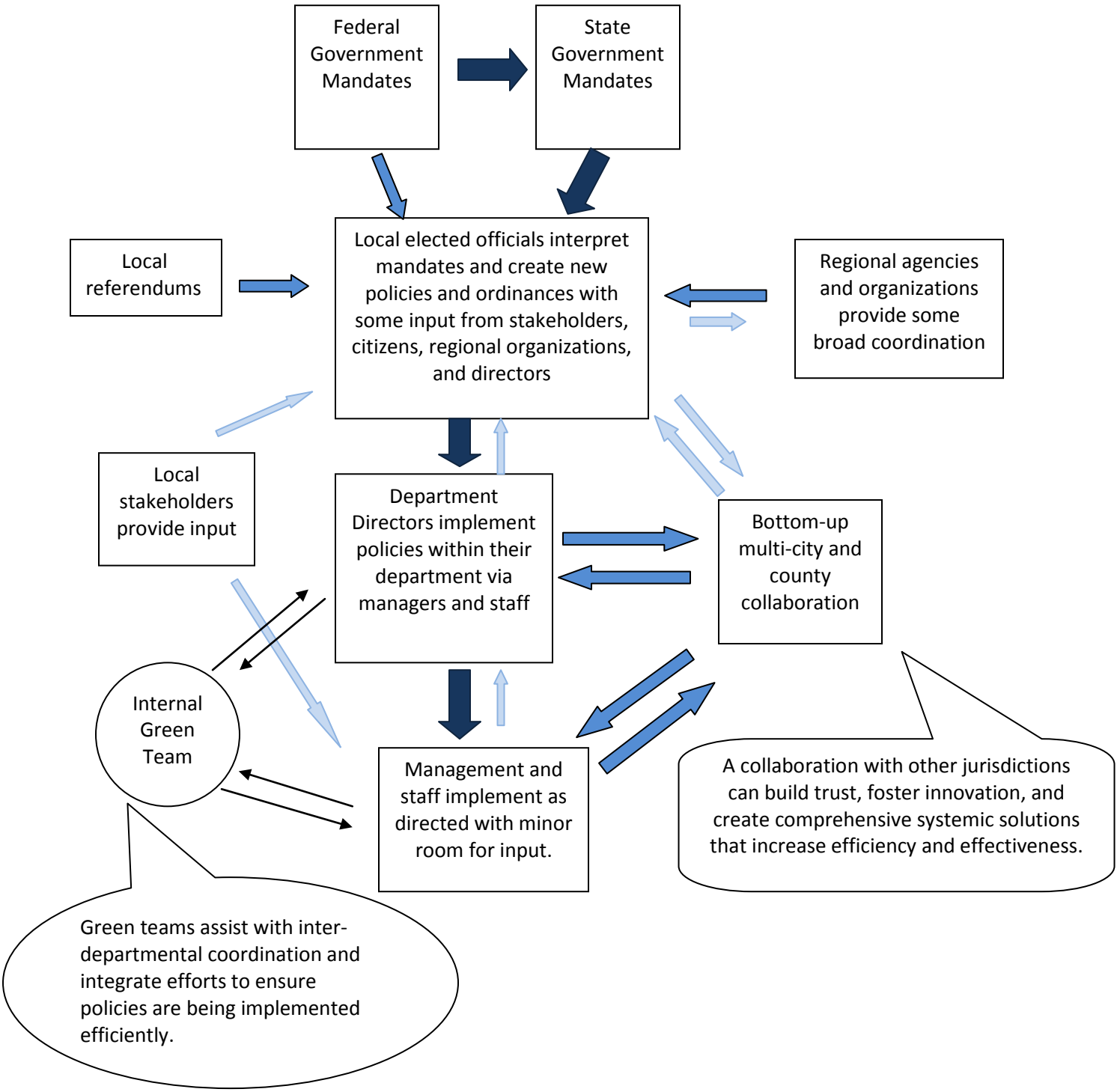
directors, and elected officials. This can give voice to staff members who might provide unique insight and can provide the opportunity for increased risk-taking and innovation. It can also increase empowerment of staff and buy-in of strategies and actions, which could increase likelihood of effective implementation. Bottom-up collaboration is key to increasing momentum and action through coordination and sharing resources and ideas; increasing motivation through distributive power, engagement, and relationship development; and addressing complex systemic issues, such as land use patterns, through a multi-disciplinary approach

Government staff and managers are usually at the frontline of implementing these directives and often have insights and understanding of the issues that the elected officials and sometimes the directors lack. They are also usually concerned with achieving the highest public good through fair and efficient policies. While this is also a priority for most elected officials, there still remains the differential of campaign endorsements and contributions by stakeholders.

Result: Engagement of cities, increased risk-taking, innovation, sharing of resources, increased motivation. Both of these strategies, depicted in Figure 2.2, encourage relationship building, which minimizes siloed approaches and turf battles. Through collaboration and development of relationships, efficiency is increased as a result of integrated strategies and sharing of ideas and resources. This alternative form of governance encourages a more holistic approach to recognizing the complex interdependencies of environmental management and climate change mitigation, increasing level of climate action.

Figure 2.2

Alternative Local Government Operations Encouraging Collaboration



Research Needs and Questions

Local governments have realized great progress over the past decade in addressing climate change mitigation. There is still a great need, however, to further understand the needs of local governments, to address outstanding obstacles, and to further mitigation actions. There is also a particular gap in understanding the role that County governments can play in this arena, which this research has addressed.

King County government is interested in providing a forum to assist its 39 jurisdictions in moving forward on climate change through identifying specific needs of its cities and towns and potential resources it can provide to them. This research project focused on this interest and is discussed in detail in the following chapters. The research questions that are addressed in the case study and the Participatory Action Research project were based largely on this literature review and in collaboration with King County Government.

The case study served to answer the following questions:

- What climate change mitigation actions are currently being undertaken?
- What challenges or obstacles exist in developing and implementing climate change mitigation actions?
- What are the advantages of multi-jurisdictional collaboration?

The Participatory Action Research phase has addressed the following questions:

- What are the primary needs of cities and towns implementing climate mitigation actions?
- In what ways can county governments effectively help address those needs and challenges? What is the most effective role for the county to play?
- On what actions are cities and towns interested in working? Which actions are appropriate for joint cooperation and collaboration?

- What are the best ways to implement these actions? How do multiple jurisdictions effectively collaborate to share resources and expertise in climate change mitigation efforts?
- Is collaboration an effective motivator for change?
- How can commitment be achieved?
- Can an intervention of this type be a good way to catalyze interest and action?

Guiding principles

Based on the literature review, and in collaboration with King County government, the following principles were developed to guide activities during the Participatory Action Research phase. These were reviewed and approved by the local government workgroup assembled for this research.

Principle #1: Each entity has an equal voice in shaping this effort and everyone's participation and input is valued and respected.

Principle #2: This is a collaborative process that can facilitate sharing of information and resources and help achieve economy of scale.

Principle #3: This process is focused on mitigating climate change to achieve economic, human health, and environmental benefits and to promote long-term sustainability locally and globally.

Principle #4: Participation in this effort is open to all King County jurisdictions and to other regional entities working on climate change mitigation. All King County cities and towns are encouraged to participate.

Principle #5: The intent is that this work will result in avoiding, reducing, or sequestering GHG emissions, and that it will influence others to take action and have a multiplier effect.

Chapter III: Questions, Methodology, and Research Procedures

As stated in the introduction and elaborated in Chapter II, this research has sought to answer specific questions relating to the status of existing climate change mitigation actions, needs, and challenges as well as identifying potential future actions and strategies for implementation. The impetus behind this study was a progressive county government and leader in climate change action that wanted to engage and empower its cities and towns within its jurisdiction to increase the level of climate change mitigation activities and consequently reduce emission levels.

In searching the literature for similar studies I was unable to find any research in which a county government sought to engage its cities in this type of effort or to build a network to address these concerns. I assume that other similar efforts are likely happening, but that, like King County, empirical reporting and research has not occurred. In carrying out this study I believe I have added a unique contribution to the literature on climate change mitigation. This study was accomplished in two distinct phases, utilizing two separate types of methodologies: case study and Participatory Action Research; the first phase laying the foundation for the second. The methodology outlined below was developed based on the collaborative and climate action theoretical framework in Chapter II.

Phase 1: Case Study

The first component of this project was to complete a multiple, two-tiered case study of current and planned climate change mitigation actions, and related sustainability efforts within all 39 King County cities and towns. Initial steps included a review of existing documents and websites of each city and town and conducting a telephone survey with each jurisdiction to gather baseline information. Interviews followed with a sub-group of nine cities and towns that demonstrated interest in working with King County to increase climate change mitigation efforts.

These discussions focused on identifying each jurisdiction's needs, challenges, and interests related to climate change mitigation and sustainability efforts.

The case study is both an exploratory strategy as well as a foundational piece for phase two of the research. This descriptive study helped to inform phase two, and also has value as a stand-alone piece by illustrating what is being accomplished region-wide in one of the most progressive regions in the United States in climate change mitigation. The study focuses on understanding the state of climate action in depth and in context with the political and economic climate within each jurisdiction.

Case study methodology. The case study is a common research method and empirical inquiry used in a variety of disciplines that "investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2009, p. 18). It takes a holistic approach and allows researchers to retain the "meaningful characteristic of real-life events…" (Yin, 2009, p. 4).

The case study "permits the grounding of observations and concepts about social action and social structure in natural settings studied at close hand" (Feagin, Orum, & Sjoberg, 1991, p. 6). A good case study is empathic; it seeks to grasp actor's frames of reference and underlying values. "Although planned, its design is emergent, responsive; its issues are emic issues, progressively focused; and its reporting provides vicarious experience" (Stake, 1995, p. 48).

Designing the case study. In designing the case study it is important to consider numerous data sources that can substantiate finding and increase validity of results. To find "validity of data observed" efforts need to "go beyond simple repetition of data gathering to deliberative effort" (Stake, 1995, p. 109). Data need to be triangulated to increase validity of the findings. The case study "relies on multiple sources of evidence, with data needing to converge in a

triangulating fashion" (Yin, 2009, p. 18). It is equally important to develop operative research questions. "Perhaps the most difficult task of the researcher is to design good questions, research questions, that will direct the looking and the thinking enough and not too much" (Stake, 1995, p. 15).

This case study will catalog existing climate change mitigation efforts within King County and will emphasize contextual analysis of activities and their relationships to each other as well as to other variables. I will seek to increase understanding of the effect of participation in networks, the institutionalization of internal green teams, multi-jurisdictional collaboration, bottom-up efforts, and the involvement of senior political champions in the level of climate action.

Research questions and methods. The following research questions were the primary focus of the case study:

1. What climate change mitigation actions are currently being undertaken?
2. What actions are jurisdictions interested in working on?
3. What challenges or obstacles exist in developing and implementing mitigation actions?

Outline of case study. To address these questions and to promote validity of findings through triangulation of findings I took the following steps:

1. Identification of what has worked and been accomplished in King County and what obstacles have been overcome
    1.1. Interview with director of Seattle climate change team
    1.2. Review of literature about Seattle's climate change actions
    1.3. Interview with climate change lead of Puget Sound Clean Air Agency
    1.4. Interview with local ICLEI representative

2. A survey of climate and energy efforts in all King County jurisdictions
    2.1. Review of King County jurisdictions websites to identify general programs.
    2.2. Telephone survey with all King County jurisdictions
    2.3. Select subgroup of jurisdictions for next steps
3. Survey subgroup to identify needs and how the County could help
    3.1. In-person one on one interviews with key people in each jurisdiction in subgroup
    3.2. Identify needs, challenges, and interests

Data analysis. Numerous sources of data were gathered and analyzed to develop a descriptive and heuristic account of the case at hand. During this analysis I utilized multiple sources of data to triangulate and validate findings. To increase validity, following each interview I summarized my notes and had the interviewee review them to make sure I captured their words and thoughts accurately. Following this process I asked the participants in the Participatory Action Research phase to review my summaries to identify any information that does not appear accurate, or to add clarification if needed.

Sources of information. The following sources of information were utilized for the case study analysis:

- City and town websites
- Official jurisdictional documents, such as climate change or sustainability plans
- Responses to telephone survey
- Notes from in-person interviews
- Notes from follow-up phone calls with additional city staff, as identified by interviewees
- Personal reflections from on-going journal

Phase 2: Participatory Action Research

Participatory action research's primary difference from traditional research carried is that individuals directly involved at the local level identify and research the issues in collaboration with a professional researcher and then utilize the results to create positive change. It is "cooperative development and application of social research methods that accomplish both appropriate social change and the generation of new social knowledge for the benefit of all participants" (Cornell, 2007, para. 1).

The most prevalent use of action research today is in the educational realm. John Dewey worked to advance progressive education in the early twentieth century by promoting the active involvement of professional educators in community problem-solving, utilizing Lewin's methods and principles (McTaggert, 1997). There are currently numerous research centers at universities focused on the use of Participatory Action Research in educational settings. "It is often the case that university-based action researchers work with primary and secondary school teachers and students on community projects" (O'Brien, 2001, para. 26).

Taking a more radical approach, in the 1960s, Paulo Freire developed his creation of knowledge and freedom from oppression theories that embraced utilizing Participatory Action Research to bring about not only social change, but social revolution (Bartlett, 2005). Rather than collaborating with those in power, his ideas sometimes promoted an adversarial role with 'the oppressors' (Greenwood & Levin, 2007). There are numerous case studies of Participatory Action Research being used in this capacity in Africa, Asia, Central and South America where power relations are central to the effort (Lykes & Coquillon, 2006). In this domain of Participatory Action Research, the means of knowledge production, and particularly the social

power to determine the validity or usefulness of knowledge, is recognized as a tool used by elite classes to dominate the masses (Rahman, 1985).

Trustworthiness of findings. Creating credible knowledge is at the heart of all scientific inquiry, and so the trustworthiness of findings is imperative to good research. Much debate has ensued over the past few decades as to the validity of findings from Participatory Action Research, with a small contingent in the academic community that still view it as unsystematic and atheoretical. At the same time, the field of Participatory Action Research has proven its value and its acceptance is now fairly widespread (Greenwood & Levin, 2007). The criticism that being immersed in and facilitating a research project decreases the validity of the findings has not proven to hold up under scrutiny. On the contrary, Participatory Action Research is often considered to be more valid than traditional research in that it gives active voice to the individuals most intimately involved in the social issue at hand (Greenwood & Levin, 2007).

Greenwood and Levin (2007) assert that the strategies utilized during action research can provide more meaningful results than conventional social science. It provides inherent accountability through observation, reflection, and feedback loops that continually evaluate the effectiveness and validity of the research. Triangulation is also utilized by using multiple sources of information and methods to cross-check information, and using a diversity of researchers to encompass varying perspectives and disciplinary backgrounds.

Other methods employed include participant checking, peer or colleague checking, and impact on stakeholder's capacity to know and act. Participant checking generally involves reviewing reports with working hypotheses and contextual descriptions both during and at the completion of the process to ensure that the data is captured appropriately. Peer or colleague checking can be accomplished with external periodic review of the reports and process. Finally,

the ultimate test of trustworthiness is to be able to demonstrate that the study has had an impact on the participants' knowledge, empowerment, and ultimate action to create positive social change (Pretty, 1994).

Basic Steps and Components of Participatory Action Research.

Framework. Most Participatory Action Research approaches follow a basic framework.

1. The initial phase usually involves a series of planning actions initiated jointly by a group of researchers and community members. This steering committee is usually comprised of one or multiple researchers and one or several community or organizational members directly involved in the issue. The initial phase includes agreeing on a common understanding of the issue, gathering preliminary data, and developing a research methodology.
2. The second step is generally the action phase where activities such as interviews, workshops, and focus groups are carried out by the researcher(s) and steering committee.
3. Following this is the observation phase where the research team and participants analyze the data generated and identify actual changes.
4. And finally the reflection phase to identify any further refinements or changes that need to be implemented (Kemmis, 1982; Lewin, 1958).

Many Participatory Action Research studies utilize additional feedback loops where the researcher and participants adjust the process based on the observations and reflections, and then run through the steps again. In this way, theories are developed within the practice context itself, and then tested through intervention experiments. At the same time these feedback loops are improving the change effort (Argyris & Schon, 1978).

Participation. Authentic participation is critical to effective Participatory Action Research. According to McTaggart (1997), participants in the research need to have a role in identifying the parameters of the research, collecting and analyzing data, and using the outcomes of the process. They also need to have a commitment "to improve their own work; to collaborate with others engaged in the project to help them improve their work; and to collaborate with others in their own separate institutional and cultural contexts…" (McTaggart, 1997, p. 31).

Collaboration. "The approach is only action research when it is collaborative, though it is important to realize that the action research of the group is achieved through the critically examined action of the individual group members" (Kemmis & McTaggert, 1987, p. 6). Collaborating with others who have a stake in the problem not only develops an interdisciplinary and usually more comprehensive approach to problem solving, but also builds capacity through creating a learning community and long-lasting collective wisdom (Reason & Bradbury, 2008; Senge, 2006).

Why Participatory Action Research in climate change efforts? The dynamics of climate change policy and actions and the significant changes in international and domestic policies in just the past few years have created a tremendous need for current information and analysis. There are numerous methods being utilized and experimented with to understand and inform social and political climate change actions. Participatory action research is noteworthy in this field of research and a growing area of inquiry primarily because of the sense of urgency to create change. Much of the focus of the research that has been conducted appears to be seeking practical insights more than developing theory. As this culture of inquiry matures I think Participatory Action Research will become more prevalent as the tools for understanding and measurement are refined within this relatively new realm of research. At the same time, each

research project and the tools utilized will likely remain somewhat unique as each group or community will be involved in developing and shaping the process.

In the arena of climate change mitigation, the severity, complexity, and urgency of the challenges are extreme, so much so that many jurisdictions and even nations really do not know how to address the systemic changes that are needed. Participatory action researchers are contributing to the body of knowledge that will help our societies address these systemic changes, but they are also addressing the urgent nature of climate change mitigation research by creating change themselves. I think this is a very appropriate method for this type of research.

Existing barriers to climate change mitigation at the local level include the challenge of communicating and translating global climate science into information that is relevant for on the ground local policy decisions and action (Moser & Dilling, 2007). Cohen (2010) asks "Is this a problem of communication, translation, engagement, or have we still failed to cross the disciplinary and cultural divides that influence individual and collective visions of the world around us" (p. 132)? Participatory action research, by its very nature is interdisciplinary and so is a natural fit for addressing this challenge (Herr & Anderson, 2005). Cohen (2010) contends:

> Shared learning with practitioners can lead to new pathways for information exchange between practitioners and the stakeholders who employ them. The act of translation of climate change for practitioners and stakeholders, and the role of tools in linking climate information and practitioner interest, can result in practitioners becoming extension agents for climate change adaptation or mitigation (p. 133).

Effective methods and practices used in Participatory Action Research. There are numerous methods and practices that can be utilized in Participatory Action Research. Table 3.1 highlights some of the most common methods in practice and types of action implemented, drawn from five diverse Participatory Action Research studies focused on climate change mitigation.

Table 3.1

PAR Methods Utilized for Climate Change Mitigation

	Steering Committee/ Task Force/ Focus Group	**Interviews**	**Workshops / Meetings**	**Evaluation : Feedback sessions/ interviews**	**Survey**	**Field Study and/or Monitoring**	**Type of Action**
Okanogan Water Stewardship Council	☑		☑		☑		Development of comprehensive water stewardship plan.
Climate-group initiated legislation in Australia		☑	☑	☑			Social movement campaign. Development of legislative action.
Community focused demand management in Australia			☑	☑		☑	Student curriculum and household engagement.
Campus led GHG action initiative at Penn State University and surrounding community	☑	☑	☑				Campus emissions inventory and development of mitigation strategies.
California State Parks and Climate Change		☑	☑			☑	Funding of climate efforts, recognition of the value of parklands in state offset program.

Participatory action research and climate change mitigation. Efforts to reduce GHG emissions at the local level are occurring in local governments throughout the world, as well as in schools and universities, households, and non-governmental organizations. Researchers are engaging with communities to create change through Participatory Action Research through a

variety of methods, as summarized in Table 3.1 above. The following is a brief description of some of the tools utilized in climate change mitigation and adaptation at the local level.

Water stewardship in British Columbia. In eastern British Columbia in the Okanagan Valley, fruit growers, fisheries managers, and other stakeholders were concerned about the impact of climate change on water resources. In response, the Okanagan Water Stewardship Council participated in an action research project to develop a long-term water management plan that addressed climate change concerns. Some of the participants assisted in designing the study, participating in focus group sessions, and building models. The important finding from this study was the culture of climate change awareness and related action that was created within the community of water practitioners and stakeholders (Cohen, 2010).

An educational approach in Australia. In Australia, household activity contributes approximately one-fifth of the total GHG emissions through energy consumption and waste generation. Consequently, addressing the areas that can be affected by the average citizen has the potential for large impacts. In a recent Participatory Action Research study, an innovative approach was utilized to initiate household emission reduction and engage and educate students and their families. The focus of the study was to test methods of changing attitudes and behavior in regards to living sustainably and reducing families' energy, water, and waste consumption.

The primary researcher engaged students to help implement the program and their families agreed to participate by reducing carbon emissions and auditing their consumption of energy, water, and waste. The families also participated in a workshop, pre and post surveys and interviews, and student and teacher feedback sessions and group discussions. The action research component of this is innovative in that it utilizes the secondary academic institution as both a learning and a teaching platform. The students are learning as they are participating in the study,

and they are assisting in teaching the community through their involvement in the research. Significant findings included the increase of environmental and global warming concerns and a decrease in energy and water consumption (Hancock, 2007).

Linda Hancock's study (2007) focused on this need to reduce consumption through a Participatory Action Research approach. Rather than just studying household behavior, she also sought to change it. As Director of the Corporate Citizenship Research Unit at Deakin University in Australia, she devised an action research study that involved students and their families from five primary and secondary schools and measured changes in consumption patterns as a result of education and community involvement.

Political activism in Australia. Another effort in Australia was an initiative by a political activist group intent on effecting change by initiating legislation on effective policy action. The climate group initiated legislative process encouraged political activism and response and action from politicians. This study tested and further developed the theory of double-loop learning and its applicability to Participatory Action Research (Hall, Taplin, & Goldstein, 2009)

Campus led effort in Pennsylvania. A university led effort that involved Pennsylvania State University and the surrounding county focused on development of collaborative climate change mitigation strategies. It utilized a series of focus groups, interviews, and meetings both on campus and in the community. This process improved collaborative mitigation planning methods and protocol and identified local transferability (Knuth & Nagle, 2007).

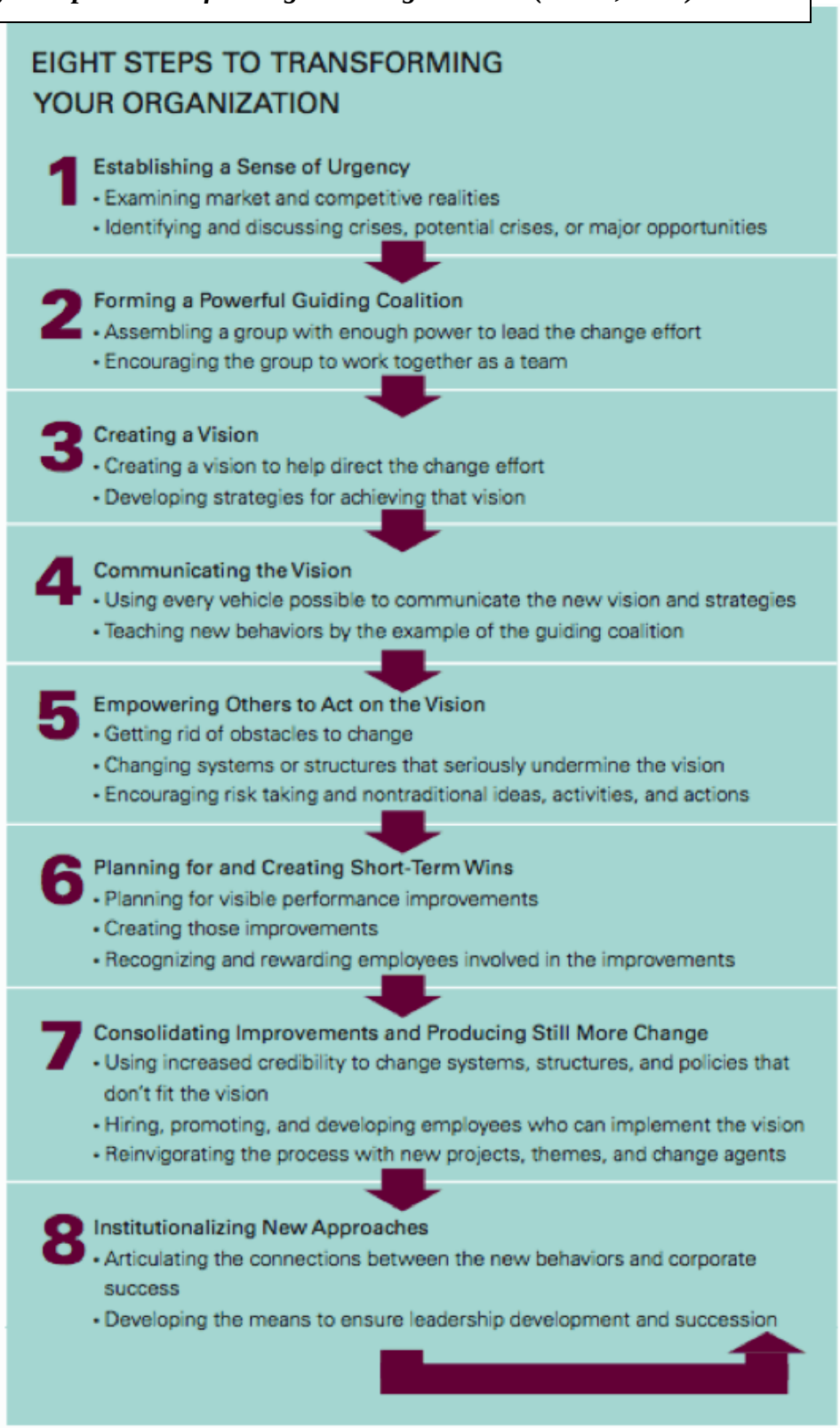
California State Parks. In this study a state parks' commissioner sought to identify needed policies to prepare state parklands for the effects of climate change, and to assess how the California Department of Parks and Recreation could contribute to the mitigation of greenhouse gases through programs, education and outreach, and influencing statewide policies. One of the ultimate goals was to protect the future of the parks.

During my search for examples of local climate change mitigation actions that utilize Participatory Action Research approaches, I only found a few examples, as mentioned above. Some studies not mentioned utilized a component of Participatory Action Research embedded within another primary method. Interestingly, I did not find any that had used Participatory Action Research with local governments developing and implementing climate change mitigation actions. This research will help fill this gap.

Organizational change methodology. Kotter's (2007) organizational change methods combines well with theories of Participatory Action Research (PAR) to explain how social change can occur and be sustained. Figure 3.1 illustrates the eight critical steps he has identified for effective change within organizational structures. Two of these steps are particularly aligned with PAR. Kotter's Steps 2) Building a powerful coalition and 5) Empowering others to act, are successful at encouraging transformative change (Kotter, 2007).

Figure 3.1

Eight Steps to Transforming Your Organization (Kotter, 2007)



.

The Participatory Action Research (PAR) process utilized for this project fits well within the framework of Kotter's eight-step organizational change process. The following illustrates the PAR actions that were chosen for each of the eight steps, except the first one.

1. Sense of Urgency: Participants already had a shared understanding of the urgency of climate change action so this step was not undertaken.
2. Forming Coalition: Form a steering committee representing the primary interests; gain support of the County government to provide legitimacy and resources; make it a completely voluntary process; utilize an outside facilitator without formal authority; and assemble a workgroup of interested participants.
3. Creating a Vision: Have workgroup review and approve the guiding principles that outline the vision to create collaborative process, share resources, mitigate climate change, achieve economic, human health, and environmental benefits, and promote long-term sustainability.
4. Communicating Vision: Communicate vision during workshops.
5. Empowering Others: Give participants voice in a supportive setting and encourage them to share ideas and take ownership of the process.
6. Short-Term Wins: Seek short-term wins.
7. Improvements and Change: Create improvements and change in climate change mitigation.
8. Institutionalizing: To sustain the changes and continue improvements, seek to institutionalize the process.

Research questions and methods. The following research questions were the primary focus of the Participatory Action Research phase:

1. What are the primary needs of cities and towns implementing climate mitigation actions?
2. In what ways can county governments effectively help address those needs and challenges?
3. What is the most effective role for the county to play?
4. On what actions are cities and towns interested in working? Which actions are appropriate for joint cooperation and collaboration?
5. What are the best ways to implement these actions? How do multiple jurisdictions effectively collaborate to share resources and expertise in climate change mitigation efforts?
6. Is collaboration an effective motivator for change?
7. How can commitment be achieved?
8. Can an intervention of this type be a good way to catalyze interest and action?

The research procedure for this phase is detailed below. I developed this approach in collaboration with the King County climate team coordinator. King County has been recognized as a national leader in climate change mitigation. It is again taking a leadership role in trying to identify ways to assist the jurisdictions that lie within the County boundaries to further its own efforts in climate change mitigation.

Both the interviews I conducted and the workshops contained an open dialogue component that is indicative of a democratic society with principles such as freedom of speech. There are numerous societies where this type of research could not be conducted because of the inability of individuals within society, and particularly within government, to freely express themselves without fear of reprimand. In some countries questioning the status quo can carry significant consequences, such as loss of career, loss of freedom, or in extreme situations, loss of life.

For effective Participatory Action Research there needs to be trust and openness. Without freedom of thought or speech, this cannot occur. Democratic dialogue was first formally introduced as the dialogue conference in Norway and then in Sweden. The "conferences were designed to place all participants on an equal footing while at the same time promoting the production of ideas and the ability to reach joint action platforms.

For the first step of this second phase I formed a steering committee with members from King County, ICLEI, and three cities to participate in and guide the process. The steering committee assisted in refining the guiding principles for the research, continual refinement and critique of the research methods, tools, and actions, and initial development of options for consideration by the larger group.

During the case study, a subgroup of nine jurisdictions were selected to participate in the study. This group was self-selected based on willingness and capacity to participate. The steering committee confirmed the selectees to ensure there was cross representation from small, large, rural, and urban jurisdictions, as well from governments that are relatively advanced in climate change action and those that are just beginning efforts. Participatory action research methods were utilized during the proposal formation stage.

This research involved three workshop style meetings and collaborative development of recommendations. During the workshop meetings a third party observer attended, took notes, and critiqued my findings after the process. The recommendations developed from this research focused on how to best increase adoption and implementation of climate change mitigation policies, projects and programs.

Researcher's role as facilitator. This research involves a Participatory Action Research component where I served as the facilitator of the collaborative development of the proposal and

recommendations. l implemented the action research methods in collaboration with King County to develop a mutually agreed outcome, with the process being maintained by King County afterwards. During this process I also served as leader, listener, observer, reporter, planner, and synthesizer. I was not a neutral observer, but was rather immersed in the project and concerned about the results.

As a facilitator during this action research process, I co-created purpose with the people involved in the process. I drew from Jenny Mackewn's guidelines of group development and facilitation during the workshops (Reason & Bradbury, 2008). These guidelines recommended ensuring that all participants felt welcomed, valued, and a part of the community. To achieve this, at the first workshop I greeted each individual personally and allowed time and opportunities for people to get to know each other. I also set the stage by clearly outlining the structure, objectives, and expectations of the meeting.

During the course of the workshops I encouraged expression of different opinions and feelings, allowing norms to develop, and letting conflict surface when needed. At the same time I set clear limits about what was and what was not negotiable. I acknowledged both formal and informal roles that developed and created an atmosphere where feedback was openly given and received. According to Mackewn these steps allow participants to "feel safe and contained and give them an understanding of the purpose of the group" (Reason & Bradbury, 2008, p. 621).

Another key aspect of facilitating this process was to promote cohesiveness, a sense of equality, and understanding of interdependence. I achieved this through challenging existing norms and assumptions and allowing room for creativity and risk taking in problem solving. I also encouraged others to take leadership roles. "Facilitation as action research in the moment is itself a paradoxical form, both a science and an art. It is a science in that it draws on theory and

evidence; it is an art in that it requires precision, attention and timely action" (Reason & Bradbury, 2008, p. 621).

Outline of Participatory Action Research.

1. Identify steering committee with King County, ICLEI, and three cities to develop agendas and advise throughout process
2. Refine guiding principles with steering committee and develop agenda and process
3. Workshop series with the subgroup participants

    3.1. First three-hour workshop

        3.1.1. Present the case study of King County jurisdictions

        3.1.2. Co-present with subgroup representatives findings from cities (actions, challenges, needs, and interests)

        3.1.3. Present and discuss ideas and options for proposal based on findings and successful efforts in other jurisdictions

        3.1.4. Solicit other ideas from participants

        3.1.5. Gauge interest in which ideas to further explore

        3.1.6. Agree on process to further develop recommendations

    3.2. Between workshops evaluate process and develop initial recommendations and next steps with the steering committee, as well as set the agenda for the next workshop.

        3.2.1. Second three-hour workshop

            3.2.1.1. Discuss draft of proposed recommendations

            3.2.1.2. Refine areas of interest

3.2.1.3. Discuss needed changes and edits to proposed recommendations

3.2.1.4. Finalize remaining edits or comments on proposal via email

3.3. Between workshops evaluate process and refine final recommendations and next steps with the steering committee, as well as the agenda for the next workshop.

3.4. Third three-hour workshop

3.4.1.1. Agree on recommendations and next steps

3.5. Seek feedback from steering committee on process and outcomes

4. Follow-up one-on-one interviews with subgroup participants

4.1. Seek reflections on process and outcomes (process going forward, relationships formed, recommendations developed, things learned, etc.)

4.2. Seek critique of researcher's analysis (report of phase one and phase two process)

4.3. Discuss any actions they are taking or planning to take as a result of the process

5. Seek feedback from non-participating peer observer on process and outcomes

6. Seek feedback from King County staff participants on process and outcomes

Data analysis. During the Participatory Action Research phase, I collected information from multiple sources with the intent to triangulate and validate data. This was accomplished by taking careful notes during steering committee meetings and workshops, keeping a journal of personal observations, and using feedback loops with participants, a steering committee, and an external observer. Following each workshop I wrote up the notes and sent them to the participants for their review and feedback, seeking comments, edits, and critique.

After the workshops were completed and the recommendations were approved by the group, I sought additional feedback on the process and outcomes from the sub-group, steering committee, King County staff, and the external observer through an assessment survey. Through the implementation/steering committee that was formed after the planned process, I identified actions the jurisdictions were planning to take as a result of the process.

Sources of information.

- Case study
- Notes from meetings that include discussions and conclusions
- Feedback from non-participating peer observer
- Recommendations developed by group
- Feedback from participants
- Feedback from steering committee
- Feedback from County staff participants
- Personal observations and reflections from journal

Conclusion

I was intrigued by the two primary tenets of Participatory Action Research, taking action to create social change and creating knowledge through research and reflection. I saw these as both a valid method of researching social change, as well as a way to help create change. At the same time, it empowers; it gives voice to those to whom the research is most relevant. Through my work with local government and communities, I have come to recognize the value of local insider's knowledge, motivation, and action. Participatory action research embraces and respects this type of knowledge and everyday practice.

Chapter IV: A Case Study of Local Climate Change Mitigation Activities in King County

Introduction

Climate change is occurring throughout the world. In many places, sea level rise is disrupting entire regions and communities, extreme weather is causing flooding and drought conditions, and glacier melt will affect fresh water supply and hydropower potential (IPCC, 2007). In a few areas, such as Greenland, climate change is being welcomed as ice sheets melt and previous unavailable resources are becoming accessible. From collective accounts, however, the problems associated with climate change on a world-wide scale far outweigh benefits realized. In King County one of the primary concerns is the anticipated decrease in snowpack in the Cascade Mountains and the increase in precipitation, which will impact stream flows and water supplies. Low stream flows during summer and increased flooding events in the winter will likely negatively affect the local economy through impacts to agricultural and hydropower production, forest health, infrastructure and property, and salmon and other wildlife.

The IPCC has concluded that it is almost certain that the significant increase in greenhouse gas (GHG) emissions from human activity have "exerted a substantial warming influence on climate" (IPCC, 2007, para. 3). The global increases in GHGs are due primarily to fossil fuel use, land use change, and agriculture. The leading cause of greenhouse gas (GHG) emissions in King County is transportation, contributing nearly half of total emissions. In 2002, the King County region contributed approximately 23 million metric tons of carbon dioxide to the atmosphere annually (King County, 2001). Electricity consumption accounts for 19%, large industrial sources 13%, fossil fuels burned by households and small industries another 15%, and agriculture and landfills about 4% (PSCAA, 2007). Emissions from electricity generation in King County is significantly lower than most parts of the US due to the availability of

hydropower, which is a renewable and carbon-free source of energy. In other parts of the country and the world, coal-fired power plants are the primary energy source and the largest carbon source as well.

Background. Climate change mitigation activities are occurring throughout the globe. Some countries have embraced the call to reduce greenhouse gas emissions and stop climate change. The U.S. is not one of them. Some state and local governments, however, have stepped up to the plate and are showing tremendous leadership and commitment to addressing the need to reduce emissions. The State of Washington has helped to influence needed changes by passing a law that requires a reduction in overall emissions of GHGs in the state to 1990 levels by 2020; 25 percent below 1990 levels by 2035; and 50 percent below 1990 levels by 2050. Several local governments within Washington State are independently and collaboratively taking the lead to meet or exceed these targets. This story is about them.

Encompassing 2000 square miles and 39 cities and towns, King County is home to 1.9 million people. King County is largely a politically progressive county set in an area of abundant natural resources, incredible beauty, and a relatively healthy and diverse economy. It has a history of collaboration and environmental stewardship. Voters have consistently approved land preservation activities, such as passing the King County Farmlands Preservation Bond issue in 1979 and funding a major open space bond issue in 1989 to protect recreation and resource lands. In 1984, the County passed the first comprehensive plan in the state to provide for the protection and conservation of critical habitats, open spaces and resource lands and to establish Urban Growth Boundaries to preserve rural areas. This activity occurred ahead of Washington State's adoption of the Growth Management Act in 1990.

The proactive environmental legacy in King County is attributable to the people who live there and to the leaders they have elected. The County's leadership role in environmental stewardship is fostered by a well educated community. Forty percent of the population over the age of 25 hold college degrees compared with the national and state average of twenty-seven percent. In addition, there is a wealth of expertise in green technology, including green building, energy efficiency, and alternative transportation options.

King County's economy is also relatively healthy with the median household income at $70,000 a year compared with the national annual average of $45,000 (US Census Bureau, 2009). The largest industries and employers in the region are information publishing; healthcare and social assistance; professional, scientific, and technical services; management of companies and enterprises; manufacturing; finance and insurance; construction; and retail trade.

There is a broad diversity of communities within the region, ranging from rural towns of a few hundred people to highly urbanized cities of several hundred thousand. This case study will illustrate some of the similarities and differences within these communities in climate change mitigation actions being considered and implemented and will depict some generalized characteristics of the region as a whole.

This case study is a multi-faceted investigation of government led climate change mitigation activities in King County and its 39 cities and towns. The purpose of this case study is three-fold. The first is to provide King County and its local governments a better understanding of what is going on within their region. It contributes to a broad understanding of where the region is collectively – what actions are currently being undertaken and where the gaps are – and will help inform choices for next steps in climate change mitigation. The second is to increase understanding of variables on level of activity by discussing potential relationships between

activities and participation in networks, utilization of green teams, collaborative efforts and the role of political champions. The third is to provide jurisdictions in other areas an example of what can be achieved locally with or without mandated state and national climate change mitigation legislation.

Case study questions. This material and analysis provided seeks to answer the following questions that pertain to King County and its cities and towns.

- What climate change mitigation actions are currently being undertaken?
- What challenges or obstacles exist in developing and implementing climate change mitigation actions?
- What are the advantages of multi-jurisdictional collaboration?

Methodology

The focus of this study is on the geographic region within the boundaries of King County, inclusive of all 39 cities and towns. This collective and instrumental case study was conducted over a four month period from August through November 2010. Information was gathered through a variety of means. The primary sources of data collected include a telephone survey and in-person interviews with local government staff, review of website materials, and official city and county government public documents. To initiate the process, I approached King County in June 2010 to identify shared interests in forming a collaborative relationship to address climate change mitigation. In coordination with a representative from King County and a representative from ICLEI, we jointly developed the telephone survey to obtain information from all King County cities and towns about climate change mitigation and related sustainability activities.

I conducted the survey by telephone with 33 of the 39 cities. Respondents were chosen through a variety of means. Contact information for the cities that were members of Cities for

Climate Protection was provided by ICLEI – Local Governments for Sustainability. Other respondents, ranging from associate planners to elected officials, were chosen based on their position, knowledge of sustainability planning activities occurring in their jurisdiction, and willingness to participate. Each survey took anywhere from 15 minutes to an hour. About half of the respondents were enthusiastic about conducting the survey. These respondents were typically from cities that were actively promoting sustainability strategies and the survey sessions generally lasted at least half an hour. A few cities appeared disinterested and expressed concern with the amount of time needed to conduct a survey. These respondents were typically from cities that did not place sustainability measures as a high priority and the survey sessions were in the 15 to 20 minute range.

In addition to the survey, in person interviews were conducted with nine of the cities to gain a better understanding of their perceived challenges and needs. The information gathered from cities through the survey was triangulated with local and regional documents and websites. A review was conducted of cities' comprehensive master plans, climate action plans, sustainability strategies, energy plans, education and outreach materials, and websites. Additional materials were also reviewed from regional organizations and programs that interact and/or support local government climate action efforts. I discovered numerous discrepancies between the survey responses, official documents, and websites. When this occurred I called the survey respondent to clarify the discrepancy and gathered additional information to gain an accurate perspective. Each respondent was also asked to review the city information and data prior to inclusion in the case study. The city profiles for the twelve cities with the highest levels of activity are provided in Appendix A.

The information gathered will inform a second phase of research. Phase two is a Participatory Action Research project with King County and nine cities. The purpose of this project is to collaboratively develop proposed recommendations for how King County and its cities and towns could collaborate to make progress on climate solutions. This effort's process and findings are detailed in Chapter V.

King County Climate Change Mitigation Actions

King County has set targets and goals to stop the increase in countywide greenhouse gas emissions by 2010 and to collaborate regionally to reduce countywide emissions by at least 80 percent below 2007 emissions by 2050. One of the leaders in this effort was former County Executive Ron Sims. "First we must immediately stop the growth of greenhouse gases. Then we must lay out specific achievable goals for the region" Sims proclaimed in a speech to his constituents (King County, 2007c). In 1988, then Councilmember Sims proposed to establish a county office of global warming. This effort was met with resistance, but he continued his efforts and as County Executive he led the County in conducting GHG inventories, joining ICLEI's Local Government and the Chicago Climate Exchange, developing King County's 2007 Climate Plan, transitioning the Metro bus fleet into the largest hybrid biodiesel fleet in North America, preserving major amounts of forest land, and laying the groundwork for the commercialization of electric vehicle technology.

In the 2007 plan, the County outlines areas of operational emissions and a plan of action for reduction. The operational emissions, for which King County is directly responsible, are from transit buses, county and employee vehicles, landfills, wastewater treatment, and county facility electricity usage. The plan also identifies actions the County is committed to taking to influence emission reduction activities in the King County region, Washington State and the United States.

In all of these areas, the strategic focus is to address greenhouse gas accountability and limits; climate-friendly transportation choices; clean fuels, clean energy and energy efficiency; land use, building design and materials (King County, 2007b).

In addition to local efforts, Sims reached out to other local governments and in 2005 brought together over 700 representatives from local governments across the country to jointly address the impacts of climate change. The widely acclaimed conference called “The future ain’t what is used to be” sparked “great enthusiasm for additional knowledge, collaborative strategies, and shared resources…” (King County, 2007a, p. 10). In response to the flood of requests that King County received following the conference, it developed, in collaboration with the University of Washington Climate Impacts Group and ICLEI – Local Governments for Sustainability, a guidebook to assist local, regional, and state governments in preparing for climate change (King County, 2007a).

Another notable leader and effort in the region is former Seattle Mayor Greg Nickels’ founding of the U.S. Conference of Mayors' Climate Protection Agreement in 2005. One of the most successful efforts in the US in local climate action, the agreement now has 1044 mayors’ signatures vowing to reduce carbon emissions in their cities in line with the goals of the Kyoto Protocol (USCM, 2009b). The U.S. Conference of Mayors Climate Protection Center is supporting and expanding this effort. Climate Solutions, the most highly visible climate action NGO in the Pacific Northwest, promotes a successful climate action agenda through energy and transportation solutions that mitigate greenhouse gases while benefiting the regional economy. They support local and state government efforts and they partnered with the City of Seattle to launch the US Mayors Climate Protection Agreement.

Today, new leaders have taken up the charge. King County Executive Director, Dow Constantine, is leading the county-wide Growth Management Planning Council to develop regional solutions and policies that will achieve much greater progress through improved coordination and collaboration and increased economy of scale. Constantine also shepherded the recently adopted King County Energy Plan that will decrease use of fossil fuels, increase production of renewable energy, and increase energy efficiency. The current Seattle Mayor, Mike McGinn is supporting a multimillion dollar energy efficiency building retrofit program funded by the Department of Energy. The focus of the Community Power Works program is to achieve energy savings and create green jobs through retrofitting homes, commercial buildings, and municipal facilities.

Each year the King County Climate Report is issued which details progress made from the previous year and plans for the coming year for leadership and emission reduction (King County, 2010c). In 2009, King County helped create and lead the New Energy Solutions consortium focused on developing a regional clean energy economy. It also converted 3,000 traffic signals to Light Emitting Diodes, saving electricity and $112,000 per year; increased the percentage of hybrid vehicles in the county's fleet; and led planning for the electric vehicle project. It is in process of initiating a new method of quantifying community greenhouse gas emissions that is a consumption-based approach rather than strictly a geographically-based approach. It will continue working toward King County's adopted goal of reducing greenhouse gas emissions 80 percent below 2007 levels by 2050, focusing on programs that save money, create new revenue streams, or lead to the creation of new green jobs for the region (King County, 2010c).

The Puget Sound Clean Air Agency has facilitated and supported numerous emission reduction activities in King County. Accomplishments include developing the *Roadmap for*

Climate Protection: Reducing Greenhouse Gas Emissions in Puget Sound, which lays out near-term recommendations to achieve significant emission reductions by 2020 while achieving economic gain (PSCAA, 2004). Led by Dennis McLerran, the former Executive Director, the Agency negotiated agreements with all the local refineries to switch to low sulphur gasoline and implemented several award winning programs such as Diesel Solutions, a voluntary diesel retrofit program; the summer clean gasoline program; the Clean School Bus program; and the Evergreen Fleet Standard.

Through strong leadership and a stewardship minded constituency, King County is making progress. It has instituted numerous regulations, policies, and programs focused on reducing greenhouse gas emissions including land use policies that reduce urban sprawl and preserve forests and open space and a state of the art sustainable development program. Through its numerous efforts it is providing a model for other jurisdictions and support for its cities and towns. In addition, several of the cities are frontrunners as well. The following sections illustrate some of the widespread strategies and programs underway.

Key findings of case study.

Influential variables. The success achieved by King County and its cities and towns in addressing climate change has been influenced by numerous factors. I have outlined the most prominent factors below:

- Strong and strategic leadership from champions such as Former County Executive Ron Sims and Former Seattle Mayor Greg Nickels kept the ideas alive and set the stage for change. Dennis McClerran, former Director of the Puget Sound Clean Air Agency, also played a significant role, as has the current County Executive Dow Constantine. Strong leadership in other cities is also influencing positive changes.

- A supportive, highly educated, and environmentally conscientious constituency that values healthy living has repeatedly elected public figures who are adopting sustainable policy choices, funding and supporting climate action programs, and taking action.
- A healthy and growing regional economy contributes resources and a sense of well being that allows citizens and leaders the flexibility to focus on environmental concerns.
- The Governor and state legislature are adopting goals and legislation that supports climate change mitigation, such as requirements for increased energy efficiency, electric vehicle infrastructure, and reduction in vehicle miles travelled.
- There is a strong relationship between municipalities that have internal green teams and level of climate change mitigation activity across the board. I would posit that the institutionalization of green teams within a local government embodies a sustainability mission and serves to implement overarching policy, encourage collaboration amongst departments, and increase level of activity.

Progress. Significant progress is being made in the following areas:

- King County is providing strong leadership for climate action and is taking a fairly aggressive approach to implement mitigation activities through numerous efforts such as its county-wide greenhouse house gas inventory and emission reduction goals.
- Several jurisdictions are implementing energy efficiency measures that are realizing cost savings as well as reducing GHG emissions.
- Electric vehicle infrastructure is taking off in Washington, and particularly King County, and holds promise to be a viable alternative to fossil fuel dependent vehicles.

- There is strong support from Washington State Legislation for greenhouse gas reduction goals, commute trip reduction, energy efficiency, and electric vehicle infrastructure.
- The trend for green building is growing and there is a wealth of expertise available.
- Variable tolling is being implemented in coordination with increased bus service, as a disincentive for single occupancy vehicle use for commuting in highly congested areas.
- King County has developed the world's largest digester gas fuel cell that generates renewable energy from waste products.
- All King County cities and towns waste collection services provide recycling services and most provide food composting services.

Needs and challenges.

- Current and future efforts need to focus on changing traffic patterns through land use zoning and promoting mass transit. To achieve success full involvement and collaboration is needed with the Puget Sound Clean Air Agency, the Puget Sound Regional Council, and local governments.
- Most federal funds for transportation are for roads and not for creation of mass transit options. Changes need to be made at the federal level to support local efforts.
- There appears to be insufficient climate change mitigation outreach and education in most jurisdictions. There are still numerous decision makers who question the significance of climate change and who are not taking action.
- There is a need to develop usable and reliable performance measures to assist program development and prioritization of resource allocation.
- Even though several jurisdictions have sustainability policies within their comprehensive plans that support climate change mitigation, more than half of the staff who completed

the survey were not aware of these policies. While I did not conduct an in depth review of degree of implementation of comprehensive plans, from the survey response I construed that only about half of the policies outlined in the comprehensive plans were actually being implemented.

Climate action governance. As illustrated in the following sections there are numerous climate change mitigation activities occurring at multiple government levels. Local governments are part of a complex system of multi-level governance that interacts with networks involving both public and private actors that cut across these levels. The focus of this case study is primarily activities occurring within local government, although a few relevant relationships with other actors are identified, such as those with state government, the Puget Sound Regional Council, and the Puget Sound Clean Air Agency.

Relationship of King County to the cities and towns. King County is a first-tier geographic division of the state. Much of its governance structure is similar to cities and towns, except that it is larger and more complex and has additional regional responsibilities. All 39 counties within Washington State carry out administrative functions for the state, such as maintaining records, assessing property and collecting taxes, and conducting elections. King County is responsible for providing other regional services as well such as transit, waste water treatment, parks, trails, open space, emergency management, and flood control. It is also the regional lead for salmon recovery.

King County's role in the realm of climate change mitigation is broad and varied. King County is required by state mandate to designate Urban Growth Areas (UGAs) and develop King County Countywide Planning Policies (CPPs). This has far reaching implications for land use, housing, and – importantly for climate action – transportation. In 2005, King County conducted a

study of how specific land use and transportation actions could improve air quality, traffic congestion, and public health. This has influenced the County's efforts to develop walkable neighborhoods in collaboration with other government agencies and jurisdictions. "As part of this plan, King County is expanding the regional trail network and introducing performance based zoning. Examples of future projects may include pedestrian and bicycle facilities, a greater mix of land uses within developments, walking maps, safe-routes-to-schools, and regional trails" (King County, 2010c). Through the leadership of its elected officials King County has undertaken efforts to support other local governments in taking climate action, both locally and nationally.

Climate change mitigation activity. To measure level of activity in each jurisdiction I devised a measuring mechanism for each category that ranges from 0-5, with 0 being no activity and 5 being a level of activity that if continued would result in a sustainable outcome. For instance, in the category of "Climate Change Action Plan" a jurisdiction would get a 0 if they were not even discussing developing a climate action plan, a 1 if it had been discussed at all within one of their government departments, a 2 if the elected officials were considering it, a 3 if they were developing it, a 4 if they had adopted it, and a 5 if it was comprehensive and they were fully implementing it.

Based on survey responses and information gathered, I assigned a number to each jurisdiction's level of climate change mitigation activity in each category. Figure 4.1 illustrates the average level of activity for all jurisdictions combined per category measured. The good news is there is activity in all categories. Waste reduction is at the top of the list likely because a huge local social marketing campaign informed the general public about the lack of landfill capacity and the urgent need to address this issue. It also has the benefit of a worldwide

campaign to recycle materials. Renewable energy is at the bottom likely because of the abundant relatively inexpensive hydropower availability.

One interesting comparison to note is the higher activity level of Comprehensive Plan/Sustainability Strategy than the Sustainability Coordination. Several jurisdictions have adopted sustainability policies within their comprehensive plans and/or overarching sustainability strategies. Not all of these policies or strategies, however, are being fully implemented by some type of coordination team or office. Another interesting comparison is the lower activity level for energy efficiency than other activities. Jurisdictions that are implementing energy efficiency measures are finding significant cost savings. I would anticipate that over the next five years this category will move up on this scale.

Figure 4.1

Average Level of Activity per Category

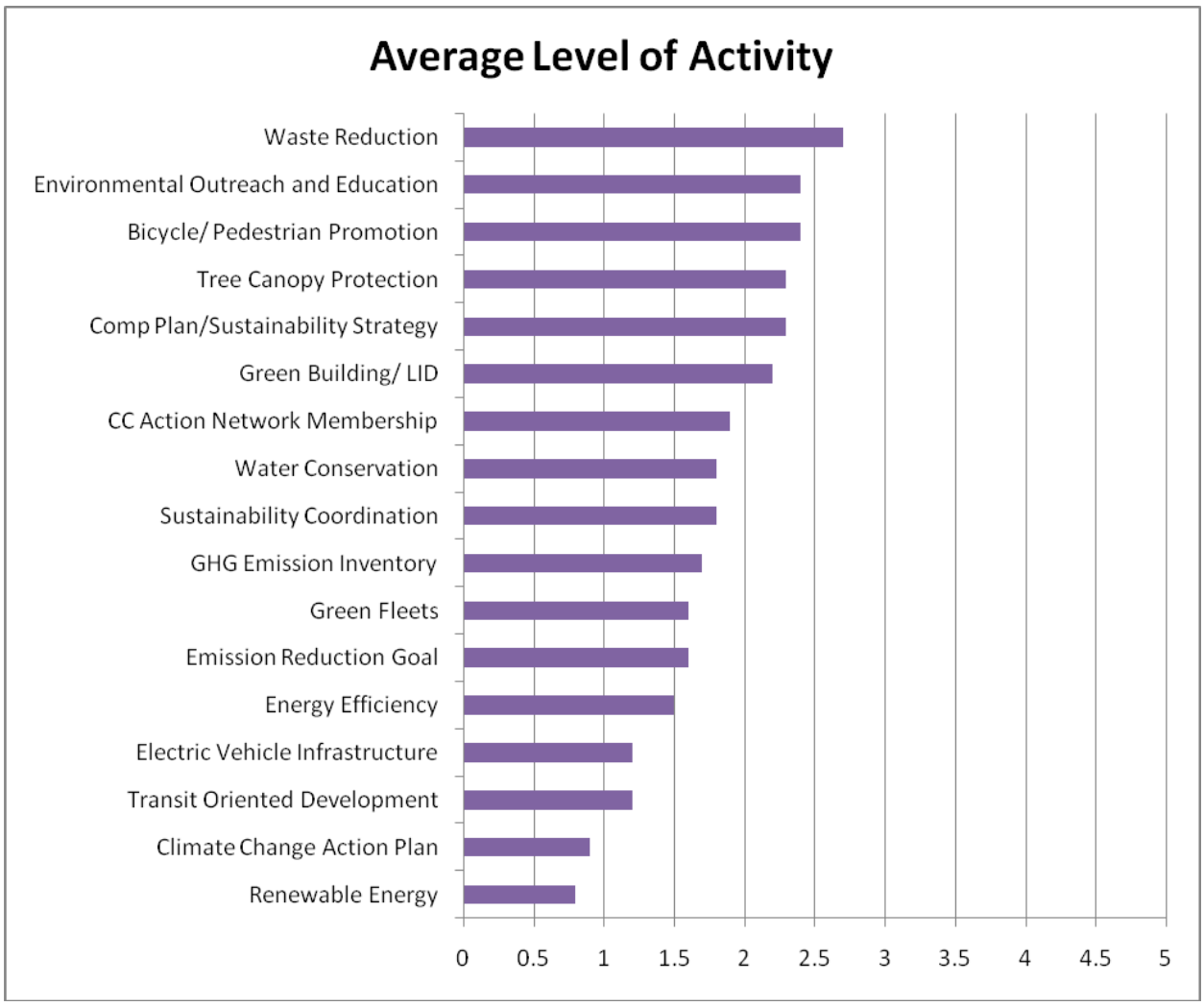


Figure 4.2 shows an overall picture of the level of activity in 33 of King County's cities and towns compared with population. There is some relationship between level of activity and population numbers, but level of activity is not dependent on population. Figure 4.3 shows average level of activity of King County and the 33 cities that responded to the survey compared with median income. Figure 4.4compares level of activity with real estate value for the 33 respondent cities. Neither median income nor real estate value shows any strong relationship with level of activity.

Figure 4.2

Level of Activity and Population

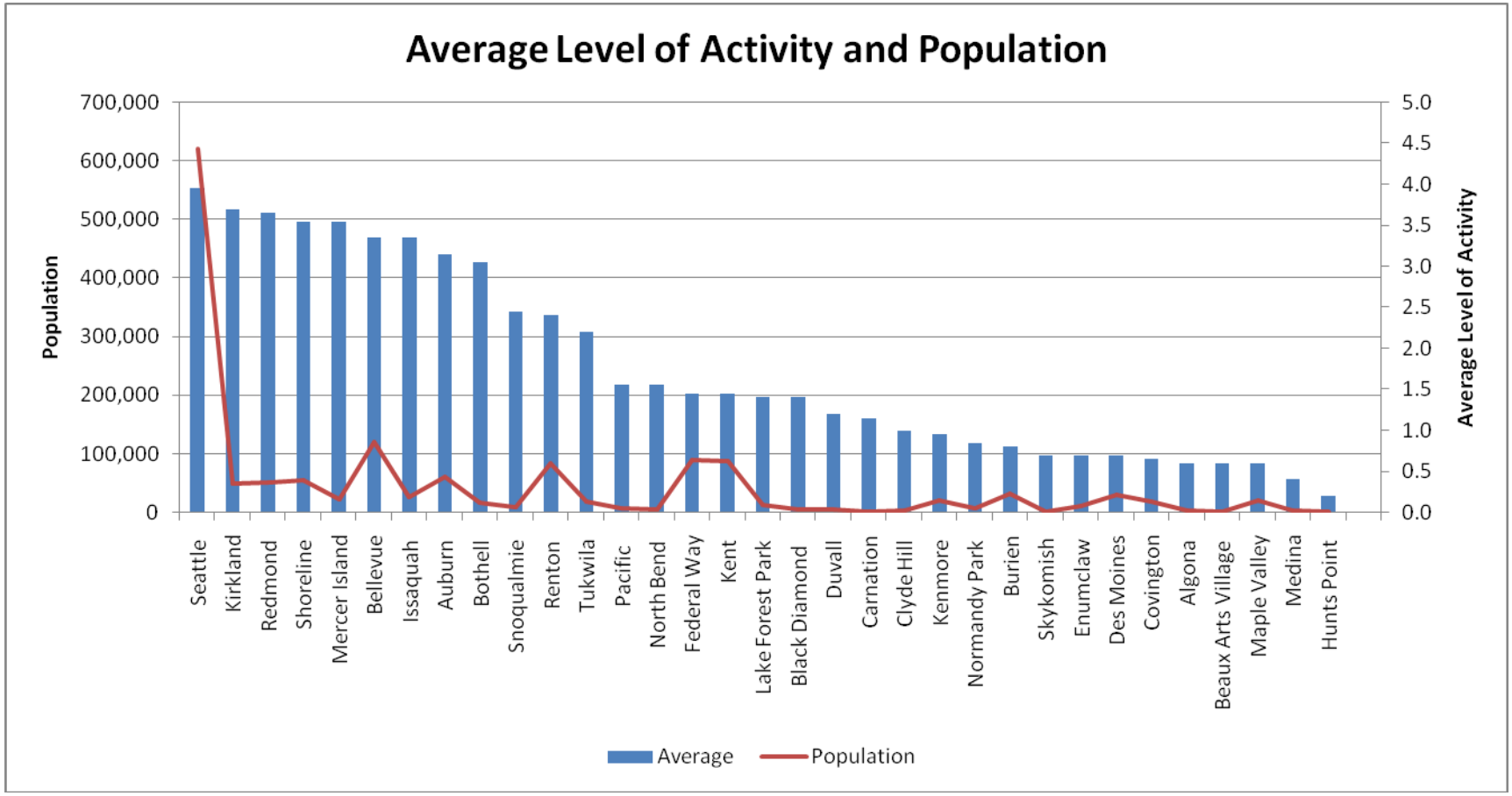


Figure 4.3

Level of Activity and Median Income

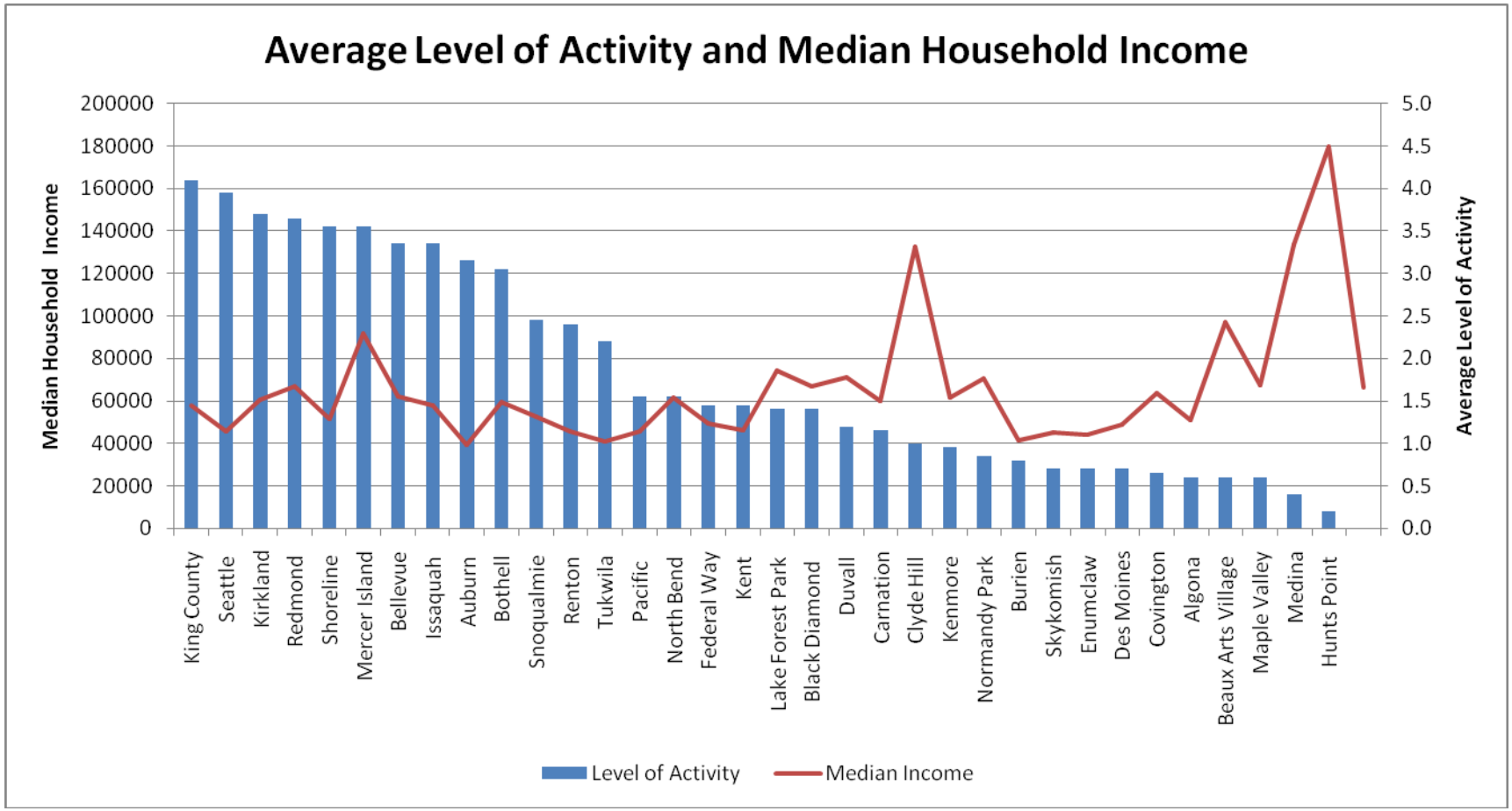
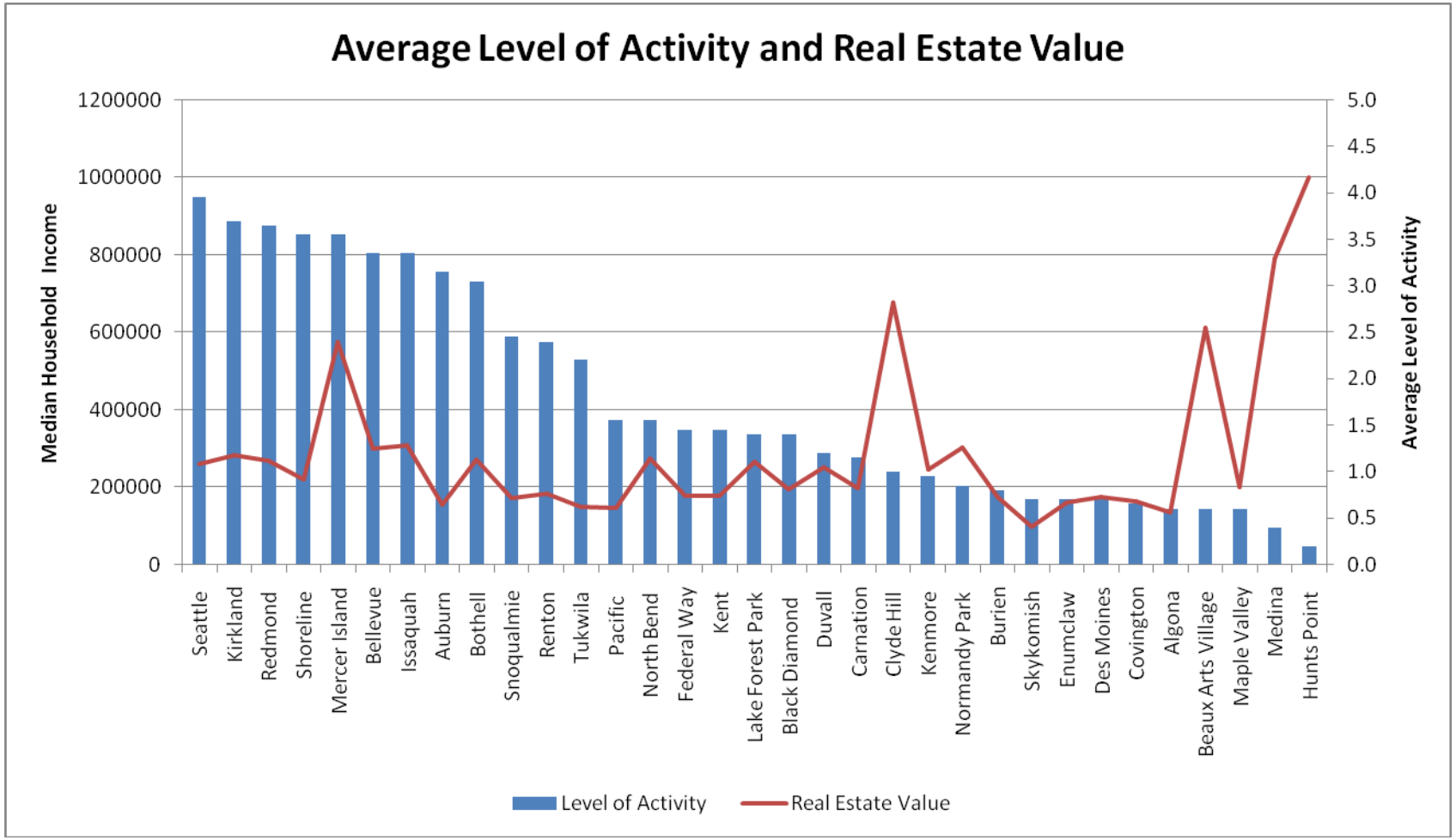


Figure 4.4

Level of Activity and Real Estate Value



Transportation and land use planning. Washington State experienced significant population growth in the 1970s and 80s and many people sought homes in the quieter and usually more affordable areas outside of the cities. This urban sprawl increased dependence on personal vehicles and consequent use of fossil fuel. It also contributed to loss of tree canopy and habitat and an increase in cost of infrastructure. King County's adoption of the Urban Growth Boundaries in 1984 and the Washington State Legislature's adoption of the Growth Management Act in 1990 began to address these concerns by requiring comprehensive and strategic planning for land use and transportation to control sprawl and decrease vehicle miles travelled (VMT).

Transportation contributes nearly half of all GHG emissions in King County and energy use from transportation grew seventeen percent from 1996 to 2005. Consequently, there is significant effort in this sector to reduce use of carbon based fuel, dependency on single occupant vehicle, and length of commute. Reducing emissions from cars has the added immediate and local benefit of improving air quality and the health of King County's residents. King County and several cities are focusing on transitioning to electric and hybrid fleets, encouraging transit use for commuters, and focusing development in transit oriented centers.

As in many urban centers, much of King County's transportation infrastructure was built decades ago without environmental sustainability in mind. The solutions identified today need to work within the confines of existing freeways and developments. One of the disincentives to encourage people to reduce vehicle miles driven, developed jointly by the Washington State Department of Transportation, the Puget Sound Regional Council, and King County, is variable tolling. Tolls will be collected on one of the highly congested bridges across Lake Washington and will be higher during peak travel hours. The funds collected will help pay to replace the bridge. When the tolling begins, 45 new buses are planned to encourage and allow for new

riders. The County has also received voter approval to increase Metro Transit bus service 15 to 20 percent in high use corridors and expanding residential areas. New hybrid-electric buses are being added to the fleet to accommodate this expansion and to replace aging buses.

One of the significant challenges that local governments are facing in the transportation realm is the unavailability of funds to create mass transit options. The funding available is primarily for road construction, which enables continued use of the automobile and contributes to an increasing number of vehicle miles travelled (Stanton, 2010).

The following sections provide additional detail on some of the most significant efforts underway in the King County region to address transportation emissions. These include the deployment of electric vehicle infrastructure, municipal transition to green fleets, and efforts to reduce vehicle miles travelled through commute trip reduction programs and transit oriented development.

Electric vehicle infrastructure.

Importance: Vehicle electrification can help decrease carbon emissions, as well as increase energy security. Electric vehicles (EVs) do not produce primary GHG emissions and will replace vehicles that run on fossil fuel. They are an important component of moving to a clean energy economy.

Activities: The explosion of electric vehicle infrastructure (EVI) is one of the most exciting and unique characteristics of emission reduction activities occurring in King County. The Puget Sound region is participating in the "largest deployment of electric vehicles and charging infrastructure in history" (Ecotality, 2010, para. 1). King County views "new electric vehicle technology as the key to energy efficient transportation for the coming decade" (King County,

2010b). Numerous factors have contributed to this effort including state legislation, federal funding opportunities, and support from The EV Project run by Ecotality.

Washington state code requires that charging outlets for electric vehicles be installed in all of the state's fleet parking and maintenance facilities, and that charging outlets and battery exchange stations be installed in all state-operated highway rest stops (RCW 47.38.075). The intent of this law is to increase consumer acceptance of electric vehicles by initiating the development of convenient infrastructure to support their use. In addition, state code also requires the Washington State Department of Commerce to develop and distribute model ordinances and guidance to local governments for siting and installing electric vehicle infrastructure. The Department of Commerce has also identified a need for consistency in the installation of EVI to enable quicker transition to electric vehicle use (Washington State DOC, 2010). The Puget Sound Regional Council (PSRC) is worked closely with the state and local governments to coordinate efforts, leverage existing projects, and locate infrastructure.

Ecotality received a $100 million grant from the US Department of Energy to deploy electric vehicles and approximately 15,000 charging stations in five states. The company is also planning to install 900 stations at private residences for owners of Nissan Leafs, in coordination with Nissan. In the August 2010 American Recovery and Reinvestment Act (ARRA) Innovation Report, Ecotality and The EV Project are provided as an "example of federal ARRA funding stimulating investment from the private sector and other levels of government to build dynamic infrastructure, support renewable energy adoption and spark job creation" (EV Project, 2010).

"Substituting electricity for gasoline in our cars is one of the most promising ways we can reduce our dangerous overreliance on foreign oil and lower driving costs," said Senator Maria Cantwell (Coulomb Technologies, 2010). A recently approved $7,500 tax credit for plug-in

electric vehicles will provide a cost incentive for buyers. There are also Smart Phone applications that identify unoccupied stations and provide navigation to them. In addition, strategic infrastructure investments will contribute to a clean energy economy.

Regional Status: Local governments within King County have embraced the shift to EVs and are contributing to development of an EVI network. King County is planning to install 200 charging stations at park-and-rides and motor pool lots. The City of Bellevue is planning to install 25-30 stations, the City of Seattle 26 stations, and the Cities of Issaquah and Mercer Island are planning 10 stations each. The Cities of Renton, Sammamish, and Redmond are also planning on installations in 2011. In addition to these cities, several others are interested and in early planning stages for EVI installation. All together, Ecotality estimates approximately 1,200 public stations will be installed in the central Puget Sound region in high traffic areas in 2011. "These efforts are expected to transform the Seattle metropolitan area into a nationwide hub for green vehicle technology" (King County, 2010a).

Implementation Challenges: The biggest challenges remaining in transitioning to electric vehicles are providing an adequate distribution of charging stations throughout the region and developing consumer confidence in electric only vehicles.

Municipal green fleets.

Importance: Municipal Green Fleets reduce GHG emissions and provide successful examples for the general public.

Activities: The Evergreen Fleet Initiative was initiated in King County in 2007 when King County and 21 Puget Sound cities and municipalities collaborated to develop the Evergreen Fleet Standard. It is open to public and private organizations and is the first program of its kind to provide a voluntary green certification. The program launched in 2009 through a partnership

with the Puget Sound Clean Air Agency and the Puget Sound Clean Cities Coalition. The program supports fleet owners in voluntarily adopting strategies that reduce greenhouse gas emissions and encourage use of alternative fuels such as natural gas, biodiesel, and electricity. A recently passed Washington State Law (RCW 43.19.648) requires that all state agencies and local government subdivisions of the state satisfy one hundred percent of their fuel usage for operating publicly owned vehicles from electricity or biofuel by 2015.

Regional Status: King County is a member as well as three other counties, four state agencies, and twenty-one cities, eleven of which are in King County. These Cities include Bellevue, Bothell, Federal Way, Issaquah, Kent, Kirkland, Mercer Island, North Bend, Renton, Seattle, and Snoqualmie. The list of participants in the program is likely to grow as supporting legislation comes into effect and as EVI continues to expand.

Implementation Challenges: A current challenge especially for smaller jurisdictions is limited budgets for expenditure of higher priced alternative vehicles.

Commute trip reduction.

Importance: Reducing vehicle miles travelled is one of the best ways to reduce GHG emissions.

Activities: Washington State instituted a Commute Trip Reduction (CTR) program in a partnership with state and local governments, major employers and other agencies in 1991 to reduce air pollution, minimize energy consumption and congestion. It required the largest employers to provide commute alternatives. This was updated in 2006 and became the CTR Efficiency Act, which now has specific goals that require each jurisdiction to decrease single occupancy vehicle rates 10 percent and vehicle miles traveled 13 percent by 2012.

In response to this, cities are actively pursuing multiple programs to meet these goals. Most cities are providing free or reduced cost transit passes for employees. Free shuttles or buses are also provided in Auburn, Issaquah, Kent, Mercer Island, Renton, and Seattle from transit centers to major work centers or high traffic areas. Bellevue, Kirkland, and Shoreline are working to develop lightrail stations and other cities are actively developing sub-area plans around existing or planned lightrail stations.

Only a couple of cities have utilized disincentives, such as high parking rates. A few jurisdictions are offering a flexible work schedule with more hours on fewer days and some are investigating telecommuting options. Redmond has developed R-TRIP, an online program where commuters can record trips, earn incentives and rewards, track CO2 savings, and access commute resources. Incentives include a $50 gift card and drawing for monthly prizes, vanpool subsidies, and a free one-month bus pass. Approximately half the King County cities and towns are planning or implementing some type of comprehensive bike and pedestrian master plan to encourage biking and walking.

Regional Status: With the new state mandate there will likely be increased activity in this area in the next year. There are several successful examples within the region that can be replicated and expanded.

Implementation Challenges: Cities do not have decision-making authority as to where to locate light rail stations. One city complained that the planned station in their city is not in an optimal location. Another city is concerned that the planned corridor runs right through high quality wetlands. Even with these challenges, lightrail is a clean and efficient mode of transport, but is very costly to implement. The primary challenge, however, is providing enough convenient options to induce drivers of single occupancy vehicles to leave their cars at home.

Transit oriented development and land use.

Importance: One of the best ways to minimize commute time and vehicles miles travelled is to shorten the distance between work and home. The second best is to make it easy to get to work using mass transit.

Activities: The Puget Sound Regional Council (PSRC) is a government agency charged with developing and implementing a regional vision for transportation, economic development, and land use planning. PSRC is led by elected officials from King, Kitsap, Pierce and Snohomish counties, the cities and towns, port districts, transit agencies, and tribes. These entities work together to develop regional solutions and comprehensive plans, such as VISION 2040, which provides guidance for reducing greenhouse gas emissions. VISION 2040 also calls for development of a regional Climate Change Action Plan. The transportation chapter of the plan calls for zoning regulation changes to promote mixed-use and higher-density development to create walk-able and transit-friendly communities.

Land use is a controversial topic in regulatory settings, primarily because of environmental and property rights concerns. Nevertheless, several cities are thinking about transit oriented development and sustainable land use patterns. Twelve are in the initial planning stages of orienting development around transit infrastructure while others are further along. Bellevue has adopted new land use patterns with transit nodes planned for light rail; Black Diamond has placed a moratorium on all new development until its plan is completed; Kirkland is focused on developing compact walkable communities; and Mercer Island is promoting cluster development around transit stations.

Regional Status: The Washington State Growth Management Act currently requires growth to occur in urban growth areas, but does not explicitly require transit oriented growth.

Implementation Challenges: Developing sustainable land use patterns has the potential to have a significant impact, but it is also one of the most challenging actions to take in an area that is largely built-out with massive existing infrastructure. There are also on-going property rights concerns with re-zoning.

Efficiency measures. Almost half of the emissions generated in King County come from energy used to heat and provide electricity for homes, run large and small industries, and transport water. A smaller but significant source of emissions also comes from decomposition of waste products and energy used to transport waste products. Implementing solutions to create more efficient systems, decrease energy use, conserve water, reduce waste, and develop sustainably are priority climate change mitigation activities.

Energy efficiency.

Importance: A tremendous amount of energy is lost every hour of every day through poorly insulated buildings, high energy-demand lighting, and inefficient heating and air conditioning systems.

Activities: The County and several cities have recognized that they can achieve significant reductions in operating costs and emissions of greenhouse gases by reducing their energy use. Consequently, numerous energy efficiency activities are occurring throughout King County. King County updated its Energy Plan in October, 2010 to focus on minimizing the carbon footprint of King County operations by improving energy efficiency and promoting renewable and alternative energy. Strategies outlined include incorporating sustainable development practices in design and operation of all County facilities, converting waste to energy, and investing in alternative technologies. Additionally, an overall focus of the plan is to encourage a green energy economy.

American Recovery and Reinvestment Act. In late 2009, several King County cities received Energy Efficiency Conservation Block Grants through the federal American Recovery and Reinvestment Act to complete energy efficiency retrofits on municipal buildings, develop energy efficiency programs, and switch to LED traffic signals and street lighting. Energy Efficiency through Transportation Planning Grants (EETP) were also recently awarded for energy efficiency projects in the transportation sector. These projects included creating a transit-oriented development plan for a light rail station, assessing bicycle commuter facilities, and developing bicycle and pedestrian level of service standards.

C7 New Energy Partnership. One of the most notable efforts in addressing residential energy efficiency is a group of Eastside King County cities that have formed the C7 New Energy Partnership. One of their current projects is a collaboration with Puget Sound Energy (PSE) and OPOWER to provide bi-monthly Home Energy Reports to residential customers that compares their energy use with anonymous neighbors with similar size homes. This year-long program is designed to help residents increase awareness, decrease energy usage, and lower their energy bills.

Puget Sound New Energy Solutions (PSNES). Puget Sound New Energy Solutions is a regional four-county collaborative partnership that is working to build a new energy economy by linking efficient buildings, clean mobility and smart grids. An example of this is the planned Issaquah Highlands Hub, which is a two city block new energy hub that includes super-efficient zero net energy affordable homes tied into a renewable energy generation grid and a regional transit center with electric vehicle charging stations. The project is planned to realize a 50% reduction in water use compared to the average within the City and will utilize a high percentage

of salvaged and recycled materials. It will also serve as an educational tool with open book accounting and a three month public open house.

Resource Conservation Manager Program. Another program that only a few King County cities have taken advantage of is the Resource Conservation Manager Program offered through Puget Sound Energy (PSE). The program provides assistance in designing and implementing resource conservation strategies, analyzing and reporting savings, providing educational materials, and providing case incentive programs. PSE will typically fund 25 percent of the first year salary and will guarantee that overall savings generated will exceed the salary of the Resource Conservation Manager. Most governments or agencies have achieved a 10 to 15 percent savings over a three-year period.

Other activities. King County, Auburn, Kirkland, and Seattle have installed energy efficient street and traffic lighting and have reduced operating costs. Bellevue, Bothell, Duvall, Enumclaw, Renton, and Redmond are conducting energy audits and retrofits. Kenmore and Shoreline have constructed highly energy efficient city halls. Mercer Island, Normandy Park, and Snoqualmie are promoting energy and water efficiency features in new development.

Regional Status: About half of the cities are engaged in some type of energy efficiency program, but only a few are developing comprehensive energy efficiency plans. This is clearly an area where progress could be made. Cities that are developing or implementing energy efficiency plans include Bothell, Issaquah, Kirkland, Redmond, Renton, and Shoreline. The County is on track to meet its goal of a 10-percent reduction in energy use by 2012 in its facilities.

Challenges: The primary challenge is lack of technical and financial resources to develop and implement programs. A secondary challenge is lack of initiative of local government elected officials.

Water conservation.

Importance: Water management requires a significant amount of energy for delivery and wastewater treatment.

Activities: In the Pacific Northwest, the land of abundant water, there are efforts to conserve water, but it is not a top priority for most jurisdictions. As the population increases and demand for water grows, water conservation programs will likely become more important. Nevertheless, there are several current efforts of note.

Currently, King County and eight cities participate in the regional Partnership for Water Conservation. The Partnership conducts workshops; works to implement policy; establishes best management practices; and provides discounts on water conservation products. In addition to this, a few cities have taken the lead with specific water conservation efforts. Auburn, Mercer Island, Pacific, Redmond, and Seattle have all implemented tiered water rates to reward conservation with cost savings. Bothell provides water-wise gardening education; Duvall is striving to reduce community water use one percent a year; North Bend is requiring 75 percent native drought tolerant plants in all new development; and Snoqualmie is encouraging low flow toilets and showerheads in all new development and allowing rain barrels.

Regional Status: Some efforts but not a high priority. Only four jurisdictions have implemented tiered water rates.

Implementation Challenges: With many other competing demands, intensely tight budgets, and a relatively abundant supply of water, water conservation falls low on the priority scale for many jurisdictions. Without a cost savings, there is a lack of incentive for customers.

Waste reduction.

Importance: Methane gas generated by the decomposition of garbage at landfills contributes to climate change. While the majority of garbage and recycling trucks are now using up to 20 percent biodiesel, they are still generating GHG emissions. In addition, taking waste to a landfill is more expensive than recycling and composting. Waste generation is an inefficient use of resources.

Activities: In 1988, the County adopted a goal to reduce waste in landfills by 50 percent as concerns grew about lack of landfill capacity. This was goal was achieved and now all King County jurisdictions provide recycling services. King County continues to implement innovative solutions to waste reduction and climate change mitigation by diverting as much waste as possible and converting waste to resources. All food and yard waste collected in King County is converted to compost and the methane gas produced at Cedar Hills Regional Landfill is converted to pipeline quality natural gas (King County, 2010c). King County also has the nation's greenest recycling and transfer station with solar photovoltaic panels, rooftop rainwater harvesting, and advanced recycling collection (Geiselman, 2008).

Regional Status: By U.S. standards, King County is above the curve and has provided the infrastructure necessary for large-scale change. On the other hand, Copenhagen has reduced its waste disposal to 3 percent.

Implementation Challenges: The biggest challenge is the underlying throw-away society mentality and the associated packaging materials for products.

Green building.

Importance: Buildings account for a significant portion of GHG emissions. Green homes use less energy and water and create less waste. Green building encompasses energy efficiency, water conservation, waste reduction, and pollution prevention, as well as sustainable site planning. Green building, also known as sustainable building is an international movement. Benefits of green building include cost savings, healthier and safer homes, added market value, and ecological benefit.

Activities: There are many leaders that are out front, including the Pacific Northwest region, and especially King County and some of its cities. King County has made great strides in this area both for county properties and operations and community development. King County's Green Building Initiative, adopted in 2001, encourages and promotes LEED or Built Green standard green building practices in all County buildings. King County's GreenTools, a comprehensive program that addresses all aspects of green building, provides extensive resources such as technical assistance, grant opportunities, and training for governments, developers, and homeowners. Its detailed interactive website provides information and resources for the active green building professional while also enabling even the beginner to understand the concepts and steps towards green building. The County also provides permitting incentives such as priority processing and free customized review for green building projects.

In addition to these efforts, King County is the first local government in the United States to include greenhouse gas emissions in the State Environmental Policy Act's (SEPA) required environmental review of development projects. King County's SEPA checklist now includes GHGs resulting from the extraction, transportation and disposal of building materials, and energy and transportation demands created by the project.

Another successful regional effort is the Master Builders Association's Built Green residential building program. This non-profit program, developed in partnership with King and Snohomish Counties, provides resources, training, and certification similar to the internationally acclaimed Leadership in Energy and Environmental Design (LEED) program. One of the primary differences is that the Built Green program is designed and focused on the Pacific Northwest geographic area and is tailored to the climate, soils, and local rules and regulations. Another key difference is the lower cost of certification.

Regional Status: Out of the 39 cities and towns surveyed, 19 reported that they were encouraging green building and low impact development through incentives and/or technical support. Another four cities said they were requiring aspects of green building or low impact development in all new development. The City of Redmond is out in front with a comprehensive green building requirement planned for all new construction by 2012.

Implementation Challenges: For green building to be fully implemented it needs to be required by all jurisdictions, however the vast majority do not require it. If a jurisdiction does require it, it runs the risk of slowing economic growth by not allowing conventional development; developers will go elsewhere. Most builders in the market have done well with conventional building and do not have many incentives to change their tried and true methods of operation. In addition, in the current economy, many homebuyers are more interested in affordability than sustainability.

Systemic sustainability planning. Most components of human societal systems such as our economy and food production and distribution rely on fossil fuel. Solutions to wean these systems off of fossil fuel dependence and to mitigate emissions need to be addressed comprehensively. Identifying areas where changes are most needed and most feasible is a good

first step in addressing systemic emission reduction and sequestration. Numerous jurisdictions are accomplishing this by completing GHG inventories and developing climate action and tree retention plans. Some jurisdictions are even developing renewable energy programs and projects.

Challenges to comprehensively addressing climate change include a lack of understanding of its causes and effects, insufficient information on successful policies and activities, and inadequate coordination and communication within a jurisdiction. Outreach and education can increase understanding and provide decision makers with the background information that is necessary to prioritize needed action. Performance management metrics can also greatly aid in prioritizing and decision making, and interdepartmental green teams can integrate efforts and ensure the policies are being implemented efficiently. To implement substantial climate change mitigation, efforts in all these areas need to be increased.

Internal coordination and collaboration.

Importance: Sustainability issues, and particularly climate change concerns, are systemic; they are not isolated to one department or project. Solutions, therefore, need to be integrated throughout an organization such as a local government. Often one department does not know what another department is doing. In some cases, one city project could be causing the problem while the other is trying to fix it. Having an interdepartmental team that can identify the linkages and ensure that the organization as a whole is on the same page and implementing the overarching adopted policies consistently can greatly increase overall efficiency and sustainability.

Activities: Several jurisdictions accomplish this by establishing an interdepartmental green team or an office of sustainability or resource conservation. Auburn, Bellevue, Bothell, Issaquah, Kirkland, Mercer Island, North Bend, Redmond, Seattle, and Shoreline all have some type of

green team or sustainability office. Covington, Lake Forest Park, and Snoqualmie have recently disbanded their green teams due to budget cuts. Federal Way also discontinued its green team due to time constraints on staff, but they recently hired a Resource Conservation Manager to oversee sustainability related activities that can also provide cost savings.

Regional Status: Ten cities are utilizing an interdepartmental system to increase internal coordination and collaboration related to sustainability issues. Three cities have recently discontinued these efforts.

Implementation Challenges: Reduced budgets and increased time constraints were the primary reasons identified for discontinuation of existing efforts. In jurisdictions where there has not been any history of this type of effort, it was not seen as a priority.

Climate action plans and GHG inventories.

Importance: The first step to mitigating climate change is to understand the sources of emissions and develop a plan to eliminate or minimize them.

Activities: King County is one of the leaders in the region for climate planning. Its Climate Plan was created by a multi-disciplinary team of county staff and calls for cleaner and fewer cars, improved land use and building design, and energy efficiency. It also seeks to establish greenhouse gas accountability and limits. "The steps we have outlined are achievable and critically needed as we face an environment that is rapidly deteriorating due to global climate change," said Sims. "We need to use the resources and political will at our disposal to adapt our habits to respond to what the science shows works to stop climate change now, before it's too late" (King County, 2007a).

A few King County cities have also developed climate change plans, while others are developing or implementing sustainability plans that are inclusive of climate change mitigation

activities. Bellevue, Bothell, Issaquah, Kirkland, Seattle, and Shoreline have all outlined and begun implementation of specific municipal climate change mitigation actions. Auburn, Mercer Island and Snoqualmie are implementing overarching sustainability strategies. Redmond, Renton, and Sammamish are in beginning to final planning stages of developing comprehensive sustainability strategies. ICLEI is supporting eight cities in development of plans and strategies. Carnation, Duvall, Federal Way, Lake Forest Park, North Bend, Pacific, and Seatac are currently updating or developing some sustainability policies or programs. Beaux Arts Village, Black Diamond, Burien, Clyde Hill, Des Moines, Enumclaw, Kenmore, Kent, Maple Valley, Medina, Normandy Park, Tukwila, and Yarrow Point each have some sustainability policies or strategies with some initial or minor implementation.

An important aspect to climate change mitigation planning is to conduct a greenhouse gas emission inventory. This is a significant initial step towards climate change action and has a strong correlation to emission reduction efforts (Rice, 2008). Increasing awareness across the board of what actions are generating emissions provides impetus to initiate and sustain action. King County and twelve cities have conducted GHG emission inventories and all have agreed to some type of emission reduction goal.

Regional Status: Out of 39 cities and towns, eight are current members of the International Council of Local Environmental Initiatives (ICLEI) and 17 have signed the Mayor's Climate Protection Agreement and have adopted some type of emission reduction goal. Twelve cities are implementing comprehensive solutions, seven are actively engaged in sustainability programs or projects, thirteen have some minor programs and seven appear to not be engaged in sustainability or climate mitigation planning or activities.

Implementation Challenges: Political will is the biggest hurdle in most jurisdictions followed by budgetary constraints and lack of staff time. There is also the challenge of continuity. While one mayor or council might fully support an initiative, such as the Mayor's Climate Protection Agreement, the next mayor or council might not; three jurisdictions surveyed were not even aware that a previous administration had signed the agreement and were not taking any significant steps towards reaching its goals. In addition to this, some decision makers agree to goals and commitments, but do not take the necessary steps to implement them.

Tree canopy protection.

Importance: Trees and vegetation sequester carbon, which helps reduce GHG concentrations in the atmosphere, and absorb stormwater runoff, which minimizes flooding. They are relatively simple tools that provide multiple environmental and social benefits.

Activities: Eighteen King County cities are members of Tree City USA and 22 cities are actively promoting tree protection. The minimum standards for Tree City USA recognition are to have a tree board or department, a tree care ordinance, and a community forestry program with an annual budget of at least two dollars per capita, and to observe an Arbor Day.

In addition to individual city efforts there is a collective regional effort called the Mountains to Sound Greenway, which stretches over 100 miles along Interstate 90. The Mountains to Sound Greenway Trust is the nonprofit organization founded in 1991. Its focus is to encourage public land acquisition and protection through environmental stewardship. The area includes natural areas such as lakes, rivers, and wildlife habitat, as well as hiking trails and working forests and farms.

Regional Status: Despite the numerous efforts to protect trees, the tree canopy has steadily decreased in the region (American Forests, 2005).

Implementation Challenges: Existing regulations allow for a significant amount of tree clearing for development. Stricter protection regulations were passed a few years ago by King County but were overturned on a property rights appeal to the Growth Management Board.

Renewable energy.

Importance: The need for energy continues to grow with the expansion of King County's population and with the requirement to sell electricity to California. As this demand increases, other sources of climate neutral sources need to be identified and implemented. While the majority of electricity in King County is generated from hydropower, about 30 percent is generated from coal.

Activities: Jurisdictions and homeowners have the option to pay a little extra and utilize only green power from renewable sources. Currently 6,700 residential and 100 commercial customers purchase green power. In addition, another 88 customers generate their own power and sell back to the grid. Puget Sound Energy also generates some of its power from the Cedar Hills Landfill waste-to-energy methane gas production.

King County has invested in renewable energy and has successfully implemented energy-capture programs at its landfill and wastewater treatment plants. Through a partnership with the U.S. Environmental Protection Agency (US EPA) and FuelCell Energy Inc. the County developed the world's largest digester gas fuel cell. It generates 1 MW of electricity without combustion or pollution and produces a useful heat byproduct. It is located at the South Wastewater Treatment Plant and utilizes the biogas generated from the sewage treatment process.

There are numerous other small scale projects that cities are implementing. Redmond's high school is currently utilizing geothermal energy and there are plans to expand its use. Kirkland is

also contemplating geothermal use. Mercer Island helped the school district acquire a grant to install a solar panel on its high school. It has also purchased a biofuel station but have not yet activated it. North Bend is utilizing vegetable oil from its local casino for biofuel and Snoqualmie is incentivizing a community solar program.

Regional Status: Overall, the energy generated from renewable sources off the grid is relatively small, but these projects are illustrating that renewable energy is feasible. The County is actively engaged in promoting renewable energy, but only a few cities are considering or implementing projects.

Implementation Challenges: There are numerous opportunities for renewable energy generation, but all large-scale potential projects require substantial financial outlay to develop.

Environmental outreach and education.

Importance: Increasing a stewardship ethic and related activities goes hand-in-hand with understanding and appreciating nature and environmental concerns.

Activities: King County, Bellevue, Bothell, Federal Way, Issaquah, Kirkland, Mercer Island, Redmond, Seattle, Shoreline, and Snoqualmie all have robust environmental education and outreach programs, which include some climate related sustainability education. Lake Forest Park, Normandy Park, North Bend, and Tukwila also provide some community environmental education.

Regional Status: Less than half of the cities and towns are providing any education on the importance of climate change mitigation.

Implementation Challenges: The biggest challenges are budgetary constraints and political acceptance.

Performance Measures.

Importance: Measuring progress on success will help identify which programs and projects are most effective.

Activities: King County and a few cities are just starting to conduct GHG inventories on a somewhat regular schedule. These will provide some measures of effectiveness. One of the easy performance measures that most jurisdictions utilize is energy bills, which clearly outline energy usage. Puget Sound Energy's Resource Conservation Manager Program provides local governments and organizations software and analysis tools for quantifying resource use.

The University of Washington and CH2M HILL are developing a sustainability rating system for roadway design and construction called Greenroads. There are several pilot projects throughout the country and one in Seattle.

Regional Status: A few cities are utilizing Resource Conservation Managers and others are developing some metrics, such as the GHG inventories and energy use data. There is initial activity in this area, but nothing comprehensive.

Implementation Challenges: Many of the activities discussed are relatively new and there is a limited availability of tested metrics. In addition, with tight budgets developing performance measures and tracking progress are not top priorities.

Summary King County climate change mitigation activities. This case study illustrates the primary climate change mitigation activities that King County local governments are involved in. Through their efforts the County and cities and towns have achieved much success on their own and with the support and collaboration with other organizations. Table 4.1 below summarizes these activities and the associated organizations that are actively involved in these efforts.

Table 4.1

King County Primary Climate Change Mitigation Organizations and Activities

Organization	Transportation	Efficiency Measures	Sustainability Planning
King County Government	EV infrastructure Biodiesel metro fleet Evergreen Fleet Program	2010 Energy Plan Green building promotion (GreenTools) Community water conservation Waste to resources	GHG inventories Climate action plan Renewable energy
King County Cities and Towns	EV Infrastructure Green fleets Transit oriented development Commute trip reduction	Energy efficiency retrofits Green building Community water conservation Waste reduction Resource Conservation Manager program	GHG Inventories Climate Action Plans Education and outreach
State Government	Commute trip reduction regulation Electric vehicle infrastructure policy	Energy efficiency regulation	Greenhouse gas reduction policies
Federal Government		Funding: American Recovery and Reinvestment Act	
Puget Sound Clean Air Agency	Evergreen Fleet program Climate protection plan Diesel retrofit program Clean gasoline program Clean School Bus program		Education and outreach
Puget Sound Energy		Resource Conservation Manager program Home energy audit program	Waste-to-energy production
Seattle City Light	Biodiesel program	Energy conservation programs	
Puget Sound Regional Council	Regional transportation/land use planning Variable tolling program		
ICLEI			Technical support and outreach for: GHG emission inventories Climate action plan development
C7	Developing electric vehicle charging station informational resources for the community	Coordinating and promoting Home Energy Audit program	
New Energy Solutions	Linking efficient buildings, clean mobility and smart grids		
Partnership for Water Conservation		Regional water conservation programs	

Obstacles to Climate Change Mitigation

Obstacles and challenges to climate change mitigation at the local level are numerous and vary in degree of difficulty depending on the political, regulatory, and economic environment. The formation and implementation of local climate change policy has been limited by the resources and powers of local government, and by conflicts between economic and environmental objectives. As cities are critical arenas for the pursuit of sustainable development, these findings have significant implications for the prospects of mitigating climate change and achieving urban sustainability.

Inconsistent policy. One common concern in most countries is that local policies do not necessarily match national or state policies. Many nations and states are still formulating polices and jurisdictions that want to take action run the risk of getting out ahead of a national mandate or direction, which might end up costing them more money, or even legal complications. Even with the current policies in place, there is vague language in some cases, which creates uncertainty at the local level. “This means that there are wide differences in the assumptions being employed and the expectations that local governments are placing on themselves versus others to act” (Sugiyama & Takeuchi, 2008, p. 435). King County and some of its cities and towns are implementing policies that are not mandated or endorsed by state and national governments. One example of this is the commitment made by the County and several of the cities to meet or exceed the emission reduction goals of the Kyoto Protocol. The national government has not made this commitment.

“Even if there is both knowledge and motivation, climate policy may still stumble because there is a lack of effective organizational structures” (Lundqvist & Biel, 2007, p. 8). Because of the systemic nature of climate change actions, another concern is lack of coordination of policies

within a single jurisdiction. In many jurisdictions there is an absence of a comprehensive or cross-departmental policy, “which prohibits a cohesive response” (Roberts, 2008). This can contribute to miscommunications, unbalanced levels of commitment, and turf wars and can be counter-productive to implementing climate change actions. Increasing collaboration and communication can help alleviate these concerns.

Economic considerations. Monetary constraints are a constant concern for most jurisdictions, however in the current recession budget cuts have left many important programs and good ideas in the dust. Economic considerations are given a higher value than social or environmental considerations throughout most economies, regardless of the long-term or systemic impacts. This thought pattern has become ingrained in most cultures and is “constantly reproduced through communication” (Henning, 2008, p. 232). When faced with an argument or negotiation, options that can espouse greater economic gain, or lesser economic loss, are usually considered to have an elevated level of credibility. “Economic objectivity is nothing more than a culturally formed representation of the world” (Henning, 2008, p. 232). Most people, particularly in developed nations, perceive society through a monetary and materialistic lens, giving economic considerations a distorted level of power.

Economists argue that “emissions are the quintessential public good. The damage caused by global warming in a given location is completely independent of the location of the emissions source, but the costs are carried by the actor that reduces emissions” (Urpelainen, 2009, p. 82). Economic free-rider theory asserts that free-riders are those who consume an inequitable amount of a public resource, or don’t take responsibility for the conservation or protection of a shared resource. Some government officials are using this argument to support inaction. The good news is, however, that many local policy actions, such as those in King County and many of its

municipalities, are defying the free-rider theory by preceeding national commitments and international agreements to implement GHG reduction strategies.

Inadequate resources. "Climate change needs to be explicitly factored into planning and development of programs" (Cashman, Nurse, & John, 2010, p. 63). This requires tremendous resources at the local scale. In particular, it requires that planners have the knowledge, tools, and time to address spatial planning issues. Spatial planning is central to success in implementing climate change action (O'Neill, 2008). Lack of spatial planning over the past few decades and consequent zoning that contributes to sprawl has greatly contributed to many of the concerns facing today's planners. Existing planners have so much on their plates right now, and there are not "enough planners with the necessary skills to carry out the agenda," (O'Neill, 2008, p. 2).

Systemic incompatibility. The more significant actions required to address climate change, such as drastically reducing use of fossil fuel for energy, eliminating waste, and exponentially reducing vehicle miles travelled through an increase in mass transit and changes in land use zoning, all require underlying infrastructural and value-based systemic changes, which are immensely complex. There is no easy fix.

Rhetoric vs. reality. The momentum at the local level is building and comprehensive responses are being implemented, however, elected official rhetoric in some countries is slowing progress. Being green and talking green is often not the same thing. Many promises of climate change mitigation are being made by jurisdictions throughout the world, as well as in King County, in large part due to the influence of network activities, but some of these promises are left unfulfilled. Advocates are asking why and some are seeking legal means to hold jurisdictions and agencies accountable (Anders et al., 2009).

In the United States, the general public and elected officials have only recently started to recognize the severity of the repercussions from climate change; the lack of national leadership for eight years and the corresponding propaganda that disputed scientific findings greatly influenced public opinion and slowed progress. A 2003 survey showed higher levels of concern in Western Europe than in Canada and the United States. “There were larger protests across Europe than in the US itself when the Bush administration announced in 2001 that the US would not ratify the Kyoto Protocol” (Harrison & Sundstrom, 2007, p. 6).

Under new leadership, and in light of international consensus, this is changing and local leaders are starting to take action. Nevertheless, there are still many with conservative political views that do not see the necessity for action. They might make promises to comply with mandates or public opinion, but not expend the effort or resources to actually fulfill the commitments. On the other hand, some politicians believe the science, but might not be “willing to accept political risks in order to pursue a personal commitment to environmental protection” (Harrison & Sundstrom, 2007, p. 8).

Another consideration is that climate impacts are perceived to be a medium to long-term concern. They generally occur slowly over time and although the cumulative impacts are significant, they do not present as a typical type of crisis (except during extreme weather events). This makes it easier to procrastinate or delay action when more current and pressing concerns arise.

The most prevalent reason for this discrepancy, however, is that the solutions are multi-faceted and not easy. They present new technical challenges that planners do not have the education or training to address and they often require systemic changes that are politically and fiscally challenging at a time when resources are scarce. Government officials and the public

might want to address climate change and publicly agree to do so, but then realize when planning implementation that the actions needed require changes that the public or special interest groups won't support, such as higher taxes or stricter regulations. "Good intentions confront persistent interest group opposition when the hard work of devising policies to deliver emissions reductions proceeds out of the limelight" (Harrison & Sundstrom, 2007, p. 17).

Addressing climate change on a comprehensive and global scale presents difficulties in that there are no examples to learn from; we only have one global climate system and this is the first time human society has addressed this issue (Norberg & Cumming, 2008). At the local scale, the amount of information and tested strategies is greatly limited compared to other natural resource management efforts. The primary obstacles identified in this review are summarized in Table 5.1.

Table 5.1

Obstacles to climate change mitigation

Methodological	**Administrative and Procedural**	**Implementation of emission reduction goals**
Insufficient data, including wrong units or missing years[1] Lack of accurate energy use data at the postcode level[2]	Lack of coordination with regional entities and nearby municipalities[1]	Lack of funding for implementation [1,2]
Difficulty obtaining data from private utilities[1]	Lack of funding to complete planning process[1]	Social or cultural obstacles among community members and stakeholders[1] Lack of engagement of the wider community[2]
Uncertainty in measuring transportation emissions[1]	Limited technological capabilities on part of municipal staff[1] Lack of professionals with wide-ranging skills in addressing climate change[2]	Difficult achieving transportation reductions due to regional nature of the transportation issue[1]
Policies are often not developed within an integrated urban planning framework[4]	Uncertainty or conflicting goals related to emission reduction targets[1] Lack of inter-departmental cooperation[2]	
	Uncertainty of jurisdictional authority [3]	
	Lack of control over key areas of decision making [3]	
	Concurrent or overlapping mandates that hinder policymaking [3]	
	Lack of statutory requirements sometimes results in local authorities not prioritizing climate actions, which are often competing for other resources. [2]	

[1]Pitt and Randolph, 2009
[2]Allman, et al., 2004
[3]Richardson, 2003
[4]Corfee-Morlot, 2009

Summary

This case study identified climate change mitigation actions currently being undertaken by King County government and its cities and towns, and identified related implementation challenges and obstacles. The overarching finding is that there is a tremendous amount of activity occurring in this region that is related to reducing greenhouse gas emissions. The study illustrated numerous activities that several cities and towns are successfully participating in that are reducing GHG emissions while achieving co-benefits of cost savings and improved air quality. For cities and towns that are considering climate change mitigation activities, this provides excellent examples of local, successful projects and programs.

In comparison.

National context. Many of the findings from this case study are similar to findings from a recent national sustainability survey of county governments conducted by the National Association of Counties (NACO, 2010). The NACO survey, with 572 respondents, found that in the current economy strategies that save money, such as energy efficiency upgrades and renewable energy generation, are the most common sustainability related activities. Nearly half of the respondents said the most important benefit realized from sustainability efforts is cost savings. While this was not one of the survey questions for this case study, it was a strong theme within the responses. Several of the jurisdictions commented they were marketing sustainability efforts to their councils, mayors, and other decision makers as cost saving measures.

The King County survey found that 78 percent of the responding cities are engaged in some type of sustainability strategies, which is slightly higher than the national county rate found in the NACO survey of 68 percent. Another recent survey of city and county governments completed by the International City/County Management Association (ICMA), however, found

that most local governments are just at the beginning stages of concrete sustainability and energy conservation strategies. Out of 2,176 respondents only 29 percent have adopted specific sustainability policy goals, which is significantly lower than the King County findings. In the same survey, however, 70 percent of respondents identified energy conservation as a priority and 62 percent consider the environment a priority (ICMA, 2010).

Fifty-three percent of King County cities have established some type of GHG emission reduction goals, which is significantly higher than a national average of 14 percent, according to the ICMA survey (ICMA, 2010). Also higher than the national average, 68 percent of responding King County jurisdictions are actively promoting tree protection and 56 percent have a tree management program. The ICMA survey found that 45 percent of local governments have a plan for tree preservation and planting.

When looking at these survey results and percentages it is important to remember that these represent the jurisdictions that responded and not all jurisdictions. When conducting the King County survey I investigated the jurisdictions that did not respond to the survey by reviewing their governing documents and websites and I found that most were not undertaking any significant effort in the realm of sustainability or climate change mitigation. Consequently, the numbers are slightly skewed if considering percentage of actions in all jurisdictions.

Electric Vehicle Infrastructure (EVI) offers a tangible hope for the future of reducing dependence on fossil fuel for transportation. The end outcomes are greater in regions that are primarily supported by renewable and low or non-emission producing sources of energy, such as hydropower, solar, and wind. The State of Washington is one such place and King County is utilizing this advantage. King County and Washington State governments are providing support to King County cities in developing EVI through incentives, funding, and regulations.

Washington State Department of Transportation is developing the first electric vehicle-friendly National Scenic Byway route as well as contributing to the I-5 "electric highway" with installation of fast chargers (Washington State DOT, 2010). Oregon, California, and Arizona are also developing EVI in highly populated areas and along major routes.

Global context. Globally, Europe is the current leader in electric vehicle infrastructure manufacturing production however market experts expect North America and Asia to start catching up around 2014 (SBI Energy, 2010b). The U.S. has the most potential with the largest vehicle market in the world. The primary motivators for the growth in EVI are the cost of gas, support of local, state, and national government, and cost differential (SBI Energy, 2010a).

As described within the case study, there are several examples of sustainability policies and programs within the jurisdictions of King County, some more progressive than others, such as Redmond's planned comprehensive green building requirement and Issaquah's zHome zero energy home project. Similarly, England has the successful Beddington Zero Energy Development. One of the most intriguing policies in Europe is the Merton Rule, which requires all new development to include a renewable energy component. This policy was developed by the Merton Borough Council and has been adopted by a large percentage of local governments in England. It has also become part of national planning guidance and has spurred industry development of construction and renewable energy products to meet the growing demand (Gearty, 2008).

Seventeen King County cities are members of one or more climate action networks, such as ICLEI or the Mayor's Climate Protection Agreement, that support goal creation, emission inventories, and plan development. These are the largest two networks in the United States, although there are several other networks with smaller geographic parameters. ICLEI is also well

established internationally. In Europe, one of the largest networks is the Climate Alliance that brings together cities and indigenous peoples in setting and meeting emission reduction goals as well protecting the rainforest. Another large European network that was recently formed is the European Covenant of Mayors. Another emerging international network that originated in England is Transition Towns that focuses on urban issues. Whatever their size, local, national, and transnational networks are playing a huge role in connecting cities with each other, providing resources and technology to implement actions, and bringing climate change action to the forefront. “Networks have provided the resources and political space within which policy entrepreneurs can operate with some degree of protection from ‘politics as usual’” (Bulkeley, 2010, p. 234).

Challenges. The most significant challenges identified in the case study were the lack of funding, staff time, and political will. Some local government staff members identified the need for external drivers. They were concerned that conservative decision makers needed a state or other mandate to spur climate change mitigation activity. Other challenges identified during this process were continuity and lack of serious commitment from some local governments; a few local elected officials have made commitments to implement climate change mitigation activities but have not followed through. This has frustrated regional leaders who depend on broad-based collaboration for large-scale change. The NACO survey concurred with two of these findings stating that the most significant challenges for implementation of green government initiatives throughout the country were funding and lack of staff time.

Despite all of the activities occurring, in many jurisdictions globally and within King County “climate change remains a marginal issue, usually confined to the environmental wing of local authorities and disjointed from other areas of policy making” (Bulkeley, 2010, p. 235). Part of

the problem stems from a "gap between rhetoric and action. Explanations for this gap vary from case to case but focus on issues of institutional capacity and factors of political economy" (Bulkeley, 2010, p. 249).

Potential future research. There are many areas where future research would help to further understand the dynamics and implications of climate change protection work. I've identified the following areas during this study:

- Developing methods to directly assess the impact of policies and measures on emission reduction is of great importance.
- Identifying how state funding policies could be modified to encourage sustainable development. As state regulations come more into play there will likely be an increased effort to update state grant and loan eligibility criteria to ensure that jurisdictions are looking at systemic solutions and utilizing funds to meet state emission reduction requirements.
- Measuring the degree of which comprehensive plans are being implemented, and considering mechanisms to encourage full implementation.
- Correlating the relationship of internal green teams with overall municipal and community sustainability indicators, and considering mechanisms to encourage jurisdictions to institute internal green teams.

Conclusion. King County and its cities and towns would not have achieved the level of success without champions that brought the issues to the table, educated decision makers and peers, and persistently sought to create change. Throughout the world, cities contribute the majority of greenhouse gas emissions and consequently need to be an integral part of mitigation efforts. This case study and other similar surveys of local governments, show that most local

governments are beginning to embrace the ideas of sustainability, even if only on a cost savings platform, and many are making substantial progress to systemically integrate sustainability strategies.

Chapter V: Results of Participatory Action Research Process

Introduction

In this chapter I present the results from part two of my dissertation research project. In the previous chapter I provided a case study of climate change mitigation activities and challenges in King County and its 39 cities and towns. The case study laid the groundwork and provided the necessary background information for the second phase of this research. This phase constitutes a Participatory Action Research process with King County, nine of its cities, and ICLEI. The process involved several strategy meetings, three workshops, review with a third party observer, and a presentation and discussion with seventeen of King County's cities and towns. The research and process of this phase went beyond the original scope and included a launching of the resulting proposal and initial implementation of the recommendations.

Purpose of Research

Mitigation actions at all levels are necessary to reduce greenhouse gas emissions and address the growing impacts of climate change. National and international governments and organizations are expending tremendous effort to comprehensively and systemically reduce and sequester emissions through policies, regulations, and incentives. Some countries and states are taking bold action, setting aggressive goals and implementing assiduous policies and operational and systemic changes. Others are not. In the United States, strong federal regulatory policy is lacking, providing little guidance for its states and local governments. Several state and local governments, however, are not waiting for national direction. They are beginning to take action and successfully implement local projects and programs that are seeing results. The purpose of this research is to develop and utilize a collaborative model to assist local governments in furthering and expanding climate change mitigation activities, and to answer the following

questions:

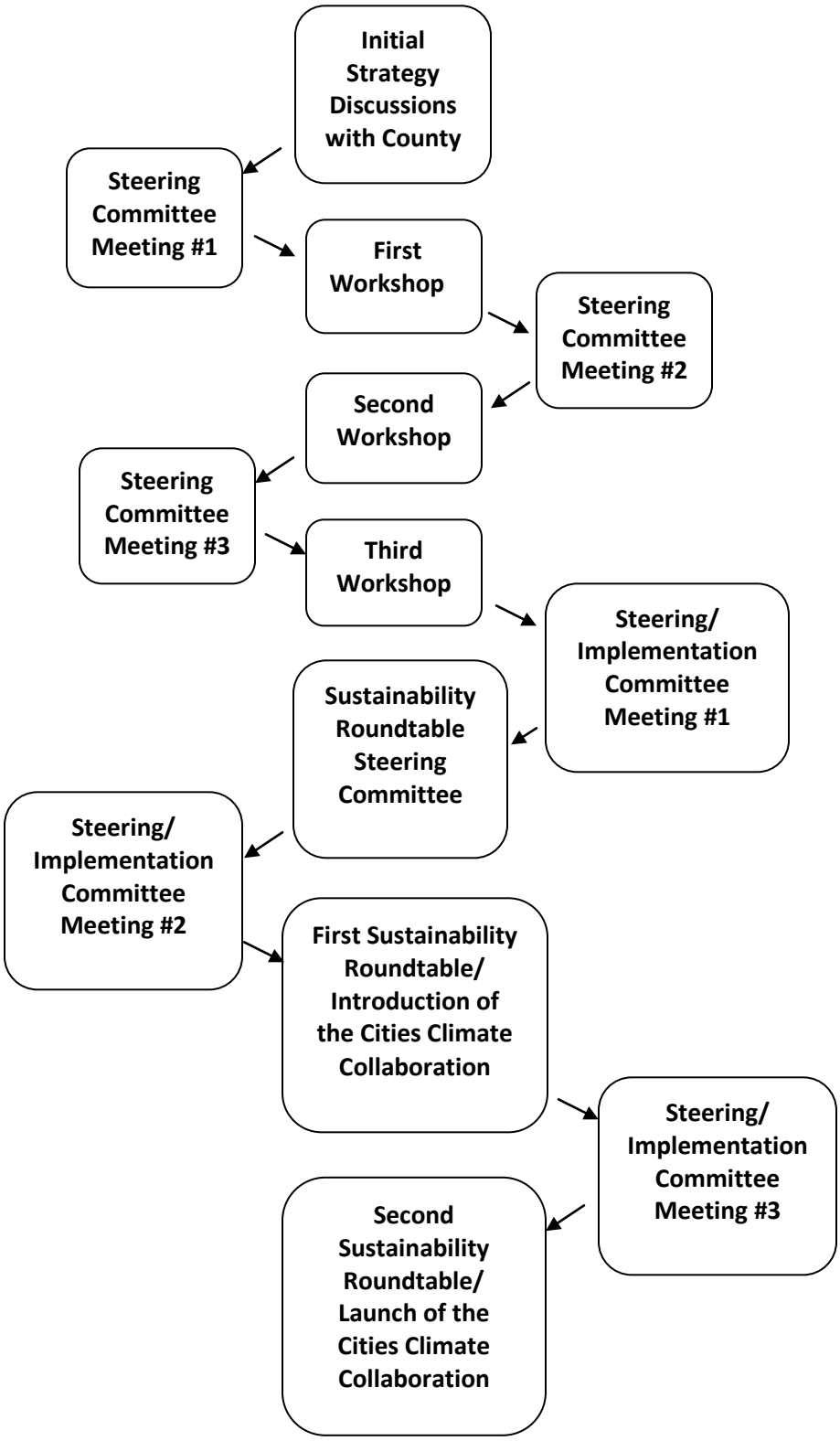
1. What are the primary needs and challenges of cities and towns implementing climate mitigation actions? In what ways can county governments effectively help address those needs and challenges?
2. On what actions are cities and towns interested in working? Which actions are appropriate for joint cooperation and collaboration?
3. What are the best ways to implement these actions? How do multiple jurisdictions effectively collaborate to share resources and expertise in climate change mitigation efforts?
4. What are the advantages of multi-jurisdictional collaboration?
5. Is collaboration an effective motivator for change?
6. How can commitment be achieved?
7. Can an intervention of this type be a good way to catalyze interest and action?

Process and Outcomes

In this section I will focus discussion on the process in a predominantly chronological order, as depicted in Figure 5.1. The findings and outcomes will be discussed in the Results section.

Figure 5.1

Participatory Action Research Process Diagram



The Participatory Action Research process began when I first approached King County to identify a research project. In addition to the case study, the climate change specialist from King County and I agreed to develop a collaborative process with several of the cities to further climate change mitigation. He became the County lead for the project and we worked closely together throughout the process. As I conducted the telephone survey and in person interviews for the case study, I asked respondents if they would be interested in working with me, King County, and other cities and towns in a collaborative process to develop a proposal to expand climate change mitigation activity. Initially ten cities expressed strong interest but one dropped out due to unforeseen illness. Ultimately, nine cities participated in the process. My target was to include between five and ten cities in the Participatory Action Research phase, so this was an ideal number. Other participants included representatives from King County and a regional representative from ICLEI.

Role of researcher. My role as researcher of this Participatory Action Research process was to facilitate and lead the process. I did the bulk of the work preparing for meetings, writing up results, preparing materials, identifying and confirming presenters, and communicating with all the participants. I provided ideas and guidance, but I encouraged the individuals in the group to provide their ideas and to determine the direction and content of the proposal and recommendations. I did not start with a pre-described notion of what the outcome would be.

At the beginning of each meeting and workshop, I would request any changes or additions to the agenda. At the end of each discussion item I would again check to make sure everyone's thoughts and opinions had been captured and addressed. I purposely designed a flat hierarchy to encourage full participation and ownership of the process. I operated under the principle that leadership is a team effort.

I worked closely with the County lead to discuss ideas and strategy and to seek input on draft materials prior to distributing them to the group. He provided useful feedback and ensured that the process stayed within the parameters of the County's priorities. He also provided a conduit to other County staff that became involved in the project. He was a little uncomfortable at times not being in control of the group or process, but he was patient and thoughtful and eventually relaxed and trusted the process. It was important to me to have his involvement and buy-in as he would be the one to lead implementation of the recommendations and process once I had completed my research.

Steering committee. Once the participants had been identified, the next step in the process was to identify a steering committee to help guide the process. I wanted a group of individuals that would bring different perspectives, were highly knowledgeable about climate change mitigation activities, and were committed to the process. The first member chosen for the committee was the County lead. The second member was the ICLEI representative. I felt his participation was important as he was already engaged with several of the cities in climate change mitigation activities through the Cities for Climate Protection program. The final three members were chosen from three of the cities that had demonstrated an understanding of a need for the process and had expressed a high level of interest in participating. The six members of the steering committee, including myself, met before each of the three workshops to discuss ideas and strategy and set agendas.

Workshops

The following section provides details of the three workshops that were held, including workshop objectives, the process undertaken to meet those objectives, and the outcomes of each workshop.

Workshop #1. The first workshop was packed with information and energy. It was a three hour workshop and was held in one of the King County conference rooms. We chose this location to lend the effort some legitimacy and display county support. Three county staff, one ICLEI representative, one third party observer, and eight city representatives participated.

Objectives. The steering committee identified three primary objectives for the first workshop:

1. Allow time and opportunity for everyone to get to know each other;
2. Provide an overview of current mitigation and collaborative activities throughout King County; and
3. Begin discussion and prioritization of ideas and opportunities the group might be interested in working on.

To meet the first objective we intentionally started a few minutes late to allow people time to talk, and scheduled a 15 minute break half-way through the meeting. We also provided refreshments.

For the second objective, we planned a series of presentations. Prior to the meeting, I distributed a packet of information to each participant about the presenters and topics. I began the meeting by introducing myself and asking everyone to introduce themselves. I then gave a description of the purpose and goals of the project and presented an overview of my initial findings from the survey and case study. Following my presentation, the county lead provided a presentation on his role in the project, and discussed a major county-wide Community Emission

Assessment project on which he was working. After his presentation, we had five more presentations about different significant projects and programs occurring throughout the County.

To meet the third objective, prior to the workshop I gathered information from the survey about the cities and towns interests and needs. I categorized and summarized these and wrote them on large white boards. During the break, I set these out so everyone could see them. After the break I gave each of the city representatives five green dots and each of the other participants, except for the third party observer, three red dots. I did this so everyone could easily ascertain which items were seen as priorities to the cities and to the other participants. I then asked each participant to place their dots next to the items they were the most interested in working on together in a collaborative group. Everyone was allowed to place as many dots as they wanted on any specific item. Following the dot exercise we discussed the results and identified priorities to discuss in more detail at the next workshop.

Outcomes from Dot Exercise. The following list of top scoring ideas for collaboration was generated from the dot exercise. This is prioritized based on the number of votes received from city representatives and does not include items that received less than 3 city votes.

1. Develop technical assistance resources for implementing programs.

    Technical assistance was the most popular item receiving 10 city votes and 2 other votes and was inclusive of the sub-headings below:

    - Resource people at the county with specific areas of expertise (free or fee-based)
    - A forum like the GreenTools and Sustainability Roundtables with meetings and topic specific workshops
    - Webinars, open phone conversation with information presented in advance
    - Manuals like natural yard care, hazardous materials

2. Develop an action oriented network of King County cities and towns focused on climate change mitigation activities.

   This item received 8 city votes and 5 other votes and was inclusive of the sub-headings below:

   - Share resources and ideas: educational materials, messaging, regional data resources, performance measures, benchmarks, code interpretation, etc.
   - Collaborate on pilot projects
   - Collaborate on developing regional grant funding opportunities
   - Regular monthly or quarterly meetings

3. Compile hard data to support best practices for programs

   This item received 5 city votes and 2 other votes.

4. Influence regional and state policy development and legislation

   This item received 4 city votes and 2 other votes,

5. Translate actions to cost savings to support presentation of ideas to other departments and city councils

   This item received 3 city votes and 1 other vote,

Outcomes from discussion. During the discussion following the dot exercise some of the ideas were elaborated on, new ideas were generated, and one idea was unexpectedly altered.

The Technical Resources category was very popular and the group discussed what type of resources might be most helpful, such as:

- A team of county experts that could act as roving consultants. This could be a free or fee-based service for cities.
- A city and county shared technical expert ‘pool’.

- Model tools

A couple of additional ideas that were generated include:

- Development of a regional vision and associated goals
- Development of regional climate profiles

An unexpected outcome that occurred during the discussion that took most of the group by surprise was the advice of the ICLEI representative to not form a new network. All of the cities had voted for this idea and it had generated a great deal of energy and enthusiasm. The excitement in the room was palpable. Equally palpable was the deflation of energy following this discussion. He suggested instead of creating a new network, to make existing networks more efficient. One of the city representatives agreed and supported his thinking. It was agreed we would think about this and discuss it more at the following workshop.

Workshop #2. The second workshop was held in one of the cities' conference rooms and was attended by two county representatives, seven city representatives, and one third party observer. Participating cities were asked if they wanted to host the second and third workshops to foster a sense of collaboration and ownership of the process. The steering committee identified the following primary objectives for the second workshop:

1. Discuss the process and structure for collaboration
2. Review prioritized list of ideas from previous workshop, brainstorm new ideas, and further prioritize and refine
3. Identify possible linkages with existing efforts

To achieve the first objective, I presented a table of a few existing networks and collaborative efforts and asked the group to assist in completing the table. This exercise was designed to educate everyone about what types of collaborative efforts already existed that we weren't

previously aware of, and to assist us in identifying what our niche might be, or whether we should align with an existing effort. I had the table on my laptop and had it projected on a screen. As the group provided ideas I filled in the blanks. In planning this exercise it seemed like a simple process, however it was not. One of the participants did not understand the intent of the exercise and kept taking the discussion in a different and not useful direction, despite repeated attempts to explain and re-focus the discussion. I consequently switched gears to focus on the second objective.

For the second objective, I displayed white boards with the refined list ideas for projects and programs from the previous workshop in the front of the room. I asked participants for any new ideas they wanted to add to the list and none were provided. I then gave each of the participants a set of colored dots and asked them to again prioritize. Following this exercise, we discussed the results and placed them in two categories: short-term and long-term. From the new prioritized list it became relatively clear that the group wanted to develop a new independent collaborative effort, but wanted to utilize and augment existing efforts where it made sense to do so.

We then shifted the discussion to address the third objective and identify existing linkages. Fortunately, the leader of one of the existing processes (Sustainability Roundtable) that the group was interested in working with was at the meeting and was very interested in collaborating with the group and possibly shifting focus to accommodate our interests. A lengthy discussion ensued and we agreed to develop a proposal that included the Sustainability Roundtable. The group also decided they wanted to develop a pledge that would be signed by city councils and mayors that promised commitment to a collaborative effort. Several other items were also identified that the group wanted to include in a draft proposal.

Outcomes from table exercise. The table exercise did not prove to be a useful method of

compiling information. This was due to a couple of factors. The first was a misunderstanding of the scope of information I was seeking. In the steering committee meeting we had decided to compile a table of existing local networks and collaborative efforts and identify their areas of focus in relation to climate change mitigation. I explained this at the beginning of the exercise, but one of the participants kept identifying regional and national efforts despite attempts to re-focus the discussion. The second factor was the same participant's monopolization of the conversation with details of these larger efforts that were not relevant to the intent of the exercise. After about fifteen minutes of repeatedly attempting to bring the discussion back to the task at hand I sensed the rest of the group was getting frustrated and I decided the best approach was to temporarily abandon the task and switch gears.

Outcomes from priorities and linkages discussions. The workgroup further refined the priorities and decided they wanted to work with the Sustainability Roundtable and GreenTools program, which is run by the same person. She was at the workshop and was enthusiastic about accommodating our interests. She committed to having the first monthly Roundtable of 2011 focused on our efforts and climate change mitigation. The following is a summary of decisions and direction from the workshop:

- Development of a King County cities cooperative and collaborative pledge and forum

  Pledge: King County cities pledge to work collaboratively with each other and the County to reduce regional sources of climate pollution. As part of the pledge, cities state which climate solutions they are working on or are planning to implement.

  Activities: Cities who take the pledge commit to working on their own efforts to reduce climate pollution as well as to participate in the Cooperative and collaborate

regionally to accomplish common goals. Some of the cooperative activities would include collaboration on pilot projects and funding opportunities such as:

  - Developing messaging and framing for climate outreach for elected officials, city staff, and the general public
  - Making a video
  - Collaborating on grant opportunities

Goal: The pledge would speak to the region as a whole and not the individual cities, and would be aligned with the climate change goals outlined by new Countywide Planning Policy.

- Full utilization and expansion of Green Tools Program to include focus on broader climate protection and sustainability

  Activities: Individual cities will complete the Green Tools roadmap and work towards implementation of the recommendations.

  - The County would establish a new GreenTools employee who will both expand the focus of the GreenTools program to more comprehensively address issues such as sustainable transportation options, clean vehicle efforts, community energy efficiency efforts retrofits, renewable energy projects, community outreach, etc. The staff could both develop and implement a focused program and/or directly work with individual cities on their sustainability related projects or programs.
  - The current interactive web-based GreenTools program would be expanded to include a page for additional climate change mitigation activities.

- Development of a technical expert program

Purpose: To serve as a resource for cities implementing climate protection and related sustainability strategies

Structure:

- Option 1: Technical experts located at the county who are on loan to support cities climate protection and sustainability projects and programs. The County could develop a list of all relevant technical experts on staff and negotiate a percentage of their time that would be available for outreach/advising for cities who have signed the pledge.
- Option 2: A vetted list of city and county recommended consultants with local experience and expertise on a diverse range of functions.
- Option 3: A pool of experts from many cities and the county, available to share.

- Puget Sound Energy Corps sustainability program hub

  Cities in Puget Sound hire Americorps Energy Corps volunteers to help implement their own energy related sustainability programs. Additionally, cities could chip in to have an Energy Corps volunteer coordinate a Cities Climate Collaboration pledge and collaborative effort.

Following the second workshop, I drafted a proposal and pledge with the recommendations in collaboration with the steering committee. The steering committee also began discussing how to fund the actions identified. A draft of the proposal and pledge was emailed to the workgroup a few days prior to the third workshop.

Workshop #3. The third and final workshop was held in another city's conference room. It was attended by the county lead, the ICLEI representative, a third party observer, and seven cities. The steering committee identified the following objectives for the workshop:

1. Review and refine proposal
2. Discuss funding options
3. Review and refine pledge
4. Identify next steps

For the first objective, the workgroup discussed the details of the proposal and agreed on some changes and additions. The final proposal is in Appendix D.

For the second objective, this was the first in-depth discussion of funding the proposal. We did not have any concrete numbers so we focused the discussion on funding sources and city budgets. We identified how much funding per jurisdiction was likely to be available, and where we might seek additional funds. The workgroup also discussed what they wanted to call this new collaborative venture.

The third objective of the meeting was to finalize the pledge. The discussion focused on the purpose and scope of the pledge. One of the city participants encouraged the workgroup to consider what this effort's unique purpose was and to formulate the pledge around that niche. The workgroup also discussed the importance of aligning the pledge with the proposal. The final pledge is in Appendix D.

The final objective was to identify what the next steps were. This was our final workshop and I had initially told the group that my participation would end after this workshop and after the proposal was finalized. I decided not to do that, however, as I had become invested in the process and felt that my continued leadership was necessary to initiate implementation of the proposal. I discussed this with the group and they agreed that I should continue with the process for as long as I was able to. We discussed transition of the facilitation role to the county lead upon my departure. We also identified an implementation committee to further refine the budget and

initiate implementation of the proposal.

At the end of the workshop I asked the workgroup to provide me with an assessment and feedback on the process. Following the final workshop, I emailed an assessment questionnaire to all the participants and then followed up with phone calls and in person meetings.

Outcomes of proposal and pledge discussion. The primary outcomes of this discussion were the refinement of the pledge and proposal. A summary of this is presented in the Results section below and in its entirety in Appendix D. The workgroup also decided to call this effort the King County Cities Climate Collaboration. Each of the words included in this name had significance to them.

Outcomes of next steps discussion. The group decided to form an implementation committee to follow through on the recommendations of the workgroup.

Steering/Implementation Committee. Two city representatives, the ICLEI representative, and the County lead all agreed to be on the steering implementation committee. The committee met three times prior to completion of my research with the intent to continue to meet monthly thereafter. The focus of the first meeting was to discuss funding opportunities, refine the budget, and discuss next steps for the proposed actions. The second meeting focused on strategic implementation and introduction of the Cities Climate Collaboration. The third meeting focused on developing the presentation for the launch of the Cities Climate Collaboration at the second Sustainability Roundtable of the year.

Sustainability Roundtable Strategy Team. Two of the actions were closely aligned with the existing Sustainability Roundtable process at the County. I had numerous conversations with the leader of this process to identify how we might integrate the current focus of green building with climate change mitigation. The existing sustainability roundtable strategy team asked if I

and the County lead would join them to discuss how these two efforts might co-mingle and enhance each other. The two city representatives from the implementation committee had already been appointed to the strategy team and the ICLEI representative was an alternate. As it turned out, all the members of the implementation committee were at the strategy team meeting.

Sustainability Roundtables. Traditionally, the Sustainability Roundtable was a bi-monthly meeting of the County and cities to focus on green building. It had achieved much success and popularity but was ready to expand its scope. The strategy team had been considering options when they became aware of our interests. For them, and us, it seemed like a good fit. The King County Cities Climate Collaboration and the Sustainability Roundtable Strategy Team decided they wanted to alternate monthly Roundtable Meetings between green building and climate change mitigation, so every other month would focus on climate action. The first Roundtable of the year was traditionally an overview of the coming year. To introduce the King County Cities Climate Collaboration I was asked to give a presentation at the January 2011 Sustainability Roundtable. I gave a brief overview of the case study, the proposal, and the pledge. The February 2011 Roundtable was the official launch of the King County Cities Climate Collaboration proposal and pledge.

Results

In this section I will present the findings and outcomes of this research process. In doing so, I will answer the research questions I posed earlier. I will also present a summary of the final proposal and pledge that were developed and discuss the actions already being implemented.

Challenges and needs. The first questions I asked during this process were meant to provide practical and necessary information from which to form a proposal for action. These are as follows:

- What are the primary needs and challenges of cities and towns implementing climate change mitigation actions?
- How can the County effectively help address those needs and challenges?

I first asked the cities and towns what their primary challenges and needs were in implementing climate change mitigation actions during the survey and interviews. We explored this topic further during our discussions in strategy meetings, workshops, and implementation meetings. The following is a summary of what I found:

Challenges.

- Decreasing resources during the current economic downturn makes it difficult for staff to devote time to climate change mitigation projects and programs. Climate change mitigation is not a current or pressing mandate and it is competing against other mandates that need to be met.
- The lack of political will from numerous elected officials does not provide the support or authority needed for some city's staff to take action. Some elected officials do not believe in climate change and some others are not willing to take action to address it.
- Many jurisdictions lacked internal coordination and consistency. Several jurisdictions had sustainability policies in their comprehensive plans that were not being noticeably implemented. Three jurisdictions were unaware that their current or previous mayor had signed the Mayor's Climate Protection Agreement.
- Most federal funds for transportation are for roads and not for creation of mass transit options. Changes need to be made at the federal level to support local efforts.
- Large-scale projects such as redesigning and developing new transportation infrastructure are very expensive.

- Addressing climate change mitigation requires a new area of expertise with which some jurisdictions are not equipped.

Needs.

- Stronger drivers from county, state, or federal agencies to influence local decision makers to take action.
- Locally relevant cost benefit analyses that illustrate the economic, environmental, and health benefits of climate change mitigation actions.
- Outreach and education to decision makers, staff, and the general public to increase understanding of concerns and issues related to climate change.
- Collaboration with the County, fellow cities, and other regional entities to increase motivation, develop regional strategies, and achieve economy of scale.
- Efforts to renew the Mayor's Climate Protection Agreement and track progress.
- Consistent sources of funding and/or incentives to implement mitigation activities.
- Readily available technical expertise to assist in designing and implementing mitigation projects and programs.
- Usable and reliable performance measures to assist program development and prioritization of resource allocation.

King County's role. One of the survey questions related to what type of assistance cities would find useful from the County. This question was also discussed in detail during the development of the proposal in the workshops. The findings from the survey and workshops on how the County can effectively help address the needs and challenges of the cities and towns in mitigating climate change are as follows:

- Provide technical expertise and coordination of technical programs.

- Provide leadership in collaborative processes rather than top-down edicts.
- Assist in developing and disseminating cost-benefit analyses, performance measures, and outreach and education materials for decision makers and the general public.
- Provide coordination and legitimacy for the King County Cities Climate Collaboration.
- Assist in developing regional policy for mitigation goals and programs.

Process results. While this region already participates in a number of existing collaborations and networks the workgroup identified a gap that this new effort could fill. There was not any existing network or collaborative effort focused on climate action that was inclusive of all cities and towns within the bounds of King County. Existing networks, such as ICLEI and the Mayor's Climate Protection Initiative, provide resources, camaraderie, and political legitimacy, but their scope is on a much larger scale. The workgroup wanted a collaborative effort that was focused more locally on the ground. Working in collaboration with King County government provides additional resources and local political legitimacy that can influence local decision makers within the municipalities.

Nine cities collaborated in a series of three workshops to develop a process and a plan in which all King County cities and towns can work with the County to promote and implement climate change mitigation. The following research questions were answered during the workshop process. These questions were designed to identify jurisdictions' priorities, preferred implementation methods, and benefits of a multi-jurisdictional collaborative process.

1. What actions are jurisdictions interested in working on? Which actions are appropriate for joint cooperation and collaboration?
2. What are the best ways to implement these actions? How do multiple jurisdictions effectively collaborate to share resources and expertise in climate change mitigation

efforts?

3. What are the advantages of multi-jurisdictional collaboration verses solo action?

Proposal summary. The overarching workgroup priority was to advance regional collaboration on climate solutions with the intent to raise all jurisdictions to a higher level of activity while also supporting a more resilient economy. This work supports the climate change policies developed by the King County Growth Management Planning Council. The proposal developed reflects a need for, and interest in, collaborating on solutions and sharing technical expertise, experience and resources. To further this goal of regional collaboration on climate solutions, the workgroup recommended the following:

1. Adopt the King County Cities Climate Collaboration Pledge.
2. Initiate and sustain the King County Cities Climate Collaboration.
3. Develop King County Cities Climate Collaboration Resources.

Priority actions identified. The following is an outline of initial priority action items identified by the steering committee and workshop participants. Concurrent and subsequent action items will also be developed by the participants as the process moves forward.

1. Adopt the King County Cities Climate Collaboration Pledge
   - 1.1 All cities and towns within King County will be encouraged to sign the pledge and participate in the King County Cities Climate Collaboration.
   - 1.2 The pledge will be introduced January 13, 2011 at a special Sustainable Cities Roundtable focused on climate.
2. Initiate and sustain the King County Cities Climate Collaboration
   - 2.1 Use the existing Sustainable Cities Roundtable as the mechanism to convene forums on climate related sustainability issues every-other month.

2.2 Engage as many of the 39 King County cities and towns as possible.

2.3 Include both presentations and discussions.

2.4 Focus the collaborative action on areas of outreach, coordination, solutions, funding and resources as identified in the pledge.

3. Develop King County Cities Climate Collaboration Resources: Support cities in climate protection efforts through in-person collaboration, an on-line center of technical resources, and potential support from Community Energy Action Corps members. The goal is to collaborate on sharing and developing resources and, as resources become available, potentially creating a climate resource center.

    3.1 Develop a directory of climate solutions related resources. This could include the following:.

        3.1.1 County technical expert pool. A list of relevant County technical experts on staff that already provide support for cities sustainability projects and programs. This could potentially be expanded by creating mechanisms for cities to directly contract with County staff to support implementation of city specific projects and programs.

        3.1.2 Technical experts from all participating jurisdictions that could help support other cities efforts, share local success stories, or potentially be contracted out to work with other cities.

        3.1.3 Technical experts from academia, research institutions, utilities, and other organizations.

        3.1.4 List of consultants with local experience and expertise on a diverse range of climate and sustainability related functions.

3.1.5 Best practices and lessons learned from relevant local projects and programs.

3.2 Host an annual symposium, or an annual symposium session track focused for city and county staff, on local climate solutions (Spring 2012)

3.3.1 Potentially a component of the Green Tools confluence, and/or possibly at other venues.

3.3.2 Provide a forum for all local technical experts – a broader group than those engaged in the Cities Climate Collaboration – to share information and best practices

3.3.3 Create opportunities for local governments to increase understanding and gather information on specific climate change mitigation efforts

3.3 Expand the King County GreenTools Program

Expand the GreenTools program beyond green building and sustainable development to include a focus on broader climate protection and sustainability efforts. Green building is one of many climate change mitigation strategies available to local governments. The idea of this action item is to expand this program to include additional climate change mitigation strategies. Steps to accomplish this include the following:

3.4.1 Establishing a new GreenTools staff person who would expand the focus of the GreenTools program to more comprehensively address issues such as sustainable transportation options, clean vehicle efforts, community energy efficiency efforts retrofits, renewable energy projects, and community outreach. The GreenTools staff could develop and implement a focused

program and/or also directly support implementation of individual cities on their sustainability related projects or programs.

3.4.2 The current interactive web-based Green Tools program would be expanded to include resources related to the broadened program.

3.5 Create a King County Community Energy Action Corps Hub (Summer 2011)

Cities in the King County region could develop a local Community Energy Action Corps program to help implement their own energy related sustainability project(s) or program(s). In hiring members to support their own efforts, local governments would also create a new regional workforce implementing climate and energy solutions and in doing so foster collaboration between cities, counties, and the AmeriCorps members.

3.5.1 Cities will consider hiring individual members or pooling resources to support one or more shared positions.

Pledge summary. The pledge outlines the intent, purpose, and focus areas of collaboration. The following language from the pledge illustrates the intent and purpose:

> We, the undersigned cities of King County, wish to work together to reduce regional and local sources of climate pollution. We believe that by working together we can increase our efficiency and effectiveness in making progress towards this goal. We are interested in achieving this goal in a way that builds a cleaner, stronger and more resilient regional economy.

The following priority focus areas of collaboration and action were identified:

- Outreach: Developing and refining messaging and framing for climate change outreach for decision makers, city staff, and the general public.

- Coordination: Collaborating on adopting consistent standards, benchmarks, strategies, and overall goals related to responding to climate change.
- Solutions: Sharing local success stories and challenges as well as cost/benefit analyses to support and enhance climate mitigation efforts by all partners.
- Funding and resources: Collaborating on securing grant funding and other shared resource opportunities to support implementation of climate related projects and programs.

The intent of the pledge and the priority actions is to implement climate protection solutions while providing tangible economic and health benefits for the county and cities, and their citizens. These benefits include:

- Increasing productivity and effectiveness of cities' climate mitigation and related sustainability efforts through sharing and coordination of local efforts;
- Expanding resources for climate related sustainability efforts through the collective pursuit of grants and other funding opportunities;
- Recognizing cities' sustainability efforts through shared marketing efforts;
- Improving public health through reduced air pollution and encouraging healthy activities;
- Reducing energy costs; and
- Supporting economic development and job creation.

Funding summary. King County agreed to fund and staff initiating and sustaining the King County Climate Collaboration for at least one year. This includes:

- Using the existing Sustainable Cities Roundtable as the mechanism to convene forums on climate related sustainability issues every-other month.

- Developing King County Cities Climate Collaboration Technical Resources as outlined in the proposal, and
- Expanding the King County GreenTools to include other climate change mitigation activities

The two remaining items that require funding, the symposium and the Energy Action Corps will need to be funded by the cities or grant sources. The implementation committee is planning to develop a strategy on how to achieve this.

Results of the Sustainability Roundtables. The introduction of the Cities Climate Collaboration at the January Sustainability Roundtable created a lot of interest from the participants. At the launch of the Cities Climate Collaboration at the February Sustainability Roundtable the City of Seattle and the King County's Executive Office committed to signing the pledge and participating in the effort.

Assessment of Process

Following the completion of the workshops I asked the participants to provide me with an assessment. I emailed this to them and then followed up with a phone call or in person conversation with each participant. Half of the participants completed the assessment. In the first portion of the assessment I asked the participants to rate the importance of different aspects to the success of the process to date. The aspects with the highest ratings were communication, coordination and planning, and convener/leader, followed by flat hierarchy and stakeholder diversity. The least important variable was written agreements, followed by interdependence. The compiled results of this assessment are below.

Questions on completed process. I asked the participants to rate the following based on their interpretation of how important these variables were to the success of the workshop and proposal development process.

Variable	Not Important	Slightly Important	Important	Fairly Important	Very Important
Stakeholder Diversity			1	2	2
Interdependence	1		2	2	
Flat Hierarchy			1	2	2
Written Agreements		1	3	1	
Communication				2	3
Coordination and Planning				2	3
Convener/Leader				2	3

In the second part of the assessment I asked the participants to answer questions on a Likert scale of strongly disagree to strongly agree on the proposed process going forward. The summary shows that the respondents strongly agree that the proposed process will enhance communication between cities and the County and will result in positive outcomes. They agreed that the proposed process will enhance their ability to implement mitigation activities, allow them to leverage resources, and ultimately reduce greenhouse gas emissions.

Questions on process going forward. I asked the participants to answer the following questions based on the proposal and pledge and the process going forward.

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
I believe that the proposed process will:					
1. Enhance my ability to implement climate change mitigation activities.				4	1
2. Allow me to leverage resources.				3	2
3. Enhance communication between cities and the county.				1	4
4. Result in positive outcomes.				2	3
5. Ultimately reduce greenhouse gas emissions.				4	1

I then asked a series of open-ended questions. The following themes emerged from the responses:

- The collaborative process has added value by connecting peers working on similar efforts, sharing knowledge, and finding commonalities and opportunities for future collaboration.
- Participants were motivated by having the opportunity to work together; to learn, share, and listen.
- All participants are looking forward to collaborating with other jurisdictions on climate solutions.

The full text of the questions and responses are below.

Open-ended questions.

1. *Has the collaborative process to date been valuable to you in any way? If so, in what ways.*
    - Yes, it has connected me with peers working on similar efforts in the region.
    - My jurisdiction is at an early phase of developing climate related programming and it was important to me to be at the table with other jurisdictions in the same place or already into implementation phases.
    - Each city has its own challenges in moving forward (i.e. lack of knowledge at staff level, lack of resources, decision-makers or management buy-off, etc.) and the collaboration has allowed the challenges to be discussed and for cities to find commonalities in where assistance is needed.
    - I certainly wasn't wholly aware of other cities' efforts so it was hugely informative as to what other cities are pursuing, through what means, and why. I also became much more

familiar with the names and faces of those working on similar issues as I, and would be much more comfortable contacting them for information, advice or assistance.

- Learning what other jurisdictions are doing to protect the climate. Building a collaborative process for future joint activities.

2. *During the process, were there any particular aspects that motivated or de-motivated you? Was there anything that excited or energized you, or anything that caused you to lose interest?*

- Depending on specific job responsibilities of the participants, some members desired very discrete and focused outcomes, whereas others approached the goals from a more integrated, big picture perspective.
- The interest and engagement of participants motivated me. This isn't exactly about the process, but it is a challenge to keep the faith when resources are so tight that forward progress is constrained.
- The ability to self select motivated me to take part and be productive at meetings as a representative of my workplace.
- I was motivated to hear the findings of the survey.
- Some of the energy/excitement extends from being at the table with a broad group of workshop participants to learn, share, and listen about their experiences to date.
- Other energy/excitement comes from the fact that this is unique in the country (county-cities trying to work together). I don't think my interest waned as this was a fair amount of time commitment for the work to be done.
- I was worried some times that we were creating a process that would burden my time commitments more, though I don't think that will be the case. Also, "green topics" are

increasingly competitive – it is hard to find your niche and lever to not only say something new, but more importantly do something new that will make a real difference. Meeting other representatives excited me though. Hearing their efforts excited me. Also, coming up with ideas together excited me. I think meeting several times was really helpful; I could laugh and joke with more of the participants by the end.

3. *Do you have any suggestions on how this process could have been improved?*
    - Sometimes we could have more efficiently pushed through discussions that were going a bit off track
    - Possibly provide sharing time to discuss how participants are providing the workshop developments with supervisors. This was not a top-down process, and as a more group-directed collaborative process it isn't always clear on where discussions will lead from meeting to meeting.
    - Provide printed copies of PowerPoint's, graphs, charts, etc.
    - That's a hard one. It's hard on one level because it's just the cities right now. I would have liked more than one King County representative in there on a regular basis. Or, someone from the state. It feels very grassroots-among-staffers, which on one level is great, but we usually don't have much power – and certainly that doesn't make us seem glamorous, the most informed, or delectable as a body that elected officials might want to join. It will make it harder to convince elected officials that it is to their benefit to participate.
4. *What aspect(s) of the proposed process going forward are you most interested in?*
    - Collaborating between the cities and county on climate solutions.

- Collaboration with cities and county, opportunity to share and leverage resources, and providing an educational forum and tools to inform my city's work on the issue.
- Collaboration on resources, products and projects. Gaining expertise 1) to determine product life cycle effect on climate; and 2) to compare the results of various methods of conducting jurisdictional and community greenhouse gas inventories.
- It's collaborative nature; the feeling that we may all be working together, and joint messaging and grant applications for projects.

5. *Are there any aspects of the proposed process you are concerned about?*
    - Focusing on the pledge compared to getting the collaboration up and running.
    - Each city is at a different phase in creating climate programming and some may not see the need right now for a pledge or taking part. But I believe the workshop has developed a viable proposal that isn't dependent on stage of program development or decision-maker concerns. The proposal also could be adopted at the programmatic/staff level if not accepted at the political level.
    - With increasing workloads, the ability of jurisdictional staff to participate.
    - As a small city, we can sometimes get left out of the loop. Fair distribution of resources and benefits, I guess; time commitments, if I'll get over-committed; if we can get enough people to join, that the effort will be substantiated by enough signatories and bodies to be legitimized and effective.
6. *Is there anything else you would like to add about the completed portion of the process or the process going forward?*
    - Thanks for your leadership on this effort.

- The personnel structure seemed important, with a facilitator not government affiliated and assisted by a steering committee of ‘specialists’.
- You did a very good job, and I’m glad you focused on the regional climate protection problem.

Assessment summary. Based on the assessment, the most significant findings are that the participants highly valued the opportunity to connect with their peers and work together towards shared goals. This opportunity provided them with the venue and process to develop relationships, strategize on joint solutions, and share resources. Most importantly, it catalyzed energy and interest and motivated individuals to participate in and continue with the process.

Conclusion

These findings from this Participatory Action Research illustrate the process undertaken to engage participants, develop a strategy and plan, and begin implementation. It provided answers to the research questions seeking to understand the needs, challenges, and interests of King County cities and towns, and seeking to expand understanding of the role and outcomes of collaboration. These questions and findings will be discussed in detail in the following chapter.

Chapter VI: Discussion and Interpretation of Findings

Introduction

Participatory action research historically is used in community contexts outside of government for creating social change. It is often associated with oppressed or indigenous populations, but is also widely used in educational research and human geography. On occasion, community collaboration efforts will be inclusive of government, however, there are few documented Participatory Action Research projects focused solely on empowering government employees to take action. There are also few focused on climate change mitigation. This study is unique in that it works strictly within county and city governments to empower government representatives to take action and influence change in the realm of climate change mitigation.

I came to this project through my previous work with local governments and my understanding of the capacity they encompass for change. Local government is where actions and policies are implemented. It is also where many of the problems associated with climate change are generated. In addition, from my experience in environmental sustainability work, there is a tremendous amount of passion and dedication among local government staff.

The constructs of this study – Participatory Action Research within local government – seemed like a natural fit to me. In my work with local governments in the past I have seen tremendous progress made in short periods of time through collaborative voluntary projects. Much of this work was not sanctioned by the formal authority of elected officials, but was rather engineered and justified by staff members. Their intent was either to achieve progress by flying under the radar or through developing a comprehensive plan or program and creating a constituency prior to formal approval, with the intent to use the pressure of some aspect of the community to acquire the budget approval needed for implementation or further action.

Interpretation of Findings

The success of this project to date has surpassed my expectations, as well as those of the many of the participants. The King County Cities Climate Collaboration program developed in collaboration with King County and nine cities has now been adopted and funded by King County and embraced by the cities that participate in King County's Sustainability Roundtable program. The ICLEI representative whose job is to work with local government on climate change mitigation said "I've never seen a project or program like this take hold so quickly." I believe the primary reasons for this accomplishment are its bottom up approach, the draw of climate change work, and the synergy and seeming spontaneity of complex adaptive systems.

Bottom-up approach. I have found, somewhat surprisingly, that most of the participants in this process have never been involved in a true bottom-up change process within their professional roles. I think the attraction to this approach is the feeling of activism, involvement, and implementing practical solutions. Most public government structures are fairly rigid and hierarchical. There is generally a tremendous amount of accountability procedure that needs to be followed, often creating a bureaucratic abyss where good ideas and passion are diffused and abated. There is a sense of satisfaction gained when we can see tangible fruits of our labor. It provides meaning to our work and a sense of purpose to our psyche.

I think part of the appeal of this project was the feeling of breaking out of the bureaucracy. It was an opportunity to think freely and take action without, necessarily, approval from above or within. Being associated with the County also gave them a sense of external authority, providing some cover in case things went badly and they needed a scapegoat, but also providing legitimacy to their efforts. It gave participants a feeling of importance, that their ideas were good and could create positive change. The approach used was critical to the success of the project. The

participants saw that they were creating the process and developing the plan of action. It was not someone else telling them what they could do, it was them designing what they needed. They saw real value and they had a vested interest. The process provided meaning.

Synergy and spontaneity. During the Sustainability Roundtable the County lead discussed this as an 'organic' process that continued to evolve and expand. The process brought together several individuals who had never met before, but who all had expressed understanding of the need for change, and interest in working with others to create it. The interaction between these agents combined to create an effect greater than any of them could create on their own.

Through the non-hierarchical collaborative process, an open and safe environment was created. Participants were given voice and respect and each contribution was valued and considered by the group. There were not any bounds placed on the participants in relation to what they could create. It allowed them to dream, to make manifest their ideals. This created a fantastic energy that attracted others outside of the process, which brought in additional energy and resources and allowed the proposed actions to expand and continue to grow and change. This virtuous cycle was initiated through a collaboration that developed organically and provided great meaning to those involved.

Draw of climate change work. Most everyone in the environmental field is intrigued by climate change work. It is vast, inter-disciplinary, challenging, and provocative. It is still novel and provides enormous opportunity for learning. It also provides a new frame through which to approach sustainability. By addressing climate change systemically and comprehensively, we can transform our societal systems to work synergistically towards a healthier environment, economy, and society. For many, it is out of reach, or appears to be so. National and international governments are struggling to identify agreeable, implementable, and meaningful solutions. This

process brought it in reach. It provided the platform for localized action on an immense and complex problem.

Further Analysis

This research achieved its purpose of developing a unique type of multi-jurisdictional cultural transformation to further climate change mitigation, and has validated the ideas put forth that a non-hierarchical collaborative process can be an effective method to catalyze motivation, action, and commitment. This section will provide further analysis of the results and outcomes and will expand on existing theory. It will also answer the final research questions designed to further understanding of how to catalyze interest, action, and commitment at the local government level.

Collaboration, motivation, and change. This research project was centered on the idea that collaboration is an effective motivator for change. In the following sections, I will discuss supporting theory for this idea and my own personal experience in implementing change in the context of the research findings.

As discussed in Chapter II, there is much in the literature espousing the benefits of collaboration in organizational development and change processes. Collaboration is shown to promote dissemination and creation of knowledge and self-organizing and entrepreneurial activity in private industry (Covin & Miles, 1999). This research has supported these ideas and expanded on them to incorporate work within government agencies.

Efficiency and effectiveness. Collaboration can improve efficiency and effectiveness by expanding the wealth of thinking. It allows insights from more individuals and, subsequently, a broader range of perspectives (O'Toole, 1999). In organizations, it can "allow for the natural creativity and the tacit knowledge of their members to be fully employed" (Peat, 2008, p. 141).

This is quite different from a hierarchical structure where the leaders provide direction and the individuals implementing the actions, or that are directly affected by the actions generally do not have a say in what is done or how it is accomplished, even though it is precisely these individuals who could provide useful knowledge of what needs to be accomplished and what will work. Collaboration provides for the opportunity to utilize both reason and intuition, usually resulting in more efficient outcomes (Salk, 1983).

This research process created linkages that did not exist. It created communication pathways and increased knowledge. It developed a plan of action that is currently blossoming and expanding to other jurisdictions. By utilizing the intelligence, knowledge, and energy of all participants, concrete actions were developed and began implementation in a short period of time. In the assessment, the participants identified communication, coordination, and planning as significant components leading to the success of the collaborative process.

Motivation. One of the research questions was: Is collaboration an effective motivator for change? The results of this research clearly showed that the idea of collaboration itself was one of the primary motivators for participants to engage in the process, and to stay engaged. The results of the assessment also showed that participants perceived that a flat hierarchy was a substantial contributor to success of the process. There is a perception in most hierarchical top-down organizations that people at the top are smarter or better, which can create a sense of less value of staff in lower positions, and consequently undermine motivation. Previous research in this field shows that collaboration is a driver of motivation. People are interested in participating in a process or embracing a vision if they are listened to and their visions are accommodated and integrated. Buy-in can be achieved through genuine inclusion. People who have participated in developing a plan of action are more likely to implement it (O'Toole, 1999).

Commitment. Another research question was: How can you gain a sense of commitment? As the findings from the assessment and research illustrate, the participants are committed to the process. I am still receiving emails almost daily from the participants asking what the next steps are, keeping me informed of what they are doing, and confirming their commitment. They are excited about this process and want to keep moving forward.

The social network theories discussed in Chapter II illustrate that networks and collaborative social systems build trust and relationships. People generally feel a strong sense of commitment to the people involved. These types of networks are superior to hierarchical structures for sharing knowledge and innovative thinking. "The information passing laterally through them has credibility" and provides a safe context in which to experiment with new ideas (Senge, 1999, p. 49).

Commitment through collaboration also comes from a strong sense that it matters. No one is telling an individual what to do. They are choosing to take personal action because it is important to them. They internalize this and it can transform into passion and drive. "People's enthusiasm and willingness to commit themselves naturally increase when they realize personal results from a change initiative; this in turn reinforces their investment, and leads to further learning" (Senge, 1999, p. 47).

In the instance of this research project, commitment was gained by each member becoming personally involved and having the opportunity to develop programs that were important to them. It was also fostered by building relationships with the other participants and feeling a sense of commitment to each other. I have only known the individuals I have worked with during this process for a period of four to eight months, and yet we have become respected colleagues and in some cases friends.

Intervention. Action Research is a form of intervention in cultural evolution (Eisler, 1987). It seeks to transform the governance structure from one of domination and top down decision making to one of partnership and collaboration. It is particularly relevant for this type of study in that a transformation of this nature would likely bring with it a shift in "technological direction: from the use of advanced technology for destruction and domination to its use sustaining and enhancing human life" (Eisler, 1987, p. 196).

In answer to the research question: Can an intervention of this type be a good way to catalyze interest and action? I would say yes, certainly, for the reasons given above, but also because of the obvious interest and action this project generated. Nobody was required to participate, it was all voluntary. A few of the participants "flew under the radar" in that they did not specifically ask permission of their directors or elected officials to participate. Also, the fact that most of the recommendations developed during the project are being funded and implemented is a clear indicator that this intervention was successful at catalyzing interest and action.

Personal Experience

In my professional work as a state government employee, I have led numerous efforts in partnership and collaboration with local governments, state and federal agencies, tribes, institutions of higher education, volunteers, environmental organizations and scientists. The spectrum of my work has focused on environmental sustainability, including protection, conservation, and restoration. My role in that spectrum is developing, influencing, and implementing policy and governance structures; facilitating development and funding of plans, programs, and projects; and assisting partners in realizing progress on shared goals.

I have achieved great success in previous change efforts through collaboration with partners. The components I have found most useful in achieving success are as follows:

- Building relationships and trust

  I have found this to be the number one factor to success. As I get to know people and earn their respect, their willingness to work with me increases and their trust in me grows. This increases the likelihood that the ideas for change I propose will be thoughtfully considered and accepted.

- Facilitating a ground-up process, rather than providing a top-down edict

  Although I come to each change process with ideas on what I would like to see happen, I do not force these ideas on anyone. I always seek interest and request participation. I clearly lay out my objectives and ask participants for their input, and then modify the objectives based on that input. This facilities buy-in to the process and the results. I provide guidance through facilitation, but I take direction from the group I am working with. This is not always easy, as I usually have persons of authority that I must answer to, but I have found this imperative for a successful outcome.

  One of the challenges that persons of authority sometimes have with this approach is giving up control. What they sometimes do not realize is that without buy-in from the participants, they only have an illusion of control. My experience with top-down edicts is that they rarely realize the full potential of their purpose. Unless there is buy-in, individuals or agencies that are required to implement them will often do what it takes to meet the minimum requirements, but will rarely comprehensively implement the systemic changes needed. This is not to say that mandates do not have their place, as they clearly do when it comes to matters requiring regulatory authority, but they are not conducive to creating social change from the bottom up.

- In-person meetings and frequent and clear communication

For my work I utilize numerous forms of communication, including in-person meetings, emails, and phone calls. While conference calls and webinars can be useful for conserving resources, they are not as effective for building relationships or commitments as in-person meetings. I primarily utilize email communication as a follow-up or in preparation for in-person meetings, or to provide reminders or clarifications.

- Having some type of legitimate authority

Through my experience working in this field I have found that being associated with some entity of authority greatly influences people's willingness and level of interest in participating in a change process. It gives the participants a sense that what they do matters and will make a difference. It also increases the likelihood of implementation.

The quality of the authority is also important. A well respected authority will likely have greater influence than one that is less respected. As a state government employee I worked for two separate agencies, both with the same mission and mandate. The first was a highly respected cabinet agency in the Governor's office that focused on collaborative processes. The second took a more command and control approach and was not as well respected, and in some cases seen as ineffectual. As an employee of the first, I was granted access to almost any meeting I wanted to attend and given audience with almost every body of elected officials. I was asked to give presentations and speeches at numerous events and frequently interviewed for newspaper and radio stories. As an employee of the second, my access was greatly limited. When dealing with groups that had not previously worked with me, I was often met with suspicion and found it somewhat difficult to get on meeting agendas and appointment calendars. The requests for presentations and appearances also declined.

I used this personal experience, as well as knowledge gained from the literature review, in developing and facilitating this process. I focused on developing trust and relationships with each participant and assisting participants in developing relationships with each other. I stayed true to a bottom up process and a flat hierarchy, which I believe influenced the buy-in of the participants. We had frequent meetings and I provided clear and consistent communication.

One of the most important strategies I used in designing the process was to align myself with a legitimate authority. I think the partnership with King County was a critical component to success of this process. Rather than a researcher coming from the 'outside', I was perceived as an associate of King County. In the participant assessment, convener/leader was identified as one of the top contributors to the success of the project. I attribute that in part to the legitimate authority I gained by aligning myself with King County, and to the ground-up approach that I embodied through facilitation.

Fostering climate action in a local government setting.

Alternative local government setting encouraging collaboration and change. This study identified strategies that can be implemented in typical government settings to create the potential for change and give voice to government staff members who have an interest in such actions. Strategies developed based on collaborative and Participatory Action Research theories discussed in Chapter II, and personal organizational change experience, were successfully utilized to enhance motivation to change, give meaning to work, encourage sharing of resources, increases willingness to take risks/experiment, and enhance the possibility of sharing models that work. This Participatory Action Research study provided an informal test of how notions of bottom up collaboration and organizational change can establish cross-jurisdictional structures

and foster increased coordination and climate change mitigation activity level in a typically hierarchical environment.

Participatory Action Research: A collaborative change strategy. The primary change strategy utilized in this research project was top down support and bottom up action. The bottom-up multi-city and county collaboration strategy based on the theoretical framework and developed during this research project has served to build trust, foster innovation, and is providing the opportunity to create comprehensive systemic solutions that increase efficiency and effectiveness. This was achieved by employing methods from Participatory Action Research and from successful organizational change efforts in my own professional practice. Several of these methods are similar to Kotter's (2007) "Eight Steps to Transforming your Organization". These are discussed within the framework of Kotter's eight steps below:

1. Establishing a sense of urgency. This is Kotter's first step. This step was already completed prior to the initiation of the research project. The participants had a shared understanding of the urgency of climate change action.
2. Forming a powerful guiding coalition. This was accomplished through four methods. The first was acquiring the support of the County government. The County support provided legitimacy for the effort and in the end also contributed resources. The second was composing a steering committee of the County's climate action coordinator, the local ICLEI representative, and three city representatives. The third was voluntary coalition building. This optional process was open to any King County city or town that wanted to participate. The fourth was utilizing an outside facilitator without formal authority.
3. Creating a vision. The steering committee developed, and the workgroup approved the guiding principles, which stipulated the intent for a collaborative process focused on

mitigating climate change to achieve economic, human health, and environmental benefits and to promote long-term sustainability. The effort also focused on sharing scarce resources in future.

4. Communicating the vision. The vision was communicated during the workshops as well as in the pledge that was created.
5. Empowering others to act on the vision. Numerous strategies were employed to achieve this vision, such as giving participants a voice in a supportive setting and encouraging them to share ideas and develop the process and recommendations. The guiding principles provided the framework for each entity to have an equal voice in shaping the effort and for everyone's participation and input to be valued and respected.
6. Planning for and creating short-term wins. Several short-term wins were created during the process, such as the expansion of the Sustainability Roundtables to incorporate the new climate mitigation focus, and recognition of successful climate mitigation efforts already achieved. The case study provided numerous examples and highlights of current activity and achievements within the County.
7. Consolidating improvements and producing still more change. The agendas for the bi-monthly Sustainability Roundtables were developed to increase awareness of the issues surrounding climate change and the opportunities for climate action. The development of technical resources will enhance jurisdictions' abilities and to implement mitigation projects and programs.
8. Institutionalizing the new approaches. The development of the King County Cities Climate Collaboration and the corresponding pledge will assist in continuing the process and implementing the recommendations.

This project achieved success largely because of the following factors:

- Government staff members were committed and sensed the need for change. This opportunity gave them the vehicle to create change.
- The surrounding environment is progressive and largely supportive of these efforts.
- It was completely voluntary.
- There were no controlling policies.
- There was no controlling jurisdiction or leader. It was a non-hierarchical process that allowed creativity and gave people voice.
- It had legitimate support from the County.
- It provided an opportunity for government staff members to join together with others who shared similar commitments on climate change.
- It enhanced sense of meaning in work by working together with others and creation of follow-on activities.
- It created a commitment to share resources to overcome lack of available resources

Praxis of change. This research project built on the theory of confluence of local climate action and politics discussed in Chapter II, and added bottom up collaboration to create change. When these three forces were brought together through Participatory Action Research – bottom-up collaboration, local climate action politics, and relevant aspects of local activities – a praxis of change was created that promoted locally based climate change mitigation activity. The success of this effort illustrates that the effectiveness of locally based climate change mitigation activities can be improved when implemented in a multi-disciplinary manner in a local geographic region defined by the reach of county planning, local utilities and organizations, and collaborative efforts.

The success of this project confirmed that an effective method to achieve a comprehensive multi-disciplinary approach to climate mitigation efforts involving governmental agencies is to utilize bottom-up collaboration. This implies that this theoretical framework and the associated strategies and process developed could be replicated in other areas where there is interest and support for climate change mitigation.

Reflections on improving the process. Upon reflection, there are a few things I would do to improve the process. During the first and second workshops, the results of the dot exercise could have been improved by not allowing everyone to place as many dots as they wanted on any specific idea. I realized after I had done this that it could skew the outcomes. Because we had in depth discussion about the priorities and clear buy-in I felt comfortable that we had successfully identified the priorities. The next time I utilize this process, however, I will give each participant two or three colors of dots, each color signifying a different level of priority, and I will ask them to place only one dot per action.

During the first workshop the comments of two participants regarding the creation of a network were in contrast to the priorities identified by the dot exercise. These comments, however, swayed the group into slightly shifting direction. I think the two participants spoke with such conviction that the others just went along. If this were to happen again, I would strongly advocate for the position of the majority and make sure that everyone is on board with the direction.

During the second workshop the discussion got off track. There are two things I would do differently in this situation. One would be to prepare additional materials ahead of time to help the participants understand the purpose of the exercise. The second would be to spend additional

time and effort explaining the purpose and making sure everyone understands it prior to initiating the exercise.

Researcher's Continued Role

My original intent was to complete my work on this project after the proposal was complete, however, I have chosen to continue working with this project and the people involved during the initial implementation phase. I am doing this for two reasons. The first is that I want it to succeed because of my personal involvement, and the participants' involvement in it, and I think my continued involvement will improve the chances of it doing so. The participants agree with this conclusion. If it fails it will feel like we have wasted our time. I do not want to waste my time or anyone else's. The second reason is that I think it is important work. Climate change mitigation is an area of societal action that needs to be drastically increased and I think that this process is one of the vehicles that can help meet the demand.

Implications of Study for Future Action and Research

I hope that this study will influence governments and organizations to employ non-hierarchical collaborative practice in developing programs, policies, and processes, and that they find success in doing so. I also hope that this county-city model is replicated in other regions to forward climate change action. I have successfully utilized similar methods in previous work but did not examine the theoretical underpinnings or comprehensively analyze the results. This project has allowed me that opportunity and I will utilize the learning from this in future work.

During the course of the Participatory Action Research and the case study, many questions were generated that might be suitable for further study. These include the following:

- A comprehensive survey and analysis of land use and transportation planning within all 39 cities and towns in King County, in collaboration with King County and the Puget Sound Regional Council.
- A comparison of the aggregate level of climate change mitigation activity within the borders of King County compared to other counties or geographic areas. This could also include a study of style of urban governance and a comprehensive analysis of what is driving climate change activities at the local level.
- A look at how collaborative action in climate change mitigation is impacting and changing traditional approaches to state, national, and global environmental politics.

Conclusion

Climate change mitigation by its very nature requires collaboration. It is a complex, systemic, multi-faceted, global concern. It affects and is affected by almost every aspect of our society, from the food we eat, the air we breathe, and the home we live in, to national economic security, global power struggles, and the inequity of resources between developed and developing countries. Comprehensively addressing climate change will require compassion, integrity, and perseverance. It will also require regulations, incentives, and innovation. Most importantly, it will require a shift in how societies function that to date has not been accomplished on a global scale. It will require a shift to sustainability.

Sustainability is not a new concept; it has been around as long as humans have inhabited the earth. Society after society has failed due to resource depletion, drought, and even climate change. The good news is that some relatively isolated societies have figured it out and survived, some as long as 40,000 years. We can stop emitting greenhouse gases and still have a well functioning society, and some say even a better society. A society in which the full social and

environmental externalities of our actions are measured and considered, where equity becomes a driving foundational value, and where quality of life is measured in happiness and health rather than material possessions.

APPENDIX

Appendix A: City Profiles of Highly Active Cities

Accomplishments of twelve of the most active King County cities are outlined below; these cities have completed a GHG inventory, or are in the process of completing one, and have established some type of greenhouse gas emission reduction goal or policy. Three quarters of them have established an interdepartmental green team to coordinate and implement sustainability policy, and half of them have also developed a climate action plan.

Seattle

Seattle is the oldest and largest city in King County with a population of 602,000 and a land area of 55,078 acres. It is also the most progressive in many aspects of climate change mitigation including promotion of federal and state policies that focus on climate solutions, fostering the Mayor's Climate Protection Agreement throughout the US, being actively involved in the county-wide Growth Management Planning Council, and operating the nation's first carbon neutral electric utility.

Goals and achievements

The Seattle City Council has adopted the goal of making the Seattle community "carbon neutral" – meaning that it would have no net impact on the climate – which is the most aggressive goal in the region. Seattle has already surpassed its first benchmark goal, in alignment with the Kyoto Protocol, of a 7 percent reduction below 1990 levels by 2012. It has also achieved a per person carbon footprint reduction of twenty percent from 1990 levels. These accomplishments were achieved while the population grew 16 percent (City of Seattle, 2009). The city's next benchmark is to achieve a 30 percent reduction below 1990 levels by 2024, followed by an 80 percent reduction below 1990 levels by 2050.

Systemic Sustainability Planning

Internal coordination and collaboration.

The Office of Sustainability and Environment oversees implementation of the City's climate protection initiative, urban forest management, and other related sustainability practices by collaborating with city departments and the community. This coordination is crucial to the level of success achieved.

Climate action plans and GHG inventories.

Seattle has conducted consistent community-wide GHG emission inventories since 2005. It has also developed and actively implemented a Climate Action Plan that encompasses broad-ranging strategies such as focusing on fewer and cleaner car trips, promoting growth in urban areas, and energy efficiency measures. Seattle is in the process of collaborating on an exciting new GHG inventory project in partnership with the King County and the Puget Sound Clean Air Agency.

Tree canopy protection

Seattle's Urban Forest Management Plan was developed to preserve existing trees and plant new trees. The plan's goal is to plant approximately 650,000 new trees and reach a thirty percent canopy cover in 30 years. A public tree replacement policy was adopted that requires the planting of 2 trees for every 1 tree removed. The city also has an Urban Forest Commission that meets twice a month to discuss issues related to protection, management and conservation of trees in Seattle. Current activities include research by the Cascade Land Conservancy, the US Forest Service, King County, City of Seattle, and the University of Washington to measure the current percentage and condition of the tree canopy.

Renewable energy

Seattle City Light actively promotes renewable energy generation. The utility currently has 175 megawatts of wind generating capacity and has an active biodiesel program for city vehicles. It also encourages generation of solar energy and currently owns three hydroelectric plants.

Environmental outreach and education

Seattle Climate Action Now (http://www.seattlecan.org/) is a city led effort that partners with businesses and organizations throughout Seattle to make progress on climate action. It has provided numerous web-based outreach materials to inform the community and encourage involvement in climate change mitigation activities. It have also recently developed the web-based Climate Action Outreach Toolkit for local governments and organizations. The toolkit provides materials to initiate a climate action campaign, develop e-newsletters, and create press releases. To engage the community Seattle also coordinates the Seattle Summer Streets program that closes streets to traffic and opens them to pedestrians and bicyclists for a day of educational and fun climate change mitigation related activities.

Performance measures

Seattle utilizes numerous performance measures for climate protection strategies, including the following:

- Energy use
- Rate of recycling
- City fleet fuel reduction
- Number of commuters using mass transit vs. single occupancy vehicles
- Community-wide carbon footprint every three years
- Individual business and residential carbon footprint calculators

- Seattle Built Green Portfolio, which identifies and measures the effectiveness of sustainable development practices.

Efficiency measures

Energy efficiency

Seattle City Light has a net zero emission status, in part due to energy efficiency strategies. One of the utility's goals is increase the efficiency of buildings by at least 20 percent by 2020. The City is also requiring a 30 percent increase in energy efficiency for all new buildings. They have also launched a Conservation Action Plan for residential and commercial customers. The Home Energy Audit program will perform 5,000 audits to Seattle City Light customers and provide Energy Performance Scores.

Water conservation

Seattle participates in the Saving Water Partnership and provides educational materials to residential and commercial customers for water conservation. Seattle Public Utilities' goal is to reduce overall water use by 15 million gallons a day by 2030.

Waste reduction

The Zero Waste Strategy is an aggressive program to reduce waste with a current goal of 70 percent waste reduction by 2025. Recycling and composting has increased over fifty percent since 2001 and recycling and compost services continue to be expanded. The newest addition in 2009 was the expansion of the food waste/compost program to include meat, fish, and dairy products. The strategy also includes increased recycling of construction and demolition waste.

Green building

The Department of Planning and Development has developed the Priority Green program to expedite review of green building projects and provide priority review for innovative projects

that might not fit within the existing code. City Green Building has also developed an Incentive Fact Sheets to assist developers. The city is also conducting a Living Building Pilot Program to assist projects and allow flexibility for developers that are striving to meet the requirements of the Living Building Challenge, which is an international green building rating system.

Transportation

Electric vehicle infrastructure

An electric vehicle network will be installed throughout the city primarily in homes and workplaces. Some charging stations will also be located at shopping malls, movie theaters, and parking garages. Seattle is also working to electrify buses, light rail, and streetcars. A 14-mile electric light rail link of a planned 55 mile line was installed in 2009. In 2007, the South Lake Union Streetcar went electric, with more electric streetcars planned for the future, and there are 146 electric trolley buses.

Municipal green fleets

The city's long-term goal is to have a 100 percent green fleet. Towards this goal, the city has transitioned most of its vehicles to hybrid, electric, or compressed natural gas and converted its diesel fleet to an ultra-low sulfur diesel and biodiesel. Segways are also being used for short distance operations.

Commute trip reduction

The city has complied with the state's commute trip reduction requirements, and has also provided numerous transit options, such as light rail, streetcars, and the metro bus fleet. In addition, bicycling and walking are promoted through development of new safer bike lanes and walking paths. Seattle has also established a Ride Free Area where passengers ride free on any Community Transit, King County Metro or Sound Transit bus between 6 a.m. and 7 p.m.

Transit oriented development and land use

While much of the city is built out, the city is centering growth in urban centers and working to improve transit connectivity and develop a comprehensive network with bicycle and pedestrian options.

Challenges

Seattle has expended significant effort in addressing climate change mitigation but still has some challenges. A tighter budget and reduced staff time are at the top of the list for the City, as well as for most jurisdictions. Seattle is also highly urbanized and must work within the constraints of an urban setting.

Kirkland

Kirkland has a population of 49,010 and a total land area of 6,751 acres. It was named one of the top ten walkable suburban cities in the nation by the Wall Street Journal.

Goals and achievements

Kirkland has a comprehensive waste management program and has the highest recycling rate in the state. The City is a member of ICLEI and a signatory to the US Mayor's Climate Protection Agreement, and has adopted the following emission reduction goals:

- 10 percent below 2005 levels by 2012
- 20 percent below 2005 levels by 2020
- 80 percent below 2005 levels by 2050

Systemic Sustainability Planning

Internal Coordination and Collaboration

Kirkland has an interdepartmental green team with green ambassadors in each facility that help with internal outreach. The team assists in implementation the Natural Resource Management Plan, which provides a blueprint for climate change actions. It also serves as the Tree City USA board.

Climate Action Plans and GHG Inventories

Kirkland has completed GHG inventories and is implementing its Climate Change Action Plan.

Tree Canopy Protection

The tree retention ordinance in Kirkland is the most restrictive in the state on private and public land. The City is currently completing a canopy assessment to be used as a baseline for an urban forest management plan. They are also planning to purchase a software program that quantifies the environmental benefit of trees such as air quality and carbon storage.

Renewable Energy

Kirkland currently uses 50 percent renewable energy and is working up to 100 percent. The City is also considering developing geothermal energy sources.

Environmental Outreach and Education

The City conducts numerous forms of environmental outreach and education including providing extensive information on websites and e-newsletters, community events, and classes.

Performance Measures

Kirkland currently tracks energy use in all departments; vehicle gas use; and community recycling rates. They are also planning to track tree canopy once the baseline is established.

Efficiency Measures

Energy Efficiency

The City has installed energy efficient street and traffic lighting and has reduced operating costs. It is tracking facilities energy consumption and converting HVAC systems. 12,500 residents are participating in the Home Energy Audit program in coordination with C7 cities.

Water Conservation

Kirkland utilizes numerous water conservation measures and tools, such as:

- Recycled chips and compost for mulch in City parks to reduce water use.
- Purchased water rights to draw water from Lake Washington for park irrigation.
- All filling stations within the City are required to use reclaimed water.
- Partnership with Cascade Water Alliance to provide incentives to residents.

Waste Reduction

Utilizing the Preferred Pumper Program, Kirkland has become a leader in reducing the disposal of fats, oils, and grease. They are also involved in decant partnerships, recycling waste to usable resources, such as converting asphalts into concrete.

Green Building

The City offers expedited review for green building projects and is in process of updating the codes to adding incentives that encourage the use of solar and energy efficiency designs.

Transportation

Electric Vehicle Infrastructure

Seven charging stations are planned for installation in 2011 at five locations. Kirkland is a member of the Clean Cities Coalition that promotes energy security and environmental health.

Municipal Green Fleets

Kirkland is a member of the Evergreen Fleet Initiative. It has an extensive green fleet that includes hybrids and biodiesel vehicles.

Commute Trip Reduction

The City is creating a transit center to increase bus use through a partnership with Sound Transit. They also subsidize city employees' transit commute costs.

Transit Oriented Development and Land Use

Kirkland is working to develop a lightrail station and is focused on developing compact walkable communities utilizing, cottage housing, in-fill, and the complete streets program. The City is also actively involved in the county-wide Growth Management Planning Council.

Challenges

As with many jurisdictions, budgetary constraints are the most significant challenge. Most staff members are working at capacity to fulfill the city's many obligations and it is difficult to take on new programs and projects.

Redmond

Redmond is situated on the north end of Lake Sammamish and along the Sammamish River. It has a population of 51,890 and a land area of 10,388 acres and is home to Microsoft.

Goals and achievements

Redmond is a highly active city in the realm of sustainability and long-term planning. The City's comprehensive plan is currently being updated with sustainability as the main organizing principle. Redmond is involved in the county-wide Growth Management Planning Council, is a

signatory to the Mayor's Climate Protection Agreement, and recently became a member of ICLEI. Some of the City's goals include:

- Reduce water use 1.6 percent by 2012
- Increase single family recycling rate to 70 percent by 2012
- Require all new development to be green by 2012

Systemic Sustainability Planning

Internal Coordination and Collaboration

The City has an interdepartmental green team with sub-groups that focus on specific sustainability issues.

Climate Action Plans and GHG Inventories

The City completed GHG inventories for city operation in 2008 and 2009. The first community GHG inventory is underway and will be completed in 2011. The results of the inventories will help to identify future efforts and activities and provide a baseline for the development of the Climate Action Plan and emission reduction goals.

Tree Canopy Protection

The Community and Urban Forest Plan was adopted in 2009. A tree canopy assessment is scheduled for 2011.

Renewable Energy

Redmond is currently exploring the possibility of a geothermal heating and cooling district in the Overlake area. The high school currently utilizes geothermal energy. The City is also updating policies to make sure there are not any barriers to alternative energy and have provided streamlined permitting for wind turbines and solar panels.

Environmental Outreach and Education

The City has a full-time natural resources public outreach staff member who provides outreach to schools and the general public through events, classes, and the internet. The City is launching a sustainability website and recently hosted an Eco Fair and a community meeting about sustainability.

Performance Measures

Redmond publishes an annual Community Indicators Report Card that measures level of activity and progress in the following sustainability related categories:

- Achieved vs. Allowed Residential Density
- Water Consumption
- Waste & Recycling
- Transfer of Development Rights Activity
- Environmentally Sensitive Urban Development
- Parks, Open Space, and Trails
- Land Capacity vs. Growth Planning Targets
- Growth in Centers
- Metro & Sound Transit Ridership
- Local Transit Service
- Commute Trip Reduction & School Bus Ridership
- Peak Hour Vehicle Miles Traveled (VMT)
- Traffic Growth
- Bicycle & Pedestrian Environments

The City Council is also interested in measuring level of GHG emissions once the carbon footprint is complete.

Efficiency Measures

Energy Efficiency

The City is initiating energy audits on some facilities and identifying several areas to reduce energy use through retrofits and upgrades.

Water Conservation

Redmond provides several programs and events to assist residents in conserving water.

- Spring Garden Fair and the Natural yard Care Program provides information and classes on the principles of natural yard card and outdoor water conservation.
- Sammamish Watershed Festival, which educates middle schoolers on watershed health and conservation.
- The Water Conservation Garden is a demonstration garden along the Sammamish River Trail.
- Irrigation system audits and upgrade rebates
- Clothes washer rebates, showerhead replacements, and water conservation kits in collaboration with Puget Sound Energy

Through its numerous efforts Redmond has consistently achieved outdoor water use reduction since 2003. Redmond's goal is to reduce water use by 1.6 percent of 2007 levels by 2012.

Waste Reduction

Single family residential recycling rates have increased to 64 percent, but multi-family rates are still at 16 percent. Redmond's goal is to increase single family rates to 70 percent and multi-family to 25 percent by 2012. For internal operations they were one of seven cities that received the 2010 King County Best Workplaces for Recycling and Waste Reduction award.

Green Building

By 2012 all new construction will be Built Green or LEED certified. The City currently provides expedited permitting for green residential building and is expanding the program to include commercial.

Transportation

Electric Vehicle Infrastructure

Redmond will be installing four electric vehicle charging stations in 2011 at City Hall and at the City's Maintenance and Operations Center. Redmond is a member of the Clean Cities Coalition that promotes energy security and environmental health.

Municipal Green Fleets

Renton is a member of the Evergreen Fleets Initiative and has several hybrid vehicles within the city fleet.

Commute Trip Reduction

Redmond has developed R-TRIP, an online program where commuters can record trips, earn incentives and rewards, track CO2 savings, and access commute resources. Incentives include a $50 give card and drawing for monthly prizes, vanpool subsidies, and a free one-month bus pass. The City achieved an 11 percent increase in commuters utilizing modes of transportation other than a single occupancy vehicle from 2003 to 2009.

Transit Oriented Development and Land Use

The transportation master plan is currently being updated with a focus on sustainability and transit oriented development. Redmond is making progress in achieving zoned density, which increases opportunities for people to live close to job centers and decreases dependence on transportation.

Challenges

The biggest challenges for Redmond are budgetary constraints and competing priorities for staff to implement projects and programs.

Shoreline

Shoreline is a fairly new city, formed in 1995. It has a steadily increasing population of 54,320 and total land area of 7,415 acres.

Goals and achievements

The goal of the Shoreline City Council is to create a sustainable community. To this end the City has developed an Environmental Sustainability Strategy that will add sustainability into the analysis for decision making and measuring progress. They are committed to reducing emissions through energy and water efficiency, commute trip reduction, and reducing solid waste. The City has achieved a 100 percent stormwater retention rate at the new LEED certified City Hall and is currently working towards a 60 percent recycling rate.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The Green Team is an interdepartmental team that serves as the hub to facilitate and coordinate implementation of the Environmental Sustainability Strategy throughout all departments within the City.

Climate Action Plans and GHG Inventories

A carbon footprint for the city was completed last year and the community inventory is underway. The City is a member of ICLEI and the Mayors Climate Protection Agreement and has developed a Climate Protection Campaign.

Tree Canopy Protection

Shoreline is currently completing a tree canopy inventory to identify a baseline for future planning. The City regulates tree retention and is a member of Tree City USA.

Renewable Energy

The City promotes the use of renewable energy through modeling the use of solar panels at the new City Hall building; purchasing recycled products; and promoting geothermal energy and electric vehicles. The City also purchases Green Power from Seattle City Light.

Environmental Outreach and Education

Shoreline's environmental outreach and education program focuses on modeling energy efficiency by conducting tours at the new LEED Gold certified City Hall, and providing information and tools for the community. They are working with the Bonneville Education Foundation to provide environmental education in the Shoreline School District. The City also hosts an annual earth day event and provides free products that encourage sustainability.

Performance Measures

Shoreline conducted an in-depth survey of resident's sustainability behavior and followed it with focus groups and advertising on buses. They also conducted workshops and asked participants to complete on-site evaluations, and followed up with a phone survey 18 months later to ascertain behavior change.

Efficiency Measures

Energy Efficiency

The new City Hall provides a model of energy efficiency utilizing natural lighting and a state of the art building envelope. At the annual Earth Day event the City provides a green building workshop with energy kits for participants.

Water Conservation

The City's Sustainable Yard Program provides education and products that promote water conservation. They are actively involved in the Saving Water Partnership and support and implement regional programs.

Waste Reduction

Shoreline has a current diversion rate of 58 percent with a one of the highest diversion goals in the County of 60 percent. They also encourage use of recycled products and full utilization of resources, such as requiring double sided printing.

Green Building

Shoreline greatly encourages Green Building with incentives and is considering mandatory requirements. They currently require utilization of low impact development where feasible for all new development.

Transportation

Electric Vehicle Infrastructure

The City of Shoreline participated in the regional Electric Vehicle Infrastructure Technical Advisory Committee to advise on the development of model ordinances and regulation. The City is considering installation of charging stations.

Municipal Green Fleets

One of the goals in the Environmental Sustainability Strategy is to require alternative fuel vehicles or for the city fleet.

Commute Trip Reduction

Shoreline provides bus passes for all city employees and is working to create town centers that encourage pedestrian traffic.

Transit Oriented Development and Land Use

Shoreline is currently in process of updating a major thoroughfare to increase pedestrian and bicyclist safety as well as improve transit connections.

Challenges

The current budget constraints limit staff's ability to implement programs.

Mercer Island

The City of Mercer Island is an island in the middle of Lake Washington with a population of 22,720 and a total land area of 4,042 acres.

Goals and achievements

Mercer Island is actively involved in reducing GHG emissions and has a reduction goal of 80 percent below 2000 levels by 2050.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The City has an interdepartmental green team as well as a sustainability sub-committee of the city council.

Climate Action Plans and GHG Inventories

The City Council adopted a sustainability strategy for the city, including a GHG emission reduction goal and climate action plan. Each department utilizes a sustainability filter when developing programs.

Tree Canopy Protection

Mercer Island is in process of surveying the tree canopy to establish a baseline for future planning and restoration work. Restoration, such as tree planting and invasive species removal, is

occurring in park areas. There is also a tree planting program focused on canopy loss due to residential redevelopment.

Renewable Energy

The City assisted the school district in acquiring grant funds to install solar panels on the high school. Mercer Island has also purchased a biofuel station, but has not yet installed it.

Environmental Outreach and Education

The City conducts numerous environmental education and outreach activities, including the following:

- Inserts in the water bill to encourage conservation
- Details of sustainable practices to Mercer Island residents through the Mercer Island Quarterly, electronic newsletter, and website
- "Leap for Green" Earth Day Celebration
- Farmers Market to encourage consumption of local and organic produce

Performance Measures

The City also publishes the City Green Report and measures progress by tracking:

- Energy use
- Rate of recycling
- City fleet fuel reduction
- Community-wide carbon footprint

Efficiency Measures

Energy Efficiency

City Council has established a Green Ribbon Commission that advises the Council on energy efficiency tools and marketing ideas. The City is currently partnering with Puget Sound Energy

in the Home Energy Audit comparison program. The City has also hired a resource conservation manager that is implementing municipal energy audits and implementing upgrades to lights and windows. The upgrades are being funded through an EECBG grant.

Water Conservation

Mercer Island has its own water utility and has implemented tiered water rates to provide incentive for conservation. The Parks Department is working to promote healthy grass and root zones to increase efficiency of water use and Maintenance Department is utilizing drought tolerant landscaping for City Hall.

Waste Reduction

The City has updated its contract with its waste disposal company to provide curbside recycling and food waste composting.

Green Building

The City has removed barriers to green building in the development code and is providing incentives for green developers.

Transportation

Electric Vehicle Infrastructure

Ten charging stations are planned for installation in 2011.

Municipal Green Fleets

The City is a founding member of the Evergreen Fleet Initiative and is transitioning fleet to low emission vehicles. The council is considering acquisition of electric vehicles.

Commute Trip Reduction

A shuttle is provided to augment transit service from the south to the north end of the island. Rideshare online is also actively promoted within the community and the city. The City is

implementing an updated bicycle and pedestrian plan by adding shoulder width to main roads and signage to identify paths.

Transit Oriented Development and Land Use

Cluster development is encouraged especially around the lightrail station. Provide zoning that mandates the higher density in the downtown area, which promotes walking to restaurants/stores. (Department: Development Services)

Challenges

As with many jurisdictions, climate change has a lower priority than many other competing issues.

Bellevue

Bellevue is the second largest city in King County with a population of 120,600 and a land area of 20,538 acres. It has made great strides in addressing climate change through its Environmental Stewardship Initiative that includes energy efficiency, transit oriented development, education and outreach, and electric vehicle infrastructure programs.

Goals and achievements

Bellevue is a member of ICLEI and a signatory to the US Mayor's Climate Protection Agreement, and has adopted the goal to achieve a seven percent emission reduction below 1990 levels by 2012. The City has also:

- Recently installed the first two "smart" electric vehicle charging stations at Bellevue City Hall, with several more planned at other locations in the future.
- Provided leadership for the C7 group of eastside cities that are working collaboratively together to improve energy efficiency through the residential Home Energy Audit program, and to promote electric vehicle infrastructure useability.

- Replaced ninety gas engines with hybrids in the City fleet, and continuing to transition to a lower emission fleet.
- Won awards for recycling, education, and sustainable, transportation-oriented development.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The Environmental Stewardship Initiative is implemented by a steering committee of representatives from all departments and overseen by the City Manager's office.

Climate Action Plans and GHG Inventories

Bellevue conducted and internal GHG emission inventory in 2007 and adopted a Climate Action Plan for municipal operations in 2008.

Tree Canopy Protection

Bellevue has a large park system with significant areas of natural forest that is managed under the Urban Forest Program. There are some efforts for tree retention but nothing aggressive. Two neighborhoods have requested protection from clear-cutting. Bellevue's current impervious surface area is 46 percent. There are currently no plans by the City to extend the tree canopy, however, the Mercer Slough Environmental Education Center hosts annual community tree planting events on Arbor Day.

Renewable Energy

Residents have the option of purchasing renewable Green Power through Puget Sound Energy's voluntary program. The City provides resources for residents to recycle used cooking oil.

Environmental Outreach and Education

The award-winning Carbon Yeti program helps educate students and residents on how to reduce carbon emissions. Through a partnership with Puget Sound Energy, the City has worked with Bellevue's middle schools to promote the program and have received commitments for the Smaller Footprint Pledge for emission reduction activities from over 800 households. The City Manager's office has also utilized education internally to assist decision makers in understanding the environmental and economic benefits of sustainability activities. The City also contributes to a regional web portal on sustainability that provides information about alternative vehicles.

Performance Measures

Bellevue primarily focuses on cost saving measures such as reductions in fuel, water, and energy use. Specific areas where they are calculating savings and progress are:

- Rate of recycling
- City fleet fuel reduction

Efficiency Measures

Energy Efficiency

The Home Energy Audit program will perform audits for Puget Sound Energy customers and provide Energy Performance Scores that can be compared with anonymous neighbors. They have also developed a community action plan for energy conservation with the University of Washington's Program on the Environment. Bellevue has an in-house Resource Conservation Manager, funded in part by Puget Sound Energy, who is implementing energy conservation measures, such as:

- Upgrading lighting in public facilities through improved design and higher efficiency lights

- Reducing hot water temperatures to 120F
- Replacing old boilers with highly efficient boilers
- Installing low-flow water fixtures such as showerheads and aerators
- Educating employees about energy efficiency
- Replacing incandescent light bulbs in traffic signals with new light-emitting diodes

Water Conservation

The Resource Conservation Manager is implementing steps for reduction in water use for municipal operations, including installing low flow shower heads in the employee gym. The City also participates in the Saving Water Partnership and provides educational materials to residential and commercial customers for water conservation.

Waste Reduction

Bellevue received two recycling awards this year:

- For educational work in the community, they received the 2010 Youth Education Recycler of the Year Award from the Washington State Recycling Association.
- For internal operations they were one of seven cities that received the 2010 King County Best Workplaces for Recycling and Waste Reduction award. They have cultivated a successful internal food waste recycling program.

Green Building

The Green Building team is focused on building a foundation to support and educate green developers and residential homebuilders. The team is developing Greenpath, a streamlined permitting process for single family homes. Many of the staff members have also completed green building training and have LEED certification. The city does not have any specific green building requirements for new construction.

Transportation

Electric Vehicle Infrastructure

As noted above, the City of Bellevue has already installed two charging stations at City Hall and have 25 to 30 more planned throughout the City. Funding was provided primarily through grants from Charge-Point America, Ecotality, Department of Energy, and the Puget Sound Clean Cities Coalition. The City is working to streamline the permitting process and reduce costs for installation of charging stations.

Municipal Green Fleets

The City is aggressively replacing gas vehicles with hybrids and currently has 90 hybrid vehicles in the fleet. Bellevue is a member of the Evergreen Fleet Initiative

Commute Trip Reduction

The city has complied with the state's commute trip reduction requirements, and is also in the final planning stages for Sound Transit's lightrail Eastlink that will provide a low emission and efficient transit option for thousands of commuters.

Transit Oriented Development and Land Use

The Puget Sound Regional Council recognized Bellevue's Bel-Red Project with a Vision 2040 award for its land use planning efforts to link transportation, jobs, housing and recreation through changes to zoning and development regulations. Bellevue is also involved in the county-wide Growth Management Planning Council.

Challenges

The biggest challenges for the City of Bellevue in implementing climate change mitigation are the current economic downturn and the competition for higher priorities. The economy and

slow development rate is causing the Bel-Red project to not be implemented. Bellevue is also working within a highly urbanized environment.

Issaquah

Issaquah is the fastest growing city in King County, partially due to annexations, with a doubling of population in the last decade to 26,890 and an increase in acreage to 7,268. Fifty-nine percent of this area, 4,041 acres, is forested. Efforts to reduce emissions are focused in green building, energy efficiency, waste reduction, and decreasing vehicle miles travelled.

Goals and achievements

Issaquah has identified some substantial sustainability goals that will aid in mitigating emissions, such as:

- Reducing emissions by 80 percent of 2007 levels by the year 2050.
- Committing to no net loss of tree canopy.
- Banning use of polystyrene and requiring all restaurants to use recyclable containers.
- Reducing water usage by conserving 15 percent per household by 2015 from 1995 levels.

To reach these goals and others, Issaquah has implemented an exemplary and comprehensive environmental education and outreach program that has involved community members in decision making and community building. The annual Salmon Days has become a hallmark event of family fun and learning.

Systemic Sustainability Planning

Internal Coordination and Collaboration

Issaquah has a Resource Conservation Office with four full-time staff that oversee and coordinate climate change mitigation and sustainability activities.

Climate Action Plans and GHG Inventories

The City completed a carbon footprint for the community as well as GHG inventories in 2000, 2005, and 2007. The City is a member of ICLEI and the Mayors Climate Protection Agreement and is planning to develop a climate action plan.

Tree Canopy Protection

Issaquah has recently completed a tree canopy assessment intended to serve as a baseline for future Climate Change work and tree preservation goals. New protections include regulations that limit removal of Significant and Landmark Trees. At least 30 percent tree retention is required for single family developments. Issaquah is a member of Tree City USA.

Renewable Energy

The City promotes the use of renewable energy through the Puget Sound Energy's Green Power Program. Approximately five percent of households are participating in the program, so there is a lot of opportunity for growth. Currently under construction, the newest Issaquah Fire Station will be one of the most resource efficient in the country, equipped with a 10,000 gallon rainwater cistern, an 8 kW solar array, and a geothermal heating system.

Environmental Outreach and Education

Issaquah has an extensive environmental outreach and education program that is based on collaboration and partnerships. The City works with the school district, business network, and the community in providing classes, events, and programs. They host numerous citizen commissions and community events, such as the sustainability movie night series. One of the most successful events is Salmon Days with 150,000 attendees every year. A home retrofit tour and class project is in the planning stages.

Performance Measures

Issaquah developed a Sustainability Indicators Report with input from multiple departments and community leaders to measure progress. Out of 26 indicators identified, the following 18 are related to sustainability and climate change:

- Carbon Footprint
- Mobility
- Community Health
- Current and Planned Density
- Education
- Energy use
- Food Grown Locally
- Green Buildings
- Population Density
- Preserved Natural Open Space
- Quality of Life
- Renewable Energy Use
- Stream Health
- Transportation by Type
- Tree Canopy
- Walkability
- Waste Generation
- Water Use

Efficiency Measures

Energy Efficiency

The zHome project in Issaquah is the first multi-family, zero energy, carbon neutral community in the US. It will emit net zero carbon emissions using advanced energy-efficient techniques and solar panels.

Through partnerships with Puget Sound Energy over the past decade, residential energy use has decreased 38 percent due to promotion of energy efficiency techniques and education. The City was recently awarded an EECBG energy grant to develop an Energy Efficiency and Conservation Strategy, which includes building energy audits, energy efficiency retrofits, and upgrades to traffic signals and street lighting.

Water Conservation

The zHome project will use 60 percent less water than standard residential development by utilizing conservation technologies, low impact landscaping with native drought tolerant plants, and capturing and recycling rainwater for toilet flushing and clothes washing. Issaquah has also set a high goal for the rest of community of reducing water usage 51,000 gallons a day from 2008 levels by 2013. The website provides a comprehensive summary of information and tools available to reduce home water use. To support reduced water use the City provides to all water customers at no charge irrigation rain sensors that will turn off automatic sprinklers when it rains. Through a pilot program in partnership with the Cascade Water Alliance, they are also providing new water efficient toilets, faucets, and showerheads.

Waste Reduction

The current waste reduction goals are diversion to recycling or composting of 55 percent of the waste produced by 2015 and 70 percent by 2020. To help meet this goal Issaquah has banned use of polystyrene containers and are now providing composting and recycling services to all residents. They recently earned the Recycler of the Year from the Washington State Recycling Association for their efforts diverting 4.3 tons of waste during the Salmon Days festival, which uses all compostable and recyclable containers.

Green Building

A Sustainable Building Partnership was formed in 2004 between the City and several developers to develop a sustainable building program. The Sustainable Building and Infrastructure Policy that requires all new City buildings to be built green was adopted by City Council. The number of current built green homes in Issaquah represents 14 percent of housing.

Transportation

Electric Vehicle Infrastructure

Issaquah is in line to receive electric vehicle charging stations at the Issaquah Highlands Park & Ride and City Hall Northwest, as part of a plan unveiled Monday by King County Executive Dow Constantine.

Municipal Green Fleets

The city's long-term goal is to become Evergreen Fleets certified by updating its Green Fleet policy and transitioning more vehicles to hybrid or electric

Commute Trip Reduction

The city has surpassed the state's commute trip reduction requirements, and has set goals to reduce vehicle miles travelled by 13 percent. To help meet these goals, Issaquah has developed a Salmon Friendly Commuting Program for businesses called ITrip. Getting Around Issaquah Together (GAIT) is a group of citizens funded by the City that are working to promote pedestrian, bicycle, and transit use through development of policy, new safer bike lanes and walking paths, and a bicycle and walking map of Issaquah.

Transit Oriented Development and Land Use

The Central Issaquah Task Force developed a sustainable vision for how to redevelop Central Issaquah that focuses on well-designed mixed use development to allow people to live near jobs and a transit center, which will reduce dependence on cars. The plan also includes adding six new parks, developing trail connections throughout the area, and adding bike lanes.

Challenges

There is a lack of incentives to switch to renewable energy sources such as Green Power. The constraints of the current budget limit staff's ability to implement programs.

Auburn

Auburn is a major hub of South King County with a population of 60,820 and a land area of 55,078 acres. It is situated in the Green River Valley and is a part of King and Pierce Counties.

Goals and achievements

Auburn is a member of ICLEI and the Mayor's Climate Protection Program, as well as Mayor's Alliance for Green Schools.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The City has a Green Team with representatives from most departments that meet quarterly to report on what each division is doing to become more sustainable. The City adopted Resolution 4368 to commit to Global Sustainability Support. Most policies and programs are reported on and coordinated by the Green Team at quarterly meetings.

Climate Action Plans and GHG Inventories

The Planning and Development Department led efforts to conduct the municipal inventory and the community inventory, which began in June 2009 and were completed in August 2010. The City has not yet established an emission reduction goal. The City's greenhouse gas inventory was adopted as an appendix to the comprehensive plan. More greenhouse gas emissions information will be included with the next update of the City's comprehensive plan.

Tree Canopy Protection

The City requires that significant trees be identified and retained whenever possible during development. Auburn is a Tree City USA and has community grants available for tree planting.

Renewable Energy

The City is not currently promoting renewable energy.

Environmental Outreach and Education

Auburn is involved in the following environmental outreach and education activities:

- Provides education on waste prevention and recycling to Auburn residents, businesses, community groups, and schools.
- Participates in County, State, and Regional Solid Waste and Hazardous Waste meetings, trainings, promotions, and events.
- Provides input to County and Department of Ecology Solid Waste and Recycling and Hazardous Waste Programs and policies.
- Provides recycling opportunities to residents in most City Parks.
- Provides recycling opportunities to residents at City Events. Promotes Event Recycling to public.
- Supports the Washington State Recycling Association (WSRA) by attending scheduled tour and training events, and by volunteering on the WSRA Conference Committee.
- Promotes recycling and waste prevention to employees (through emails, support of department green teams, and promotional materials such as posters, signage, intranet, and incentives).

Performance Measures

The greenhouse gas inventory is intended to be a means to track City programs over time. Programs are also tracked and discussed at quarterly Green Team meetings. Other measures that are tracked include energy use.

Efficiency Measures

Energy Efficiency

Auburn has implemented numerous energy efficiency measures, such as:

- Replacing approximately 95 percent of City traffic signals with LED lights.
- Converting approximately 1,000 streetlights along arterial streets to lower-wattage LED fixtures.
- Turning city computers off at night
- Utilizing occupancy sensors in City buildings
- Replacing standard appliances with Energy Star rated appliances
- Designing the City's new Activity Center and Community Center to achieve LEED rating
- Auditing buildings for energy use
- Upgrading the HVAC system in City Hall
- Hiring a .5 FTE Resource Conservation Manager who will be identify opportunities for energy conservation in city facilities

The Resource Conservation Manager focuses primarily on reducing utility costs (electricity, natural gas and water) by performing energy audits and identifying specific operation protocols that reduce energy use. Detailed energy accounting will help track energy use and cost and will provide the basis for developing an Energy Use Index for all City buildings and facilities.

Water Conservation

Auburn uses an inclining block rate structure for water bills to promote conservation. They have also fully metered the entire water system and have:

- Implemented a low-flow showerhead giveaway program, estimated to save 2 million gallons of water annually.
- Established goals to become a leader in water conservation and becoming a member of the Partnership for Water Conservation.

- Implemented policies to reduce irrigation needs for public and private landscaping, including use of timed sprinklers and rain sensors.
- Monitored infrastructure for leak detection and repair, estimated to save 6.6 million gallons annually and reduce the City's leakage rate to 8.4 percent.

Waste Reduction

All residents have access to recycling services.

Green Building

The City adopted new development standards for multi-family and mixed developments that incorporate incentive based sustainability practices.

Transportation

Electric Vehicle Infrastructure

The City is not currently planning for electric vehicle infrastructure.

Municipal Green Fleets

The City of Auburn has three Prius Hybrid vehicles and one Ford Escape Hybrid vehicle in its vehicle fleet for employee use.

Commute Trip Reduction

Auburn participates in the Commute Trip Reduction program. Employees are offered a $50/month subsidy for taking public transit.

Transit Oriented Development and Land Use

Auburn is striving to reduce vehicle miles travelled and urban sprawl by supporting sustainable land use and transportation decisions.

- The transit station downtown is served by Sounder Commuter Rail, Sound Transit Express Buses, and King County Metro Transit Buses. There is a parking garage (676

spaces) as well as bicycle lockers. Parking garage is at capacity, so shuttles have been added to link the transit station to the Lakeland Hills neighborhood. The City hopes that a second parking garage will be added as a Sound Transit project.

- Numerous existing bicycle lanes and multi-use trails exist and the Transportation, Transit and Trails Committee and a Bicycle Task Force meets monthly to discuss bicycle issues and opportunities. -
- The Environmental Park Zoning District seeks to encourage green manufacturing and development land uses.

Challenges

The primary challenges are competing priorities and lack of resources for climate change outreach and programs.

Bothell

Bothell has a population of 17,260 and a total land area of 7,800 acres. Bothell is part of two counties, King and Snohomish. The City is currently in process of developing an overarching sustainability plan and redesigning its downtown corridor with state of the art energy efficiency and environmentally friendly designs.

Goals and achievements

Bothell is a member of ICLEI and a signatory to the US Mayor's Climate Protection Agreement, and has adopted the goal to achieve a seven percent emission reduction below 1990 levels by 2012. The City is also planning a community energy district in the downtown corridor, and developing a Carbon Reduction and Energy Independence Plan.

Systemic Sustainability Planning

Internal Coordination and Collaboration

Bothell's Green Team includes employees from every department and meets monthly to implement sustainability directives that effect all operations and processes of city government. The team focuses on how to remove barriers and make it easy to be sustainable. They work on developing individualized solutions for each department.

Climate Action Plans and GHG Inventories

The Bothell CO2OL Plan for Carbon Reduction and Energy Independence Plan is an overarching sustainability strategy that will reduce GHG emissions and promote sustainability. The City has recently completed a GHG emissions inventory and is in the process of developing a GHG reduction plan.

Tree Canopy Protection

Bothell is a member of Tree City USA and actively conducts tree planting projects on Arbor Day and year-round in a recently developed passive park. The City also promotes tree retention through substantial regulatory requirements.

Renewable Energy

A Community Energy Plan will be developed for the downtown redevelopment and the community energy district that will consider using steam, thermal, biomass, wind, solar or a combination.

Environmental Outreach and Education

Bothell hosts numerous environmental education events, such as the Hydrogen Car Rally, Bike-to-work day with booths along the Burke-Gilman trail, and the annual downtown Riverfest festival. They also hosted National Night Out in partnership with Puget Sound Energy to

promote community and energy efficiency. The City also provides extensive information on their website and social networking sites.

Performance Measures

Bothell is measuring waste reduction, recycling rates, city fleet fuel reduction, and water and energy conservation efforts.

Efficiency Measures

Energy Efficiency

The City partners with Snohomish PUD and Puget Sound Energy on numerous projects to increase energy efficiency. PSE recently make available a free energy efficiency kit to all customers in Bothell. The Re-Energize Your Block Kit included energy savings tips, information on services, coupons from, and prizes. Bothell is also planning to create a community energy district during the redevelopment of the downtown area that will increase energy efficiency and reduce costs.

Water Conservation

The City has partnered with other jurisdictions and UW Bothell to host a spring garden fair that promotes water-wise gardening. They are also using graywater to irrigate local golf courses.

Waste Reduction

Bothell is actively pursuing ways to reduce waste by providing numerous recycling and composting opportunities, including collection of hazardous materials and electronics. They are also using imbedded garbage collection rates that provide incentives for smaller containers or a reduced pick-up schedule. For internal operations they were one of seven cities that received the 2010 King County Best Workplaces for Recycling and Waste Reduction award.

Green Building

All new city buildings are built to LEED standard. LEED standards are encouraged, but not required, for new development.

Transportation

Electric Vehicle Infrastructure

No electric charging stations are planned at this time.

Municipal Green Fleets

One of the actions in the Carbon Reduction and Energy Independence Plan is to develop a Green Fleet Program that encourages purchase of fuel efficient and low carbon emitting vehicles.

Commute Trip Reduction

Bothell surpasses the requirements of the commute trip reduction program by providing incentives and fun events, such as bike to work day with raffle drawings. They also subsidize employees commuting expense.

Transit Oriented Development and Land Use

Bothell is currently redeveloping its downtown corridor with sustainability in mind with a focus on creating a walkable community. New residential developments nearby are easily within walking distance of downtown amenities.

Challenges

The biggest challenge for the City of Bothell in implementing climate change mitigation is budgetary constraint.

Snoqualmie

Snoqualmie is the fastest growing city in King County with a population of 9,730 and a land area of 4,131 acres. It currently has 540 acres of open space, 34 parks, and 25 miles of hiking and walking trails. It is known for its scenic beauty and is home to Snoqualmie Falls. Snoqualmie is committed to preserving this beauty and protecting the environment.

Goals and achievements

Snoqualmie is a signatory to the U.S. Mayors Climate Protection Agreement and id developing an emission reduction strategy.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The Sustainability Action Team is not currently meeting, but one employee tracks sustainability progress. The City is working to integrate the Sustainability Strategy into the comprehensive plan.

Climate Action Plans and GHG Inventories

The City is in process of completing the emissions inventory and is planning to develop a climate action plan that reduces the city's carbon footprint.

Tree Canopy Protection

The City of Snoqualmie is actively involved in forest conservation through its efforts with the Mountains to Sound Greenway project and preservation of the Weyerhaeuser Tree Farm. The Snoqualmie Preservation Initiative protects thousands of acres of wilderness in the surrounding area. Snoqualmie has an extensive urban forestry program and is aiming for a TreeCity USA designation.

Renewable Energy

Snoqualmie produces clean, sustainable electricity from the Snoqualmie Falls power plant. The City is also exploring other ideas, such as promotion of a community solar program.

Environmental Outreach and Education

The Planning Commission hosted a Sustainability Speakers Forum that focused on green community planning such as transportation, energy, and future growth. A University of Washington student team facilitated an online citizen sustainability survey to ascertain community knowledge and priorities. The results helped shape the Sustainability Strategy.

Performance Measures

The City is tracking rate of recycling, energy use, and water consumption.

Efficiency Measures

Energy Efficiency

The City requires that new development utilize energy saving techniques.

Water Conservation

Reclaimed wastewater is being used for irrigating parks and golf courses. The City is encouraging all new development to utilize low flow toilets and showerheads, and is allowing the use of rain barrels.

Waste Reduction

The wastewater treatment plant processes sewer water and produces class A biosolids for agricultural use as fertilizer. The City has also initiated a campaign to significantly increase and broaden recycling efforts.

Green Building

Snoqualmie's new City Hall is built to green standards and serves as a model for the community. City code encourages all new construction to comply with Built Green's level 3 energy and water efficiency standards.

Transportation

Electric Vehicle Infrastructure

Snoqualmie is in the beginning planning stages to install an electric vehicle charging station.

Municipal Green Fleets

The City's public fleet currently has two hybrids and will eventually convert the entire fleet to alternative fuel vehicles,

Commute Trip Reduction

The City is not currently participating in the state program, however it is in process of developing a master bicycle and pedestrian trails plan.

Transit Oriented Development and Land Use

The City is implementing pedestrian-oriented urban design and developing anti-sprawl land use policies. The largest development in the City was constructed utilizing the New Urbanist planning design, which promotes walkability and mixed use development.

Challenges

The primary challenge for Snoqualmie is a lack of resources to implement programs.

Renton

Renton is the fifth largest city in King County with a population of 83,650 and a land area of 14,276 acres. The City is located on the south shore of Lake Washington with the Cedar River running through downtown.

Goals and achievements

The City of Renton is a signatory to the Mayor's Climate Protection Agreement and recently became a member of ICLEI. The City is also involved in the county-wide Growth Management Planning Council.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The City of Renton is embarking on a Clean Economy Strategy that will encompass a comprehensive city-wide effort to reduce city operation costs and develop and implement sustainability policies, reducing greenhouse gas emissions. They do not currently have an interdepartmental green team.

Climate Action Plans and GHG Inventories

The City's first GHG inventory is underway and will be completed in 2011. The results of the inventory will help to identify future efforts and activities.

Tree Canopy Protection

The tree preservation ordinance requires retention of 35 percent of trees. Permits are required for tree cutting, and replacement trees are required.

Renewable Energy

There are not any current efforts in the City of Renton at this time to promote renewable energy.

Environmental Outreach and Education

Renton provides educational resources via its website and e-newsletter. To seek community involvement, the City requested input on the Parks, Recreation, Open Space, and Natural Resources Plan via an online questionnaire and community meetings.

Performance Measures

Renton utilizes performance measures that also identify cost savings, such as:

- Energy use
- Rate of recycling
- City fleet fuel reduction

Efficiency Measures

Energy Efficiency

One of the goals of the new strategy is to develop waste water heat recovery mechanisms. The City is currently updating HVAC systems within City buildings.

Water Conservation

The City provides educational materials and water saving devices for residents. Parks department is reviewing water usage and considering water conservation measures.

Waste Reduction

Renton has a progressive waste collection system that includes every other week pick-up and food composting. This, and other efforts, has resulted in a 72 percent recycling rate in the community, one of the highest in the state.

Green Building

The City's comprehensive plan states that civic facilities will be guilt to LEED silver standard or better. Built Green and LEED certified building is encouraged within the community but not required.

Transportation

Electric Vehicle Infrastructure

The City recently passed code to allow electric vehicle infrastructure and will begin installing charging stations at six sites in 2011.

Municipal Green Fleets

Renton is a member of the Evergreen Fleets Initiative and has several hybrid vehicles within the city fleet.

Commute Trip Reduction

A comprehensive walkway study was completed in 2008 that laid the foundation for the development of new street standards and safer pedestrian routes. The Complete Streets Ordinance passed in 2010 requiring new street standards with requirements for bike facilities; community space in higher residential zones; and mixed-use business district areas, with the intent to reduce vehicle dependence. A shuttle that runs between high-use areas and rail station is provided to assist in reducing automobile use.

Transit Oriented Development and Land Use

The new Clean Economy Strategy includes a focus on developing mixed used districts with multi-modal transportation options.

Challenges

Renton's challenges include budgetary constraints as well as a low level of environmental outreach and education.

Tukwila

The City of Tukwila has a population of 18,170 and a total land area of 5,866 acres. It is a major commercial center situated adjacent to the Duwamish and Black Rivers.

Goals and achievements

One of Tukwila's primary goals is to redevelop the 1,000 acre Southcenter district transforming it from its suburban footprint to an urban setting with transit and pedestrian-oriented development patterns. The City recently received an American Planning Association award for its Walk and Roll plan.

Systemic Sustainability Planning

Internal Coordination and Collaboration

The interdepartmental green team is led by the Community Development department and focuses on city operations primarily in public works and Community Development. There are some overarching sustainability regulations driven by state and federal regulations, but sustainability is not an overall focus for the City.

Climate Action Plans and GHG Inventories

GHG inventories for city operations and the community were conducted in 2006 and 2007. Tukwila's emission reduction goals are to reduce emissions from city operations 50 percent below 2006 numbers by 2020 and community-wide emissions 20 percent below 2006 numbers by 2020. Tukwila is a former member of ICLEI and a current signatory of the Mayor's Climate Protection Agreement.

Tree Canopy Protection

Trees are protected within critical areas.

Renewable Energy

Puget Sound Energy and Seattle City Light provide residents with the option to purchase renewable energy.

Environmental Outreach and Education

The City started the program to meet NPDES requirements and subsequently formed a stream team.

Performance Measures

Tukwila utilizes the following performance measures:

- Energy use
- City fleet fuel reduction

Efficiency Measures

Energy Efficiency

Tukwila is implementing energy efficiency retrofits funded through an EECBG grant. The City does not provide any energy efficiency incentives.

Water Conservation

Tukwila is a member of the Cascade Water Alliance and provides water conservation kits to residents.

Waste Reduction

Tukwila does not require residents to utilize garbage service, however homes and multi-family units that have garbage service get free recycling. The Tukwila Business Recycles Program - The City of Tukwila Business Recycles Program provides a free "Tukwila Business Recycles Kit" and free recycling assistance to Tukwila businesses.

Green Building

There are currently no incentives for green building in city code.

Transportation

Electric Vehicle Infrastructure

The City is planning to adopt the state model ordinance next year. No charging stations are currently planned.

Municipal Green Fleets

Tukwila is adding hybrids to its city fleet, and changing to 4-cylinder vehicles vs. heavy trucks when appropriate.

Commute Trip Reduction

The City provides oversight for private companies that are effected employers and also provides incentives for city employees to reduce miles driven.

Transit Oriented Development and Land Use

The City actively promotes transit solutions, such as lightrail, and is advocating for a route through the urban center. The City's Walk and Roll plan to add bicycle lanes and improve walkability received an award from the Washington American Planning Association. There is also a substantial trail system along the Green River.

Challenges

The City does not have authority to decide location of lightrail station and the current planned location does not support the City's sustainability strategy. Tukwila also faces budgetary constraints.

Appendix B: King County Cities and Towns

Algona	Federal Way	North Bend
Auburn	Hunts Point	Pacific
Beaux Arts Village	Issaquah	Redmond
Bellevue	Kenmore	Renton
Black Diamond	Kent	Sammamish
Bothell	Kirkland	SeaTac
Burien	Lake Forest Park	Seattle
Carnation	Maple Valley	Shoreline
Clyde Hill	Medina	Skykomish
Covington	Mercer Island	Snoqualmie
Des Moines	Milton	Tukwila
Duvall	Newcastle	Woodinville
Enumclaw	Normandy Park	Yarrow Point

Appendix C: Survey and Interview Questions

Telephone Survey

1. Is your jurisdiction currently undertaking any environmental sustainability planning?
    a. Do you have a sustainability department, coordinator, or interdepartmental team that addresses sustainability issues, such as a green team? If yes, who is the contact person?
    b. Are these programs or policies comprehensive throughout the city, or only in certain departments?
    c. Are the actions focused on municipal operations and/or the community at large?
    d. Are the actions incentive-based or regulatory?
2. Does your jurisdiction have any programs or policies focused on reducing greenhouse gas emissions or otherwise mitigating or adapting to climate change? If so:
    a. What kind of program do you have?
    b. Has your jurisdiction conducted a GHG emissions inventory?
        i. When was this conducted?
        ii. Have you updated it regularly?
    c. Does your jurisdiction have an emission reduction goal? If so,
        i. What is it?
        ii. What is your baseline year?
        iii. Are you on target to reach it?
    d. Does your comprehensive plan address climate change, GHG emission reduction, or energy efficiency?
3. What actions has your jurisdiction planned or implemented to address sustainability, energy and/or climate change goals? For each of the following please indicate if this is an action that is planned or in progress. Also, please indicate any challenges you have encountered.
    a. Transportation choices

i. Alternative vehicle promotion
    1. Hybrids in public fleets
    2. Electric vehicle infrastructure
    3. Other
ii. Transit options
iii. Reducing vehicle miles travelled
iv. Bike use promotion (routes, paths)
v. Pedestrian sidewalks, paths
vi. Road pricing (driving or parking charges)
vii. Driving efficiency (traffic light timing)

b. Waste reduction
    i. Waste-to-resources and waste-to-energy (composting, recycling, biofuel, etc.)

c. Clean fuels, clean energy, and energy efficiency
    i. Renewable energy development
    ii. Energy efficiency

d. Land use, urban planning and design
    i. Sustainable community planning
    ii. Green building codes
    iii. Low impact development
    iv. Tree retention

e. Air quality

f. Water conservation

g. Carbon sequestration (i.e., tree planting)

h. Environmental outreach and education

   i. Other

4. Overall, how successful are your programs?
   a. How are you measuring success?
5. Are you currently working with a network such as ICLEI or the Mayor's Climate Protection program?
   a. If not, have you considered becoming a member?
   b. If you were, but aren't currently, why not?
6. Do you participate in any King County sustainability programs, like Green Tools or the Sustainability Roundtables?
7. Are you interested in potentially working with other King County cities and King County government on climate and energy solutions?

In-person Interview Questions

The in-person interview was conversational with the following questions providing a framework:

1. In what ways would you like to collaborate with other cities and with King County?
2. Which resources would you find useful to implement current and future actions?
3. In what ways could the County help support the work you do and assist you in increasing implementation of mitigation actions?

Appendix D: Proposal and Pledge

King County Cities Climate Collaboration

Acknowledgments

Facilitator

Linda Lyshall	PhD Candidate, Antioch University, Leadership and Change

County Lead

Matt Kuharic	Senior Climate Change Specialist, King County

Steering and Implementation Committee

Rika Cecil	Environmental Programs Coordinator, City of Shoreline
Matt Kuharic	Senior Climate Change Specialist, King County
Sheida Sahandy	Assistant to City Manager & Senior Policy Advisor, City of Bellevue
Nicole Sanders	Associate Planner, City of Snoqualmie
Kris Sorensen	Associate Planner, City of Renton
Justus Stewart	Regional Associate, ICLEI

Workshop Participants

Cathy Beam	Principal Environmental Planner, City of Redmond
Rika Cecil	Environmental Programs Coordinator, City of Shoreline
Matt Kuharic	Senior Climate Change Specialist, King County
Brandon Miles	Senior Planner, City of Tukwila
Aaron Nix	Natural Resources and Parks Director, City of Black Diamond
Mike O'Grady	Councilmember, City of Mercer Island
Sheida Sahandy	Assistant to City Manager & Senior Policy Advisor, City of Bellevue
Nicole Sanders	Associate Planner, City of Snoqualmie
Kris Sorensen	Assistant Planner, City of Renton
Patti Southard	Green Tools Project Manager, King County
Justus Stewart	Regional Associate, ICLEI
Bobbi Wallace	Storm and Sewer Division Manager, City of Kirkland
Karen Wolf	Lead Analyst, Strategic Planning and Performance Mgmt., King County

This process was facilitated by Linda Lyshall as a research project for her PhD dissertation in Leadership and Change at Antioch University. In addition to the above participants in the process, Mary Monfort served as a third party observer to provide critique to Ms. Lyshall on the research process.

Introduction

Through many of its policies and programs, from green building assistance to enhancing transportation options, King County is working to reduce operational and community environmental impacts while supporting its 39 cities and towns in their climate change and sustainability related efforts. Many cities are developing and implementing their own related projects and programs, such as incorporating sustainability policies in their comprehensive plans, creating interdepartmental Green Teams, and greening their municipal fleets. In an effort to move the region forward on climate action, King County and city staff from nine cities have collaborated to develop recommendations on how to increase implementation of climate relevant sustainability policies, projects and programs.

The first component of this project assessed current and planned climate change mitigation actions and related sustainability efforts by King County jurisdictions. This work included reviewing existing documents and websites, conducting a telephone survey of King County jurisdictions, and in-person interviews with several of the jurisdictions that are most active in this work. The compilation of this work is presented in a case study in Chapter IV and city profiles in Appendix A.

The second phase of this project involved a series of three workshops with staff from nine self-selected cities, King County, and ICLEI to develop recommendations for how King County and partner jurisdictions could collaborate to make progress on climate solutions. This workgroup developed the following recommended next steps with input from workshop participants, steering committee meetings, and survey results.

Proposal to Develop the King County Cities Climate Collaboration

The overarching workgroup priority was to advance regional collaboration on climate solutions with the intent to raise all jurisdictions to a higher level of activity while also supporting a more resilient economy. This work supports the climate change policies developed by the King County Growth Management Planning Council and reflects a need for, and interest in, collaborating on solutions and sharing technical expertise, experience and resources. To further this goal of regional collaboration on climate solutions, the group recommends the following:

1. Adopt the King County Cities Climate Collaboration Pledge.
2. Initiate and sustain the King County Cities Climate Collaboration.
3. Develop King County Cities Climate Collaboration Resources.

The pledge outlines the collaboration focus areas. The intent of the pledge and the priority actions detailed in the following pages is to implement climate protection solutions while providing tangible economic and health benefits for the county and cities, and their citizens. These benefits include:

- Increasing productivity and effectiveness of cities' climate mitigation and related sustainability efforts through sharing and coordination of local efforts;
- Expanding resources for climate related sustainability efforts through the collective pursuit of grants and other funding opportunities;
- Recognizing cities' sustainability efforts through shared marketing efforts;
- Improving public health through reduced air pollution and encouraging healthy activities;
- Reducing energy costs; and
- Supporting economic development and job creation.

Pledge to Participate in King County Cities Climate Collaboration

Whereas, we, the undersigned cities of King County, wish to work together to reduce regional and local sources of climate pollution;

Whereas, we believe that by working together we can increase our efficiency and effectiveness in making progress towards this goal;

Whereas, we are interested in achieving this goal in a way that builds a cleaner, stronger and more resilient regional economy;

Now, therefore, we agree to participate in the King County Cities Climate Collaboration and collaborate regionally on the following:

- Outreach: Developing and refining messaging and framing for climate change outreach for decision makers, city staff, and the general public.

- Coordination: Collaborating on adopting consistent standards, benchmarks, strategies, and overall goals related to responding to climate change.

- Solutions: Sharing local success stories and challenges as well as cost/benefit analyses to support and enhance climate mitigation efforts by all partners.

- Funding and resources: Collaborating on securing grant funding and other shared resource opportunities to support implementation of climate related projects and programs.

Signature: _____
Mayor or City Manager

Priority Actions Identified

The following is an outline of initial priority action items identified by the steering committee and workshop participants. Concurrent and subsequent action items will also be developed by the participants as the process moves forward.

1. **Adopt the King County Cities Climate Collaboration Pledge**
   Budget: Staff Time
   - 1.1 All cities and towns within King County will be encouraged to sign the pledge and participate in the King County Cities Climate Collaboration.
   - 1.2 The pledge will be introduced January 13, 2011 at a special Sustainable Cities Roundtable focused on climate.
2. **Initiate and sustain the King County Cities Climate Collaboration**
   Budget: $9,750
   - 2.1 Use the existing Sustainable Cities Roundtable as the mechanism to convene forums on climate related sustainability issues every-other month.
   - 2.2 Engage as many of the 39 King County cities and towns as possible.
   - 2.3 Include both presentations and discussions.
   - 2.4 Focus the collaborative action on areas of outreach, coordination, solutions, funding and resources as identified in the pledge.
3. **Develop King County Cities Climate Collaboration Resources**

   Support cities in climate protection efforts through in-person collaboration, an on-line center of technical resources, and potential support from Community Energy Action Corps members. The goal is to collaborate on sharing and developing resources and, as resources become available, potentially creating a climate resource center.

   - 3.1 Develop a directory of climate solutions related resources. This could include the following:
     - 3.1.1 County technical expert pool. A list of relevant County technical experts on staff that already provide support for cities sustainability projects and programs. This could potentially be expanded by creating mechanisms for cities to directly contract with County staff to support implementation of city specific projects and programs.
     - 3.1.2 Technical experts from all participating jurisdictions that could help support other cities efforts, share local success stories, or potentially be contracted out to work with other cities.
     - 3.1.3 Technical experts from academia, research institutions, utilities, and other organizations.
     - 3.1.4 List of consultants with local experience and expertise on a diverse range of climate and sustainability related functions.
     - 3.1.5 Best practices and lessons learned from relevant local projects and programs.

3.2 Host an annual symposium, or an annual symposium session track focused for city and county staff, on local climate solutions (Spring 2012)

3.2.1 Potentially a component of the Green Tools confluence, and/or possibly at other venues.

3.2.2 Provide a forum for all local technical experts – a broader group than those engaged in the Cities Climate Collaboration – to share information and best practices

3.2.3 Create opportunities for local governments to increase understanding and gather information on specific climate change mitigation efforts

3.3 Expand the King County Green Tools Program

3.3.1 Expand the Green Tools program beyond green building and sustainable development to include a focus on broader climate protection and sustainability efforts. Green building is one of many climate change mitigation strategies available to local governments. The idea of this action item is to expand this program to include additional climate change mitigation strategies. Steps to accomplish this include the following:

3.3.2 Establishing a new GreenTools staff person who would expand the focus of the GreenTools program to more comprehensively address issues such as sustainable transportation options, clean vehicle efforts, community energy efficiency efforts retrofits, renewable energy projects, and community outreach. The GreenTools staff could develop and implement a focused program and/or also directly support implementation of individual cities on their sustainability related projects or programs.

3.3.3 The current interactive web-based Green Tools program would be expanded to include resources related to the broadened program.

3.4 Create a King County Community Energy Action Corps Hub (Summer 2011)

3.4.1 Cities in the King County region could develop a local Community Energy Action Corps program to help implement their own energy related sustainability project(s) or program(s). In hiring members to support their own efforts, local governments would also create a new regional workforce implementing climate and energy solutions and in doing so foster collaboration between cities, counties, and the AmeriCorps members.

3.4.2 Cities will consider hiring individual members or pooling resources to support one or more shared positions.

Appendix E: Map of King County Cities

http://www.kingcounty.gov/exec/strategy/PerformMgmt/KCGrowthReport/KC-CitiesandProfiles.aspx

References

American Forests (2005). *Regional system analysis: Puget Sound metropolitan area.* Retrieved from http://www.americanforests.org/downloads/rea/AF_PugetSound.pdf

Anders, S. J., De Haan, D. O., Silva-Send, N., Tanaka, S., & Tyner, L. (2009). Applying California's AB 32 targets to the regional level: A study of San Diego County greenhouse gases and reduction strategies. *Energy Policy, 37*, 2831-2835.

Ansell, C & Gash, A, (2008). Collaborative Governance in Theory and Practice. *Journal of Public Administration Research and Theory 18*, 543-571.

Argyris, C. & Schon, D. (1978). *Organizational learning: A theory of action perspective.* Reading, MA: Addison Wesley.

Bäckstrand, K. (2008). Accountability of networked climate governance: The rise of transnational climate partnerships. *Global Environmental Politics, 8* (3), 74-102.

Bartlett, L. (2005). Dialogue, knowledge, and teacher-student relations: Freirean Pedagogy in theory and practice. *Comparative Education Review, 49*, 344-364.

Batty, M. (2008). The Size, scale, and shape of cities. *Science, 319*, 769-771.

Betsill, M. & Bulkeley, H. (2006a). Cities and the multilevel governance of global climate change. *Global Governance, 12*, 141–159.

Betsill, M. & Bulkeley, H (2006b). Transnational networks and global environmental governance: The Cities for Climate Protection program. *International Studies Quarterly, 48*, 471-493.

Bollen, J., Bollen J., Guay, B., Jamet, S. & Corfee-Morlot, J. (2009). Co-Benefits of climate change mitigation policies: Literature review and new results. *OECD Economics Department Working Papers* (Report No. 693). Retrieved from http://www.oecd.org/dataoecd/60/40/41810213.pdf

Boschken, H. (2009, September 3 – 6). *Spanning policymaking silos in urban development and environmental management: When global cities are coastal cities too*. Annual Meeting of the American Political Science Association, Toronto, Canada.

Boyatzis, R.E. (2006). An overview of intentional change from a complexity perspective. *Journal of Management Development, 25*, 607-623.

Brennan, G. (2009). Climate change: A rational choice politics view. *Australian Journal of Agricultural and Resource Economics, 53*, 309-326.

Brenner, N. (2004). *New state spaces: Urban governance and the rescaling of statehood*. New York: Oxford University Press.

Bulkeley, H. (2010). Cities and the governing of climate change. *Annual Review of Environment and Resources, 35*, 229-253.

Burns, J. M. (1978). *Leadership.* New York: Harper & Row

Byrne, J., Hughes, K., Rickerson, W. & Kurdgelashvili, L. (2007). American policy conflict in the greenhouse: Divergent trends in federal, regional, state, and local green energy and climate change policy. *Energy Policy, 35*, 4555–4573.

Calthorpe, P. (2010). *Urbanism in the age of climate change.* Washington, DC: Island Press.

Cashman, A., Nurse, L. & John, C. (2010). Climate change in the Caribbean: The water management implications. *The Journal of Environment and Development, 19*, 42–67.

Changhong, C., Qingyan, F., Minghua, C., Bingheng, C., Chuanjie. H. and Haidong, K. (2001). *The Integrated Assessment of Energy Option and Health Benefit-Full Report.* Shanghai Academy of Environmental Sciences, Shanghai,China.

Chapman, J. (2004). *System failure: Why governments must learn to think differently.* London, England: Demos.

Chew, S. C. (2001). *World ecological degradation: Accumulation, urbanization, and deforestation, 3000 B.C. – A.D. 2000*. Walnut Creek, CA: AltaMira Press.

Ciocirlan, C. E. (2008). Analysing preferences towards economic incentives in combating climate change: A comparative analysis of U.S. states. *Climate Policy, 8,* 548-568.

Clinton Climate Initiative (2010). *C-40 cities, Clinton Climate Foundation*. Retrieved from http://www.c40cities.org/

COAST (2010). *Unmet transit needs*. Retrieved from http://coast-santabarbara.org/unmet-transit-needs/

Cohen, Stewart (2010). From observer to extension agent—Using research experiences to enable proactive response to climate change. *Climatic Change, 100*, 131–135.

Cooperrider, D., Sorensen, P., Whitney, D. & Yaeger, T. (2000). *Appreciative inquiry: Rethinking human organization toward a positive theory of change.* Champaign, IL: Stipes.

Corfee-Morlot, J., Kamal-Chaoui, L., Donovan, M., Cochran, I., Robert, A., & Teasdale, P. (2009). *Cities, climate change and multilevel governance*. (OECD Environment Working Papers.) Retrieved from http://www.oecd.org/dataoecd/30/35/44232263.pdf

Cornell University (2007). *Student activities office*. Retrieved from http://sao.cornell.edu/SO/org/07-08/1265

Coulomb Technologies (2010). *Bellevue, Washington unveils first of hundreds of chargepoint charging stations for electric vehicles*. Retrieved from http://www.coulombtech.com/pr/news-press-releases-2010-1119.php

Covin, J.G. & Miles, M.P. (1999). Corporate entrepreneurship and the pursuit of competitive advantage. *Entrepreneurship Theory and Practice, 23,* 47-63.

Cwiklik, J. S. (2007). The story behind the numbers: How and why the appreciative inquiry summit process transforms organizational cultures. *Dissertation Abstracts International*: *Section A. Humanities and Social Sciences*, *67*(8-A), 3056.

Davis, S., Caldeira, K., & Matthews, H. (2010). Future CO_2 emissions and climate change from existing energy infrastructure. *Science, 329*5, 1330-1333.

Dick, R. (2002, February). *Doing good action research*. Paper presented at a seminar at Southern Cross University, New South Wales, Australia.

Dimitrov, R. S. (2010). Inside Copenhagen: The State of Climate Governance. *Global Environmental Politics 10*, 18-24.

Duerksen, C. (2008). *Saving the world through zoning: Planning the city of Seattle*. Retrieved from http://www.cityofseattle.net/climate/

Ecotality (2010). *ECOtality's eTec awarded $100 million for transportation electrification.* Retrieved from http://www.ecotality.com/newsletter/080509_DOE_Ecotality_eTec.html

Eisler, Riane (1987). *The Chalice and the blade: Our history, our future.* Harper Collins: New York, NY.

EV Project (2010). *Overview: The EV Project is the largest deployment of electric vehicles and charge infrastructure in history*. Retrieved from http://www.theevproject.com/overview.php

Ewing, R., Bartholomew, K., Winkelman, S., Walters, J. & Chen, D. (2008). *Growing cooler: The evidence on urban development and climate change.* Washington, DC: Urban Land.

Feagin J, Orum A, Sjoberg G, (Eds.). (1991). *A case for the case study*. Chapel Hill, NC: The University of North Carolina Press.

Feinberg, B., Ostroff, C. & Warner, W. Burke (2005). The role of within-group agreement in understanding transformational leadership. *Journal of Occupational and Organizational Psychology, 78*, 471–488.

Gearty, Margaret (2008, Summer). Achieving Carbon Reduction: Learning from stories of vision, chance, and determination. *The Journal of Corporate Citizenship,* 81.

Geiselman, B. (2008). King County station is nation´s greenest. *Waste News, 14*, 12.

Gerdes, J. (2009). *COP15 daily brief: The Copenhagen accord*. Retrieved from http://www.copenhagenclimatecouncil.com/get-informed/news/cop15-daily-brief-the-copenhagen-accord.html

Gillespie, M. (2001). *Americans favor alternative energy methods to solve shortages.* Washington, DC: The Gallup Organization.

Greenwood, D. & Levin, M. (2007). *Introduction to Action Research.* Thousand Oaks, CA: Sage.

Gustavsson, E., Elander, I. & Lundmark., M. (2009). Multilevel governance, networking cities, and the geography of climate-change mitigation: Two Swedish examples. *Environment and Planning C: Government and Policy, 27* (1), 59-74.

Hall, N., Taplin, R. & Goldstein, W. (2010). Empowerment of individuals and realization of community agency: Applying action research to climate change responses in Australia. *Action Research, 8* (1), 71-91.

Hamilton, K., Sjardin, M., Shapiro, A. & Marcello, T. (2009). *Fortifying the foundation: State of the voluntary carbon markets 2009*. Retrieved from http://www.ecosystemmarketplace.com/documents/cms_documents/StateOfTheVoluntaryCarbonMarkets_2009.pdf

Hancock, L. (2007). Cutting carbon emissions: Community-focused demand management strategies for greenhouse gas abatement. *Just Policy: A Journal of Australian Social Policy, 46*, 78-89.

Hansen, H., Ropo, A., & Sauer, E. (2007). Aesthetic Leadership. *The Leadership Quarterly, 18*, 544–560.

Harrison, K. & McIntosh-Sundstrom, L. (2007). The comparative politics of climate change. *Global Environmental Politics, 7* (4), 1-18.

Hawken, P. (2010). *Global oneness project.* Retrieved from http://www.globalonenessproject.org/videos/paulhawkencomplete

Henning, A. (2008). The illusion of economic objectivity: Linking local risks of credibility loss to global risks of climate change. *Journal of Risk Research, 11*, 223-235.

Herr, K. & Anderson, G. (2005). *The action research dissertation: A guide for students and faculty*. Thousand Oaks, CA: Sage.

Hill, S. (2002). Fixing elections: The failure of America's winner-take-all politics. *National Civic Review, 91*, 193–200.

Hirokawa, K. (2009). The relevance of land use law to climate change preparedness: The case of sustainable water practices. *Trends, 40* (5), 6-7.

Hourcade, J. C., Jaccard, M., Bataille, C. & Ghersi, F. (2006). Hybrid modeling: New answers to old challenges. *The Energy Journal, 1,* 1-12.

Huxham, C. & Vangen, S. (2000). Ambiguity, complexity, and dynamics in the membership of collaboration. *Human Relations, 53,* 771-801.

Huxham, C. & Vangen, S. (2003). Researching organizational practice through action research: Case studies and design choices. *Organizational Research Methods, 6,* 383-403.

ICLEI (2009). *CCP participants, ICLEI global programs*, Retrieved from http://www.iclei.org/index.php?id=809

ICLEI (2006). ICLEI international progress report: Cities for climate protection. Retrieved from http://www.iclei.org/documents/USA/documents/CCP/ICLEI-CCP_International_Report-2006.pdf

ICMA (2010). *Sustainability survey results*. Retrieved from http://icma.org/en/icma/knowledge_network/documents/kn/Document/301646/ICMA_2010_Sustainability_Survey_Results

IISD (2010). *Better living for all – sustainably: Your guide to the International Institute for Sustainable Development.* Retrieved from http://www.iisd.org/pdf/2010/brochure_iisd_general.pdf

IPCC (2007). *IPCC fourth assessment report: Climate change 2007.* Retrieved from http://www.ipcc.ch/publications_and_data/ar4/wg1/en/contents.html

IPCC (2010). *IPCC special report on renewable energy sources and climate change mitigation (SRREN).*Retrieved from http://www.ipcc.ch/pdf/press/ipcc_leaflets_2010/ipcc_srren_leaflet.pdf

Jänicke, M., Klaus, J. (2004). Lead markets for environmental innovations: A new role for the nation state. *Global Environmental Politics, 4,* (1) 29-46,

Kamal-Chaoui, L. and Robert, A. (Eds.). (2009). Competitive cities and climate change. *OECD Regional Development Working Papers* (No 2), OECD.

Katz, B., Muro, M. & Bradley, J. (2009). Miracle mets: Our fifty states matter a lot less than our 100 largest metro areas. *Democracy Journal, Spring, 2009,* 22-35.

Kemmis, S. (1982). *The action research reader*. Victoria, Australia: Deakin University Press.

Kemmis, S., & McTaggart, R. (1987). *The action research planner.* Victoria, Australia: Deakin University Press.

Kern, K. & Bulkeley, H. (2009). Cities, Europeanization and multi-level governance: Governing climate change through transnational municipal networks. *Journal of Common Market Studies, 47,* 309–332.

King County (2001). *King County comprehensive solid waste management plan.* Retrieved from http://your.kingcounty.gov/solidwaste/facilities/cedarhills.asp

King County (2007a). *Preparing for climate change: A guidebook for local, regional, and state governments.* Retrieved from http://www.cses.washington.edu/db/pdf/snoveretalgb574.pdf

King County (2007b). *King County 2007 climate plan*. Retrieved from http://your.kingcounty.gov/exec/news/2007/pdf/climateplan.pdf

King County (2007c). *King County proposes global warming action plan*. Retrieved from http://your.kingcounty.gov/exec/news/2007/0207warming.aspx

King County (2010a). *Constantine unveils commitments for more than 125 electric vehicle charging stations throughout King County*. Retrieved from http://www.kingcounty.gov/exec/news/release/2010/September/20PlugIn.aspx

King County (2010b). *Electric vehicles: Prepare to "plug in" to a new era of travel*. Retrieved from http://www.kingcounty.gov/transportation/kcdot/keyinitiatives/ElectricVehicles.aspx

King County (2010c). *2009 Climate report. King County interdepartmental climate team.* Retrieved from http://your.kingcounty.gov/dnrp/climate/documents/2009_King_County_Climate_Report.pdf

Knuth, S., Nagle, B. Steuer, C. & Yarnal, B. (2007). Universities and climate change mitigation: Advancing grassroots climate policy in the US. *Local Environment: The International Journal of Justice and Sustainability, 12,* 485-504.

Kofman, F. & Senge, P. (1993). Communities of commitment: The heart of learning organizations. *Organizational Dynamics, 32* (5), 5-23.

Kolb, D. and Boyatzis, R. (1970). Goal setting and self-directed behavior change. *Human Relations, 23,* 439-57.

Komarudini, H., Hasantohaii, A., Putu, N., Syamsuddiniv, O. & Irawanv, D. (2006, June 19-23). *Participatory action research and its application in district government settings. Survival of the commons: Mounting challenges and new realities.* Paper presented at the Eleventh Conference of the International Association for the Study of Common Property, Bali, Indonesia.

Kotter, J. (2007, January). *Leading change: Why transformation efforts fail*. Retrieved from http://hbr.org/2007/01/leading-change/ar/1

Kousky, C. & Schneider, S. (2003). Global climate policy: will cities lead the way? *Climate Policy, 3,* 359-372.

Krajnc, A. (2003). "Can do" and "can't do" responses to climate change. *Global Environmental Politics 3* (4), 98-108.

Lewin, K. (1946). Action research and minority problems. *Journal of Social Issues, 2*(4), 34-46.

Lewin, K. (1958). *Group decision and social change*. New York, NY: Holt, Rinehart and Winston.

Lundqvist, L. & Biel, A. (2007). *From Kyoto to the town hall: Making international and national climate policy work at the local level.* Retrieved from http://www.earthscan.co.uk/?tabid=1162

Lundqvist, L. & von Borgstede, C. (2008). Whose responsibility? Swedish local decision makers and the scale of climate change abatement. *Urban Affairs Review, 43,* 299-324.

Lykes, M.B. & Coquillon, E. (2006). Participatory and action research and feminisms: Towards transformative praxis. In Sharlene Hesse-Biber (Ed.), *Handbook of Feminist Research: Theory and Praxis* (pp.297-326). Thousand Oaks, CA: Sage.

Margoluis, R., and N. Salafsky (1998). *Measures of success: Designing, managing, and monitoring conservation and development projects.* Washington, DC: Island Press.

McTaggart, R. (1989). *16 tenets of participatory action research.* Retrieved from http://www.caledonia.org.uk/par.htm

McTaggart, R. (1997). *Participatory action research: International contexts and consequences.* Albany, NY: State University of New York Press.

Meadows, D. & Wright, D. (2008). *Thinking in systems: A primer.* White River Junction, Vermont: The Chelsea Green Publishing Company.

Monni, S., F. Raes (2008). Multilevel climate policy: The case of the European Union, Finland, and Helsinki. *Environmental Science and Policy, 11,* 743-755.

Moser, S.C. and L. Dilling, (Eds.). (2007). *Creating a climate for change: Communicating climate change and facilitating social change.* Cambridge, UK: Cambridge University Press.

Müller, B. (2002). *Equity in climate change: The great divide.* Retrieved from http://www.oxfordenergy.org/pdfs/EV31.pdf.

NACO (2010). *Examining county sustainability strategies in 2010. The National Association of Counties.* Retrieved from http://admin.naco.org/programs/csd/Documents/Green%20Government/2010%20County%20Sustainability%20Strategies.pdf

Norberg, J. & Cumming, G. (Eds.). (2008). *Complexity theory for a sustainable future.* New York, NY: Columbia University Press.

O'Brien, R. (2001). *An Overview of the Methodological Approach of Action Research*. Retrieved from http://www.web.ca/~robrien/papers/arfinal.html

Okereke, C., Bulkeley, H. & Schroeder, H. (2009). Conceptualizing climate governance beyond the international regime. *Global Environmental Politics, 9* (1), 58-78.

Okubo, T. & Kurosawa, K. (2003). A relational theory approach to social motivation. *Japanese Psychological Review, 46* (1), 12-23.

O'Neill, J. (2008). *Cities show the way on delivering a sustainable spatial planning vision*. Retrieved from http://eprints.ucl.ac.uk/10828/1/10828.pdfs

Opinion Research Corporation (2006). *Global warming & alternative energy: A leadership survey*. Retrieved from http://etownpanel.com/documents/SpecialReport_12_September2006.pdf

Ostrom, E. (2009). *A polycentric approach for coping with climate change*. Retrieved from http://www.iclei.org.mx/web/uploads/assets/Documentos/Ostrom_A_polycentric_approach_for_coping_with_climate_change__1_.pdf

O'Toole, J. (1995). *Leading change: Overcoming the ideology of comfort and the tyranny of custom.* San Francisco, CA: Jossey-Bass.

O'Toole, J. (1999). *Leadership a to z: A guide for the appropriately ambitious*. San Francisco, CA: Jossey-Bass.

Pan, J. (2003). The Impact of a mitigation of climatic change on the economies and politics of different regions. *World Economics and Politics, 6*, 66-71.

Peat, F. David (2008). *Gentle action: bringing creative change to a turbulent world*. Tozzi, Italy: Pari.

Pew Center on Global Climate Change (2009). *Climate change 101: Local action*. Retrieved from www.pewclimate.org

Poteete, A., Janssen, M. & Ostrom, E. (2010). *Working together: Collective action, the commons, and multiple methods in practice.* Princeton, NJ: Princeton University Press.

Pretty, J. N. (1994). Alternative systems of inquiry for sustainable agriculture. *IDS Bulletin, 25* (2), 37-48.

PSCAA Climate Protection Advisory Committee (2004). *Roadmap for climate protection: Reducing greenhouse gas emissions in Puget Sound*. Seattle, WA: Puget Sound Clean Air Agency.

PSCAA (2007). *Regional emissions inventory*. Seattle, WA: Puget Sound Clean Air Agency,

Qi, Y., Ma, L. Zhang, H. & Li, H. (2008). Translating a global issue into local priority: China's local government response to climate change. *The Journal of Environment & Development, 17*, 379-400.

Rahman, A. (1985). *The theory and practice of participatory action research*. Retrieved from http://bdeconassoc.org/userfiles/pdf/2%20Gonogobeshona_in_Bangladesh_etc%20Anisur%20Rahman.pdf

Reason, P. and Bradbury, H. (Eds.). (2008). *Handbook of action research.* London, UK: Sage.

Reay, Dave (2008). Greenhouse gas. Retrieved from http://www.eoearth.org/article/Greenhouse_gas

Rice, J. (2008). *Picking the low hanging fruit: State transformation, state practice, and sub-national climate governance in the United States.* Tucson, AZ: University of Arizona, School of Geography and Development.

Roberts, Mike (2008). *Local lead on carbon emissions key to bringing planet back from brink*. Retrieved from http://www.rtpi.org.uk/download/5329/Issue-126-081218-ScotPlanner-Dec08-final-electronic-version.pdf

Salet, Willem (2006). Rescaling territorial governance: The responsiveness of spatial and institutional strategies to changing socio-economic interactions. *European Planning Studies, 14*, 959-978.

Salk, Jonas (1983). *Anatomy of reality: merging of intuition and reason.* New York, NY: Columbia University Press.

Salkin, P. (2009). New York local governments respond to climate change and energy efficiency. Retrieved from papers.ssrn.com/sol3/Delivery.cfm/SSRN_ID1371950_code83276.pdf?...

SBI Energy (2010a). *Electric vehicle (EV) infrastructure manufacturing*. (Pub ID: SB2441322). SBI Energy.

SBI Energy (2010b). Electric vehicle (EV) and plug-in hybrid electric vehicle (PHEV) markets worldwide. (Pub ID: SB2496608). SBI Energy.

Senge, P. M. (1990). *The fifth discipline: The art and practice of the learning organization.* New York, NY: Doubleday.

Senge, P. M. (1999). *The dance of change: The challenges to sustaining momentum in learning organizations.* New York, NY: Doubleday.

Stake, R. E. (1995). *The art of doing case study research.* Thousand Oaks, CA: Sage.

Stern, H. (2008). A necessary collision: Climate change, land use, and the limits of A.B. 32. *Ecology Law Quarterly, 35*, 611-637.

Sugiyama, N. & Takeuchi, T. (2008). Local policies for climate change in Japan. *The Journal of Environment & Development, 17*, 424-441.

Sustainable Cities (2010). *Copenhagen: Waste-to-energy-plants. Danish Architecture Center*. Retrieved from http://sustainablecities.dk/en/city-projects/cases/copenhagen-waste-to-energy-plants

Tang, Z., Brody, S., Quinn, C., Chang, L. & Wei, T. (2010). Moving from agenda to action: Evaluating local climate change action plans. *Journal of Environmental Planning and Management 53*(1), 43-62.

The Climate Registry (2010). About the climate registry. Retrieved from http://www.theclimateregistry.org/

Thomsen, A. M., Perry, J. L. & Miller, T. K. (2009). Conceptualizing and measuring collaboration. *Journal of Public Administration Research and Theory, 19* (1), 23-56.

Tjernshaugen, A. (2005). *United States participation in future climate agreements: An assessment.* Center for international climate and environment research. Retrieved from http://www.cicero.uio.no/media/3312.pdf

United Nations (2009). *World economic and social survey 2009: Promoting development, saving the planet.* New York, NY: Department of Economic and Social Affairs.

United Nations (2010). *Music as a natural resource: Solutions for social and economic issues*. Retrieved from http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan042585.pdf

Urpelainen, J. (2009). Explaining the Schwarzenegger phenomenon: Local front runners in climate policy. *Global Environmental Politics, 9* (3), 82-105.

US Census Bureau (2009). *American community survey*. Retrieved from http://www.census.gov/acs/www/data_documentation/2009_acs_maps/

US Conference of Mayors (2009a). *Taking local action: Mayors and climate protection best practices.* Retrieved from http://www.usmayors.org/climateprotection/documents/2010-mcpc-bestpractices.pdf

US Conference of Mayors (2009b). U.S. conference of mayors climate protection agreement. Retrieved from http://www.usmayors.org/climateprotection/agreement.htm

Vail, J. (2004). *A theory of power*. Retrieved from http://www.jeffvail.net/2005/03/theory-of-power-online.html

Van Oosten, E. (2006). Intentional change theory at the organizational level: A case study. *Journal of Management Development, 25*, 707-717.

Varro, K. (2010). *After resurgent regions, resurgent cities? Contesting state geographies in Hungary and England.* (Doctoral Dissertation,Radboud University). Retrieved from repository.ubn.ru.nl/bitstream/2066/84456/1/84456.pdf

Victoria Transport Policy Institute (2010). *Road pricing: Congestion pricing, value pricing, toll roads and HOT lanes.* Retrieved from http://www.vtpi.org/tdm/tdm35.htm

Waddell, D., Cummings, T. & Worley, C. (2007). *Organization development and change.* Retrieved from www.ebookfree-download.com/.../cummings-and-worley-pdf.php

Washington State Department of Commerce (2010). *Electric vehicle infrastructure: A guide for local governments in Washington State.* Retrieved from http://docs.google.com/viewer?a=v&q=cache:xI2xvOvdL-UJ:www.commerce.wa.gov/DesktopModules/CTEDPublications/CTEDPublicationsView.aspx%3FtabID%3D0%26ItemID%3D8851%26MId%3D863%26wversion%3DStaging+Washington+State+Department+of+Commerce+(2010).+Electric+vehicle+infrastructure:+A+guide+for+local+governments+in+Washington+State.&hl=en&gl=us&pid=bl&srcid=ADGEEShEkhJ3RguYRMBKu0Xo2qUQasbeDPttp6AaB9Ty-HNJF2wxq2fu7CNCqh-HBWS3BgcKAx1oRyLEq64UWGPPeRzEFvXBwqDY5d2gvx74YjKvkTC2LJ6kD7tE_EZ8XFei1KTHrhKV&sig=AHIEtbSRBMyrgjiEAb0mXIxYgNnMD23gSg

Washington State Department of Transportation (2010). *Electric vehicle highway.* Retrieved from http://www.wsdot.wa.gov/News/2011/01/firstElectricVehicleHighway.htm

Wasserman, S. and K. Faust (1994). *Social Network Analysis.* Cambridge, MA: Cambridge University Press.

Wheeler, S. (2008). State and municipal climate change plans: The first generation. *Journal of the American Planning Association, 74,* 481-496.

Wood D. & Gray B. (1991). Towards a comprehensive theory of collaboration. *Journal of Applied Behavioral Science. 27,* 139-62.

Yedla, S., Shrestha, R. & Anandarajah, G. (2005). Environmentally sustainable urban transportation – comparative analysis of local emission mitigation strategies vis-à-vis GHG mitigation strategies. *Transport Policy, 12,* 245-254.

Yin, Robert (2009). *Case study research: Design and methods.* (4th ed). Thousand Oaks, CA: Sage.

Zahran S, Brody S.D., Vedlitz A., Grover H. & Miller C. (2008). Vulnerability and capacity: Explaining local commitment to climate-change policy. *Environment and Planning C: Government and Policy, 26,* 544-562