



# **Recommendations for Sustaining Sustainability Initiatives in City Government**

**Service Learning project in  
PUAD 837 Resource Allocation and Control  
University of Kansas  
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## Executive Summary

Environmental sustainability has been a topic on the forefront of local, state, national, and international governments in recent years. As the world continues to deplete its natural and environmental resources, governments are working to develop programs, opportunities, and initiatives that are to the benefit of the environment, their constituents, and also, financial bottom lines.

As governments plan programmatic change and develop “green” initiatives promoting sustainability, they should consider the cost of sustaining such initiatives along with diverse financing alternatives. This report analyzes four cities that, according to Siemens’ US and Canada Green City Index (2011), demonstrate excellence as four of the top five cities in North America in 2011 for environmental sustainability initiatives. Each city offers different programs using a variety of financing mechanisms, and is distinct in their financial presentation. The cities and some of their sustainability program areas of excellence are:

- Denver, Colorado: Water, Energy, Environmental Governance
- New York City, New York: Waste, Air Quality, Water
- San Francisco, California: Waste, Air Quality, Green Buildings
- Seattle, Washington: Green Buildings, Waste, Environmental Governance

Our analysis of these four cities’ successes and additional research show that to develop and maintain sustainability initiatives, city governments often become involved as champion, regulator, developer, fee collector, and financier. They must also be able to gauge the sentiment of constituents for support of these issues. Excellence is demonstrated by a city developing an overall sustainability plan, developing a strong sense of political acceptability and support from constituents and stakeholders, and additionally, providing the proper funding mechanisms to start and maintain these initiatives. This report compares and contrasts the four cities’ strategies and approaches in selected sustainability initiatives, and provides specific financing and program strategy recommendations that other “green” cities may follow so that local sustainability initiatives can be more financially sustainable in the long run given the fiscal environment faced by many governments today.



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## Introduction

In spring 2011, a project team of 10 University of Kansas Masters in Public Administration students was assigned to a service learning project that analyzed how local governments may finance various sustainability initiatives more effectively in today's fiscal environment. The project team analyzed four cities that ranked exemplary in their sustainability initiatives by Siemens in collaboration with the Economist Intelligence Unit in 2011. These cities were Denver, New York, San Francisco, and Seattle. The most recent Comprehensive Annual Financial Reports (CAFRs) of these four cities that were publicly available were analyzed to develop an understanding of the financial state and health of each city. Additionally, the project team conducted research via the internet and personal interviews to learn more about each city's sustainability efforts, major sustainability initiatives, and each city's funding sources and mechanisms for paying for these sustainability efforts. Based on the research results and lessons drawn from the four cities' successes, core class concepts and academic research from PUAD 837 (Resource Allocation and Control) at the University of Kansas were applied to the findings to develop recommendations for cities that are interested in supporting and funding sustainability initiatives from the perspective of financial responsibility. The findings of this report were presented to officials of Johnson County, Kansas in May 2012 for their information and policy development consideration.

## Summary of Cities and Sustainability Programs, Financial Analysis, and Demographics

Each of the four cities analyzed have strong sustainability programs, consistent with their rankings at the top of the Siemens report (2011) of "Green Cities". Below is a high-level summary of each city, its financial condition, and its top sustainability initiatives. Detailed information about the aforementioned factors for each city is located in each city's respective appendix.

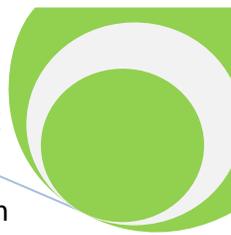
### Denver, Colorado



Located in the western half of the US, Denver, Colorado is a major metropolitan area with close access to mountains, lakes, and rivers. Denver ranked fifth on Siemens' US and Canada Green City Index (2011). Denver has a strong sustainability culture and influence amongst its residents and community.

An analysis of Denver's 2010 CAFR reveals that it is a healthy city that is financially stable. It has managed its resources well through the recent economic downturn and in general, relies mostly on itself for funding, and less on outside grants and partnerships.

Like the other cities analyzed in this report, Denver ranks well in several of the categories analyzed in the Siemens 2011 report. However upon analysis, its strongest



sustainability programs are those related to energy, water, and environmental governance, in which it placed first of all major US and Canadian cities. Detailed information regarding Denver's financial health and its sustainability initiatives is located in Appendix A.

### **New York City, New York**

New York City, New York, the most populous city in North America, is located on the northeastern coast of the United States. New York City ranked third in Siemens' 2011 Green City Index. New York City, located near oceans and a short driving distance from mountains and rural areas, faced many challenges in structuring itself as a city focused on sustainability.



An analysis of New York's 2011 CAFR shows that the city holds a substantial amount of debt, and inadequate cash solvency for the long term, but that it would be able to meet its short term obligations if necessary.

New York City scored well in many categories of the report, among which were its sustainability programs related to air quality, water, and energy consistently ranked highest. Detailed information about these sustainability programs and the city's financial picture is located in Appendix C.

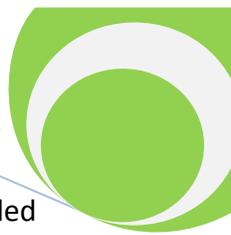
### **San Francisco, California**



San Francisco, California is a major, populated city located on the west coast of the United States. San Francisco ranked first in the 2011 Siemens Green City Index of all 27 cities analyzed in the US and Canada. San Francisco has long been known for its access to oceans, mountain, forestry, and its promotion of a green or sustainable culture amongst its residents.

An analysis of San Francisco's 2011 CAFR revealed that it is a financially stable and healthy community. However, a concern in San Francisco's financial picture is that if there were to be a financially catastrophic event, San Francisco may not have adequate reserves to recover quickly from such an event.

San Francisco's top ranked sustainability initiatives and programs are related to waste, air quality and "green" buildings. They are serving San Francisco well and are a model for other



cities. Detailed information on these initiatives and San Francisco's financial status are included in Appendix C.

### **Seattle, Washington**

The city of Seattle, Washington is a major U.S. city located in the upper northwest portion of the United States. Seattle's geographic location, near mountains, ocean, and forestry, makes it an ideal place to live for those who would want access to the amenities of a major metropolitan area, but also enjoy the ability to have natural resources to explore nearby.

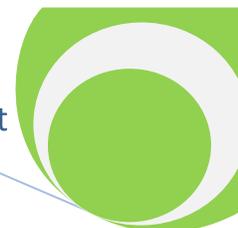


An analysis of Seattle's 2011 CAFR revealed that Seattle is a financially stable and healthy community. Its revenues exceeded its expenses, its enterprise funds operate at a stable level, bringing in more operating revenues than spending. In addition, the City has positive unrestricted net assets which would provide for any unplanned occurrence or emergency. Reliance on external grants and financial support is also healthy – only about 8% of their revenues.

Seattle ranked fourth overall of major cities in the US and Canada in the Siemen's rankings. Seattle has several strong sustainability programs, but its highest rankings in individual categories were found in its strong initiatives of green buildings, energy, and environmental governance. Detailed information about these initiatives, and Seattle's financial state, is located in Appendix D.

### **At-a-Glance Financial and Demographic Comparison of Cities**

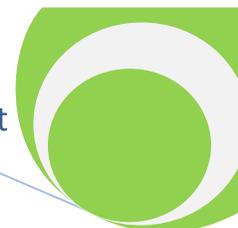
The following table compares the financial condition of each city at a high-level of detail. Detailed information about each city's financial state can be found in each city's respective appendix.


**Table 1: City Financial Comparison**

	Denver	New York	San Francisco	Seattle
Total Assets	\$9,399,170,000	\$15,455,844,000 Component Units	\$20,507,491,000	\$9,505,089,000
Total Assets – Governmental Activities	\$3,992,597,000	\$78,272,683,000	\$5,602,897,000	\$4,398,281,000
Total Liabilities	\$6,680,713,000	\$15,515,590,000 Component Units	\$14,268,120,000	\$5,310,459,000
Total Liabilities – Governmental Activities	\$2,385,091,000	\$196,277,747,000	4,292,588,000	\$1,614,066,000
Current Ratio	2.1	1.16	1.95	2.83
Quick Ratio	2.1	1.13	1.938	3.7
Long Term Debt Ratio	0.46	2.16	.5748	.3107
Net Assets Per Capita	\$2,706.4	(\$14,061.81)	\$1,647.66	\$4,549.37
Unrestricted Net Assets Per Capita	\$380.90	\$1.46	(\$1,613.41)	\$153.04
Aggregate Return on all net assets of all enterprise funds	(\$0.03)	(\$0.01)	\$0.04	\$.08
Own Source	0.83	0.61	0.71	0.92

Denver, Colorado has a population of 600,158. The financial analysis for the city shows that it is fiscally healthy. Denver is financially solvent and is able to meet its long term obligations and has good liquidity. Additionally, it has a high ratio of net assets per capita, which continues to be a good solvency indicator. Approximately 83% of Denver's funds are self-generated; however, this may indicate that the city relies heavily on outside funding sources, such as grants, contributions, or monies from state and local governments.

New York City, New York is currently facing significant financial challenges. Inadequate cash solvency could cause the city complications and vulnerability should it encounter a need to pay off its liabilities immediately. Further, New York carries a significant amount of debt, as is demonstrated by its very high long term debt ratio. New York currently has negative net assets per capita, putting many programs at potential risk for being cut. Finally, New York only generates 69% of its own revenues, indicating that it relies heavily on funding from outside sources and may be more vulnerable to fiscal shocks from other levels of government.



San Francisco, California has a population 795,238. The financial analysis for the city shows that it is fiscally healthy, but that improvements are needed. San Francisco has good liquidity and has the ability to meet its financial obligations. It is financially solvent and is able to meet its long term obligations. San Francisco has a high ratio of net assets per capita which is also a good solvency indicator. Unrestricted net assets per capita are negative, which indicates high debt and the lack of flexibility to move finances. San Francisco is fairly self-sufficient at generating its own revenues, but does have room for improvement. Its ratio of generating 88% of its own revenues is strong. However, the ideal percentage of own source revenues generated is 90%.

Seattle, Washington appears to be a financially stable and healthy community. Its revenues exceeds its expenses, its business activities operate with consistency and bring in more revenue than the amount of outgoing expenses. Should the city encounter any type of unplanned event that would require a great financial commitment, it could fund it with its unrestricted cash assets. Also, the city relies very little on outside revenue sources, meaning that most of its revenue is generated from its own activities.

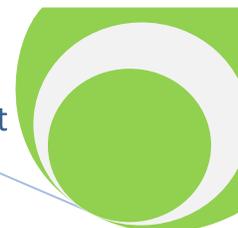
Table 2 provides a high-level view of select demographics for each city.

**Table 2: City Demography Comparison**

	Denver	New York	San Francisco	Seattle
Population	600,158	8,391,881	795,238	612,000
Average Personal Income	\$51,630 (2009)	\$48,619	\$75,372	\$56,904
Unemployment Rate	8.9%	9.5%	9.2%	8.3%
Median Age	36.8	35.9	38.5	37.2

### Financing Mechanisms for Sustainability Programs

The analysis of Denver, New York, San Francisco and Seattle show that each city has different ways of financing its sustainability efforts. In some cases, a city may rely more heavily on user fees and charges, whereas others may focus financing efforts on obtaining funding from partnerships with local businesses. Although each city may have diversified its financing methods amongst differing mechanisms, each city consistently used -- federal and state grants for sustainability efforts. Clean air and water and reduced depletion of natural resources are often national or regional public goods jointly consumed by residents and are non-excludable. An investment in these environmental goods often requires a long-term, multi-generational perspective, and federal and state financial involvement which is justifiable and necessary.



Alternatively, there are some other financing mechanisms presented in this comparative analysis that can be used by cities to support sustainability initiatives. Table 3 provides some examples of these mechanisms.

**Table 3: Financing Mechanisms for Cities Analyzed**

Financing mechanisms	New York	San Francisco	Denver	Seattle
<b>User Financing</b>				
Service Charges	Water	Solid Waste	Water	Water Solid Waste Sewage
License or Permit Fees		Green Buildings	Water	Green Buildings
Regulation (i.e., shifting the costs to users)	Water	Solid Waste	Water	
<b>City's Own-Source Funding or Financial Support</b>				
Regular Program Funding by City Departments	Many	Green Buildings	GreenPrint	Green Buildings/ Governance
Specific Public Procurement Policies				
Provision of City Grants to Nonprofits or Businesses			GreenPrint	Green Buildings/ Governance
Tax Incentives for Users or Businesses (i.e., tax revenues forgone)		Air Quality		Green Buildings/ Governance
Public Debt Financing	Many	Green Buildings		
<b>Intergovernmental Funding</b>				
State Grant Programs	Clean Air	Green vehicles	GreenPrint	Green Buildings/ Governance
<b>Financing mechanisms</b>	<b>New York</b>	<b>San Francisco</b>	<b>Denver</b>	<b>Seattle</b>
Federal Grant Program	Clean Air	Green vehicles	GreenPrint	Green Buildings/ Governance



Partnership with Nonprofits or Community Organizations				
Community Donation				Governance
Volunteer Program by the Community or Neighborhood Associations			GreenPrint	Green Buildings/ Governance
Other				
Partnership with Businesses				
Company Donation			GreenPrint	
Incentives Offered by Companies to Users (e.g., utility companies)		Solid Waste	Xcel Energy	Green Buildings/ Governance
Discount Offered by Contractors or Suppliers				X-Green Buildings
Venture Capital Financing				
Partnership with Other Governmental Entities				
Partnership with Public Schools				Governance
Partnership with Other Cities				Governance
Partnership with the County	Clean Air			Green Buildings/ Governance
Partnership with State Agencies	Clean Air	Air Quality	GreenPrint	Green Buildings/ Governance
Other Mechanisms				
A revolving fund or trust fund started by government seed money, but is sustained by service charges, fees.				
Market Creation for Users or Businesses	Solid Waste			
Creation of Information Exchange for Users or Businesses				Green Buildings/ Governance
Social Marketing or Public Relations Campaign			GreenPrint	Green Buildings/ Governance
Business Development Initiatives	Solid Waste		GreenPrint	



### Sustainability Programs

Each of the cities studied did not rely on private sector markets alone to initiate their sustainability programs. This is understandable given that private sector markets seek profitability and many sustainability programs do not offer significant profits. As a result, sustainability programs tend to be led by government actions or intervention. This is reasonable because environmental assets are not typically owned or enjoyed individually, but by society as a whole. It is difficult to exclude someone in a community from enjoying the resulting benefits even if they have not paid for the services and programs. Also, there is externality effects placed on society and there is a need for those effects to be managed regionally or nationally. Even in cases where a sustainable program does involve a private good, the return on investment for that private good may not consist entirely of monetary value. Instead it may be intermixed with community values and “moral goods”. For example, San Francisco’s transit bus system could arguably be a private good because its service can be excludable to those that pay and each paid ride is consumed by a single passenger. However, this service also has non-excludable social benefits and provides significant community value that deserves public investment. For example, it reduces the number of cars on the road and the volume of exhaust emissions polluting the environment. As a result, some form of government involvement is justifiable as social benefits related to providing low cost public transportation or clean air are not necessarily incentives for private markets to invest or become involved.

Sustainable energy programs are another example where market failures occur and government involvement is necessary to maintain them. Efficient use of energy lowers the investment costs private firms or public agencies put into providing goods and services. In this context, sustainable energy programs provide their own incentive to exist. Private firms, public agencies and the public at large will voluntarily take action or make investments to reduce their energy consumption and with it reduce their energy costs. However, there are also social benefits, such as clean air, that are extended beyond individual consumption gains. As inferred earlier, the societal benefits of clean air fuels may not be something the free market values and it will be up to government to promote it. Hybrid cars are a prime example where government agencies purchase them and put them into service to exemplify stewardship to their energy programs despite higher operating costs.

Government’s involvement with sustainable programs can take several forms. As with San Francisco’s bus system, a government entity may provide a good or service similar to what a private sector company may do. Governments also may provisionally fund a good or service. A community may decide to have its transit bus service operated by a private company, but may subsidize part of the operating costs to compensate for the externality effects and social benefits. Mechanisms including grants, tax breaks and capital improvement investments can be used to provide these subsidies. For example, the City of Denver, as part of its sustainability programs, provides block grant funding to businesses and residents for upgrading building energy efficiencies. San Francisco gives tax breaks to commuters using mass transit, whom are allowed to write off a certain portion of their transportation costs against their city taxes. Some



government agencies sponsor consumer rebates on the purchase of energy efficient appliances. Investing in large capital improvements to their infrastructure is another way governments support their sustainability programs. New York funded several improvement projects to its waste water system. These projects increased the efficiency of their waste water treatment plants resulting in less water pollution.

To be most effective, sustainability programs need large scale participation. What value is there in simply having one clean burning engine or just a handful of recycled soda cans? Each of the cities studied in this report looked for their programs to have more than just a superficial presence. In most cases the cities looked at large scale behavioral changes to impact its environment. They created their programs in more than an ad-hoc fashion, giving them city wide impact potentials. Doing so increased opportunities to observe their benefits and for the communities to see value for the dollar investment. Seattle's zero waste strategy and Denver's energy conservation programs are two examples. In each of these cases the cities enacted multiple citywide strategies aimed at the same program target. In Seattle's case, it instilled user fees on those generating too much garbage and banned plastic bags and Styrofoam. It also introduced an ordinance allowing residents to limit the volume of unsolicited paper mail they received through a do not mail registry.

User fees and regulations are effective tools for changing behaviors and gaining large scale participation. User fees can be either direct charges aimed simply at capturing the cost of providing a service or an intended penalty against a specific behavior. A simple parking fee for example may target reimbursement for the costs to providing the service. A more complex parking fee may be structured to penalize long term parking. Similarly a sustainability program may seek to conserve water by monetarily penalizing those who use over a certain allotment. In these instances the user fee is tiered to make it highly more expensive the more of the service that is used. Seattle and San Francisco each employ user fees on their residential garbage service. By making garbage collection more expensive the more that is thrown away, Seattle and San Francisco hope to change consumer behavior to throw away less. To entice consumers towards recycling, Denver makes the service free by subsidizing its cost. Denver, in essence, provisionally provides recycling services through a private garbage collection company. The combination of these two establishes a penalty and reward system for changing consumer behavior.

One of the difficulties with conservation programs is that they seek to reduce consumer consumption. Where services provided by the government are consumed less and there is less government expense, the effects of conservation can be positive. Alternatively, private companies are not likely to cooperate with conservation programs which seek to reduce the consumption of goods or services they produce, unless these programs also help these companies save money, such as their capital investment needs. Operations that produce units of goods where there is a fixed operating cost are likely to be harmed by conservation efforts. For example, community water plants spread their base operating cost over the number of water units they produce and sell. Conservation efforts which reduce the amount of water consumed and sold will reduce the profitability of water operations and require an increase in



the consumer rate charges to compensate for the reduced demand. Private electrical companies are another example where the incentive is to sell more electricity. Conservation that seeks to reduce the amount of energy they sell will inherently lessen their ability to generate income and force them to raise rates. So, there are conflicts of interests for utility companies to support sustainability initiatives, unless they see that there are long-term financial benefits for them, such as delaying their needs to build a new power plant, or finding a new landfill site.

This is where government regulation can be used to create more market incentives for companies to support sustainability programs and a less consumption-driven society. Restrictions on the growth of landfills, for example, forces garbage haulers to cooperate with city initiatives on recycling and composting of yard waste. Without them there would be little incentive for garbage haulers to put much effort into making those initiatives successful. Energy companies restricted by limitations on the number of plants they can build or pollutants they can discharge are encouraged to cooperate with sustainability programs and to manage energy growth needs. Colorado's mandate that 30% of the state's energy come from alternative fuels is an example where local utility companies were encouraged to cooperate with Denver's efforts to decrease the City's overall energy use.

Solid waste programs are another area prone to government interest. At its core, garbage collection and disposal is a private good. The service can be provided to exclude those who do not pay and it can be provided in a manner where it is individually benefited. It is a profitable business, but also one where there is externality effects on the environment and the community. Garbage that is left uncollected and improperly disposed of harms the community and the natural environment. The harmful effects brought upon improperly disposing of garbage cannot be excluded to only those who caused it. The natural environment is jointly consumed by all in society and as a result it takes on a government interest to see that it is properly managed. Regulation is typically the manner in which government ensures this is occurring. Similarly, this can be found in the areas of air and water quality. All of the cities included in this report used regulation as a strategy tool. New York and San Francisco used regulation to mandate restrictions on the amount of emissions from taxi's and school buses. New York also required private parking lots to include free bicycle parking as a means of reducing car exhaust emissions by encouraging bicycle use. Additionally, New York enacted zoning laws requiring increased tree planting and green spaces in development areas.

The communities in this report ranked high in the study of their sustainability programs. One of the reasons for this is that each city led by example. They did not push sustainability as a sole responsibility to others. Instead, they embarked on their own initiatives. For example, New York is investing heavily to reduce energy consumption and lower emissions within its fleet vehicles and buildings. Seattle took a lead in mandating its city buildings to be LEED energy certified, even though this initiative has increased its facilities' operating expenses. San Francisco created a self imposed requirement for hybrid alternative fuel cars in its fleet and likewise funded their purchase. Denver's GreenPrint program sets sustainability standards not only for the community, but for itself as well.



In each of the cities that ranked high in their sustainability programs, there appears to be several common ingredients to their success. First, each enjoys support and will of the people. Citizens and business in the communities were behind the effort and thus communicate sustainability as an important issue to their representative governments. The second is that each community is located in an area with a rich natural environment. This enables the sustainability programs and their objectives to be more visible than say a smaller community with very minor natural resources and very little influence on the natural environment. Each of the communities has a culture of valuing their natural environments and having pride in their city. The sustainability programs analyzed are not top down enforcements of a government administrator rather they stem from the community's desire to protect its natural resources.

Additionally, each community is large enough to impact the environment from its operations which can be easily identified and hard to ignore. Operational change was inarguably needed if these cities were going to reduce the negative impacts they were having on the environment. The ability for each community to come to resolution on this issue helped maintain the integrity of their programs rather than allowing them to get lost in political turmoil. This point also helped each city and its citizens to sanction a belief to themselves that their programs were needed. Fourthly, each of the communities was financially stable enough that they could afford to absorb the cost of their programs. Where government added regulation the business market was solvent enough to be able to absorb the initial higher operating expenses. Likewise citizens accept the higher city service costs. In other areas businesses invested in sustainability programs or partnered with the city in investing in them.

Where provisional funding was needed the governments could provide them without immediate needs to make major choices between sustainability programs and the elimination of basic services. Whether this remains to hold true over time is not clear. Large cities with large annual debt capabilities may be able to absorb the high cost of their sustainability programs and for the short term not allow them to impact other funding needs. Many of the community's embarked on their sustainability programs prior to the down turn in the economy. As the availability of discretionary spending is lost perhaps more stringent choices between sustainability programs and city basic services will surface. Nonetheless, each of the communities absorbed the cost burdens of their programs without forcing citizens to make hard choices between them and the continuance of basic services. It is doubtful that the communities would have been as successful with their programs had they been forced to cut core service programs to accommodate them.

Finally, each community has a government that is organized and structured to promote sustainability. Although departments in each community have responsibility for various parts of the program, their efforts are coordinated through a central city sustainability office. By designating and naming an official sustainability office each community's program becomes openly visible. Each community makes sustainability a city interest and in doing so encourages the coordination and facilitation across department lines. Each community government places



emphasis on partnerships within itself, industry and the public. All this helps the success of their programs by encouraging community wide support.

### Recommendations

This report generates two types of recommendations for city officials to consider. The first set of recommendations are general in nature, and focus on planning and the coordination of efforts. The second set of recommendations is more specific, and is targeted toward budgetary and fiscal recommendations to support sustainability initiatives through the start-up of the projects, and into the future as mature, continuing initiatives.

The first recommendation for any city desiring to begin, or enhance, its sustainability initiatives, is to formulate a plan. All of the North American cities reviewed in the Siemens Green City Index have an environmental plan that guides the cities' sustainability efforts. All of the top ten in the Siemens report had an annual plan with a coordinating office (Siemens, 2011). This plan should first define sustainability in the context of the community it serves. Having defined what sustainability is within the community will allow the topic to be addressed in a transparent environment in which all parties are working under a common definition. Framing the issue in this way helps to generate discussion, draws attention to the issue, and can reduce resistance. The sustainability plan should include the charter for a single coordinating office or point of contact, as well as the environmental authority to speak for the municipality. This governance document should be signed by the city mayor, endorsed by the city council, or both.

Additionally, cities should attempt to incorporate what Denver, for example, call its "triple bottom line" analysis, seeking to balance economic, social, and environmental considerations into all city policy and program decision processes to ensure that sustainability initiatives are planned within resource limitations, social acceptability, as well as for environmental impact. The creation and support of this governance document gives the city the starting point to outline its sustainability goals, supporting objectives, and intent (GreenPrint, 2007).

The second general recommendation is to address the political acceptability or public receptiveness to sustainability initiatives. Public and political support for sustainability initiatives is very important in order for the sustainability effort to succeed. Two of the cities analyzed in this study, San Francisco and Seattle, are in the northwest part of the United States, which has strong roots in the American conservation movement. Denver also is in an area in which much of its economy comes from outdoors tourism, such as skiing, hiking, and camping. It is not difficult to imagine that the public in these cities are receptive to green initiatives and sustainability programs. In many areas of the country, this support may not be as solid, or comprehensive. To address this uncertainty, it is recommended that a city starting a sustainability program conduct a survey, either in conjunction with other surveys already



planned, or as a stand-alone, to assess the receptiveness of its public to various sustainability initiatives

In the survey, the public can be asked to rate or prioritize a list of green initiatives or issues. The survey can ask them to rate them on their importance to the public, and on their willingness to absorb some costs related to the potential programs. In this survey, the citizens can be asked for their own ideas for sustainability initiatives, or their willingness to participate, either as an individual volunteer, or as part of a neighborhood action group, in local green initiatives and awareness programs. These results can be made public in planned annual reports, or on the sustainability/conservation portion of the city's website. Through this mechanism, the level of public support for the selected initiatives can be assessed, as well as gaining the public's ideas on other initiatives for future consideration and planning.

The final general recommendation focuses on means to fund sustainability initiatives. According to the Siemens (2011), many of the cities evaluated did not try to fund their sustainability initiatives out of their own revenue sources. Instead, they sought partnerships with non-profit and private organizations with an interest in being a part of one or more sustainability programs. Additionally, these cities sought partnerships with other local and state government entities with similar goals, or where areas of geographic responsibilities touched. In today's operating environment, and the "new norm" of reduced revenue streams, fewer federal grants, and an expectation of wiser, more controlled spending by the population, forming these partnerships is crucial to creating sustainability initiatives that will be financially supportable over the long-term. Specifically, local governments should seek locally owned or businesses with long-term commitments and a sense of belonging in the community with which to partner.

When discussing these partnerships, local governments should be open to new ideas and creative means of cooperation. Many private companies spend large amounts of resources on marketing and advertising. Local governments may consider allowing companies that provide financial support to a specific initiative to advertise their brands and products. Table 4 illustrates the benefits and risks for consideration with public engagement and private or non-profit partnerships.

By forming partnerships with non-governmental entities, local governments can greatly increase the number and scope of their green initiatives. By providing a centralized point of contact or authority to coordinate efforts, the government can facilitate the programs, link parties with common goals or ideas, and help guide the various programs based upon the goals and objectives of the city's sustainability plan.

In recognizing the fiscal stress many cities are feeling under the "new normal" of reduced resources, specific budgetary or fiscal recommendations are focused on projects that do not require large amounts of new resources to initiate. These initiatives, in the areas of Green Buildings, Solid Waste Management and Recycling, and Water Conservation, are



intended to be actionable first steps to begin moving toward projects that are sustainable environmentally, economically, and socially.

**Table 4: Engagement and Partnerships Benefits and Risks**

Benefits and Risks to Public Engagement and Private/Non-Profit Partnerships		
	Benefits	Risks
Surveys/Public Participation	<ol style="list-style-type: none"> <li>1. Public buy-in to initiatives</li> <li>2. Increased input and prioritization</li> <li>3. Increased public engagement and education</li> <li>4. Information on Public fiscal priorities</li> </ol>	<ol style="list-style-type: none"> <li>1. Equity concerns on survey method</li> <li>2. Chance for apathetic response/lack of mandate</li> </ol>
Partnerships	<ol style="list-style-type: none"> <li>1. Spread the funding burden</li> <li>2. Larger pool of specific expertise</li> <li>3. Less direct fiscal risk to city</li> <li>4. Increased Innovation</li> <li>5. Potential for increased citizen participation</li> </ol>	<ol style="list-style-type: none"> <li>1. Potential issues of Public Provision vs. Market Provision</li> <li>2. Ethical issues when combining public and private funds</li> <li>3. Potential hidden agendas of Private/Non-Profit organizations</li> <li>4. Oversight can be difficult</li> </ol>

## Green Building Initiatives

Most of the cities in the Siemens evaluation have implemented a program to improve the building standards for new construction and large remodeling projects for buildings in their respective municipalities. One of the most common standards referenced by the various green building initiatives across the cities analyzed is the Leadership in Energy and Environmental Design (LEED) rating. LEED ratings can be given at four different levels. Many of the cities in the study require new construction to meet a minimum of the Silver certification, with better incentives for buildings or projects that meet the LEED Gold standards.

There are several steps necessary to developing a successful green buildings program. To create a green buildings initiative, cities should examine the current state and local regulations to identify and gaps between the current regulatory documents and identified requirements and create the legislation to fill the gaps. Next, a city should identify the standards which meet



the needs of the community, and identify corresponding incentives to help guide the private organizations to meet them, and the proper enforcement mechanism to force compliance when necessary. Table 5 illustrates the role of the government and private or non-profit groups, types of funding sources, and examples of public engagement for key green initiatives.

**Table 5: Key Elements of Green Public and Private Partnerships**

	Government Role	Private/Non-Profit Role	Funding Source(s)	Public Engagement
<b>Green Buildings</b>	<ul style="list-style-type: none"> <li>- Regulation</li> <li>- Policy-making</li> <li>- Adherence to rules</li> </ul>	<ul style="list-style-type: none"> <li>- Advise Government policy-makers</li> <li>- Comply with regulations</li> </ul>	<ul style="list-style-type: none"> <li>- Tax/fee incentives</li> <li>- Penalties for non-compliant new construction</li> <li>- Regulation requiring builders to carry costs</li> </ul>	<ul style="list-style-type: none"> <li>- Publication of policy and desired effect/intent</li> <li>- Publish expected and actual savings on website</li> </ul>
<b>Solid Waste Recycling</b>	<ul style="list-style-type: none"> <li>- Regulation</li> <li>- Contract negotiation</li> <li>- Monitoring</li> <li>- Contract coordination with adjacent communities</li> </ul>	<ul style="list-style-type: none"> <li>- Perform task</li> <li>- Collect fees</li> <li>- Advise city</li> </ul>	<ul style="list-style-type: none"> <li>- User fees</li> <li>- Business charges</li> <li>- Mutual use/ cost sharing with adjacent communities</li> <li>- Regulation moving cost to users and other partners</li> </ul>	<ul style="list-style-type: none"> <li>- Education through social media, written materials</li> <li>- Campaign to show the positive results of program</li> </ul>
<b>Water Conservation</b>	<ul style="list-style-type: none"> <li>- Regulation</li> <li>- Provision of usage tracking/ usage notification capability</li> </ul>	<ul style="list-style-type: none"> <li>- If privately provided water, comply with regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Enterprise funds</li> <li>- Cost savings from paperless billing</li> <li>- Regulation</li> </ul>	<ul style="list-style-type: none"> <li>- Mailings/ emails to current customers</li> <li>- Savings report at the end of year included in bill.</li> </ul>
<b>Energy Conservation</b>	<ul style="list-style-type: none"> <li>- Partner with providers</li> <li>- Encourage green habits with education</li> </ul>	<ul style="list-style-type: none"> <li>- Provide green thermostats</li> <li>- Administer plan</li> <li>- Collect user fees</li> <li>- Savings from energy use</li> </ul>	<ul style="list-style-type: none"> <li>- Regulation</li> <li>- Credits to users and businesses</li> <li>- User fees</li> </ul>	<ul style="list-style-type: none"> <li>- Report on saving to customers at end of year</li> </ul>



Next, a city may consider offering incentives for building environmentally friendly structures within its city limits. There are several potential incentives a city could offer. First, it could use a reduced licensing fee as an incentive for meeting the identified standard for green construction (LEED Silver, as an example). If the fees charged for the project (either annually, or as a one-time fee reduction) are lowered sufficiently to encourage construction of building structures that meet green buildings standards for the city, perhaps such incentives may result in new business coming to the city. An additional incentive to be considered is that property and/or business taxes could also be lowered for businesses either building new structures that meet green standard compliance, or remodeling non-compliant buildings to meet the standard.

Another possible incentive, which would have a lower economic impact than the reduction of fees, is the addition of reduced processing time for licenses and building plan approvals for buildings and projects that exceed the standard set by the municipality. Expediting the processing time may have little economic impact on the city government, but could have great economic impact on businesses and their partners by reducing the delays in construction and use of the new premises. Through these mechanisms, the costs of creating better green building programs can be divided between the city in which the business reside, and the businesses themselves. As long as the standards and incentive programs are clearly stated, and the gates to be met for consideration for the incentives are transparent, there should be few equity or ethics issues that arise from the process.

### **Sustainable Solid Waste Policies and Programs**

The second budgetary recommendation is to reduce the solid waste produced by the municipality and increase the recycling and re-use of relevant solid wastes in an affordable, economic way. All of the cities reviewed conduct robust recycling programs and set goals to achieve reductions in landfill usage. To reach these goals, many cities have negotiated with private waste disposal companies that provide a variety of recycling options. To reduce landfill waste, both Seattle and San Francisco set goals, and established recycling requirements for any private organization that they allow to do business in the city.

To drastically reduce solid waste, it is recommended that cities exploring sustainability programs incorporate both a solid recyclables (plastics, metals, etc.) program and an organic recyclables (lawn wastes, compostable) program. As a sustainable resource, the recycling and compost materials can help subsidize the program by being sold to industries and agricultural users. In the Midwest, the compostable material could be particularly useful, as compost material for agricultural purposes. While this has been explored more extensively in Europe, the EPA has stated some guidelines for the use of compost in the United States (EPA, 2011).

As the use of compost materials increased in the agricultural industry in the United States, a compost recycling program may be able to be partially subsidized by the sale of compost materials to various agricultural concerns. In this way, the cost of the sustainability initiative could be shared between user fees, sale of recyclable materials, and the city's use of



landfills can be reduced, improving the sustainability of the process, and decreasing landfill fees.

### **Water Conservation and Sustainability Initiatives**

The third recommendation is to explore the creation of a water conservation program, as the top-ranked cities in the Siemens index did. Water conservation is an important topic in almost all areas of the country, with increasing populations and corresponding increases in agricultural demands. Though reducing the per-person usage of water has been a stated goal of many cities, this may cause some problems within the water departments in some areas, as their income is based on fees for use. Instead of focusing efforts on reducing the intentional use of water, it is recommended cities focus on identifying water lost through leaks, or the unintentional use of water.

For example, in order to bill customers and collect revenue, water departments already track the use for each business and household. Additionally, many departments have the option for online billing to reduce mailing and stationary costs. If these two capabilities are combined, the capability to inform customers of a 10% or higher variance in their monthly water use could lead to the earlier identification, and repair, of water leaks. This capability would require some computer application program coding to connect the two systems together with historical data. While this would create an up-front cost for the programming and application development, the potential savings from early leak detection could off-set this cost. For example, between 2006 and 2010, the City of Denver's leak detection program saved the city over \$395,665 from 271 identified leaks (Denver Water CAFR, 2010). The cost savings over time would pay for the initial application development investment in the program.

### **Energy Conservation Programs**

Finally, it is recommended that cities explore increasing energy conservation. The final by partnering with the local energy providers to provide low-to-no cost "smart" thermostats that can be remotely cycled by the power provider during peak hours to reduce the peak energy requirements. These smart thermostats are programmable to run the heating/air conditioning at different times and temperatures based on the needs of the user. The ability to program the heating and air conditioning systems in a home to use less energy during the day when the consumer may not be at the residence will save energy for the utility provider and money for the consumer. Additionally, if the energy company can cycle the heating and air conditioning units remotely on a time and peak usage basis, the infrastructure and energy output required can be reduced, providing savings to the users and to the energy provider.

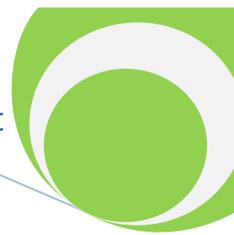
In this role, the city can offer education to the consumers about the various green programs, make use of the smart thermostats in government facilities, and work with energy providers who do not offer the service to provide it. The initiative would be largely funded through user fees and savings from saved energy use during peak times. The local government



may also need to provide some regulation to ensure that special needs and vulnerable population customers have special consideration for heating and cooling needs.

### **Conclusion**

As exemplified by the cities studied in this report, successful sustainability programs can be achieved. However, doing so requires commitment to financially fund and organizationally support them. Successful sustainability programs are not likely to occur through reliance on the private sector alone. Involvement by each of the cities was a key component to initiating and keeping many of their sustainability programs successful. Community support is also vital to a successful sustainability program. Government being a representative of public interest requires community support for its commitment of public resources to fund and organizationally support them. Some examples and recommendations for other communities wishing to embark on their own effective sustainability programs are provided in this report. Program costs were perhaps one of the more impactful areas noticed within each of the cities. Although each city had exemplary sustainability programs, not all of them were found to be in a financial condition that promoted their long term viability. As a result this report found that financing mechanisms, public support, and strong planning are essential for any city looking to develop, implement, and sustain sustainability programs.



**Appendix A: Denver, Colorado**

**Introduction**

Denver, Colorado, at the east side of the Rocky Mountains, has a population of 600,158 as of 2010. The population has decreased from 610,345 last year, after a steady climb from 2001 to 2009. The per capita personal income was 51,630 as of 2009 with an unemployment rate of 8.60%. In 2010 the unemployment rate increased to 8.90%.

To determine if Denver is financial healthy enough to sustain green initiatives rated in the Siemen’s Green Index (2011), a financial analysis of the city was conducted performed. The total assets for Denver are \$3,992,577,000 with total liabilities amounting to \$2,385,091. To determine if they can be obtained quickly, a Liquidity Analysis is performed. One measure of

liquidity is determined to be the Current Ratio (is 2.1. An acceptable value is greater than or equal to 2.0; therefore this ratio shows that the City of Denver is financially healthy. The ratio is not so high as to indicate poor management of resources. The Quick Ratio (is also 2.1 is also acceptable with a value of greater than 1.0 which also shows that Denver has very good liquidity and is able to meet its financial obligations.

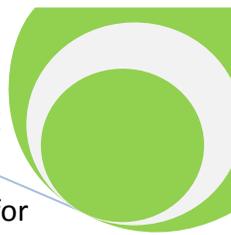
Denver	
Total Assets	\$9,399,170,000
Total Assets – Governmental Activities	\$3,992,597,000
Total Liabilities	\$6,680,713,000
Total Liabilities – Governmental Activities	\$2,385,091,000
Current Ratio	2.1
Quick Ratio	2.1
Long Term Debt Ratio	0.46
Net Assets Per Capita	\$2,706.4
Unrestricted Net Assets Per Capita	\$380.90
Aggregate Return on all net assets of all enterprise funds	(\$0.03)
Own Source	0.83

To determine long term solvency, the Long Term Debt Ratio is calculated as 0.46. The number should be as much lower than 1.0 as possible. This indicates that Denver is a public organization that is in good standing to pay off its long term debt.

To compare Net assets of the city with its population, the Net Assets per Capita is calculated as \$2,706.40. This high number indicates better solvency. To determine how

much “flexibility” the organization may have in meeting its obligations an Unrestricted Net Assets per Capita is calculated. Denver’s is \$380.90, which also indicates good solvency for Denver.

An additional indicator to determine the financial stability of Denver is the own source revenue ratio. This determines the amount of revenue dependent on grants and contributions (i.e. does the city rely heavily on State and Federal funding to supply revenue?). The own source revenue ratio of governmental activities is 0.83. This means that 83% of revenue for the city of Denver is generated without the aid of outside help. Denver does not rely too heavily on



other sources of income. This number, though, could be better as 90% is the ideal standard for self sufficiency. This is also called a risk analysis; the higher the number, the less the risk.

### Sustainability Programs

#### Energy

In 1980, long before it was popular to focus on conservation and green initiatives, Denver, Colorado, began the long journey of energy conservation. The effort was to conserve energy for the benefit of the environment, but more importantly at the time, to lower energy consumption by the government to give, according to Bulkeley and Betsill, “financial savings for local taxpayers” (Bulkeley & Betsill, 2003). Executive Order 12 was enacted to decrease energy use in city facilities. Fast forward to the year 2012 where the concern for conservation is considered more urgent than ever.

There are many policies concerning energy conservation. Two pieces of legislation were signed into law by former Colorado Governor Bill Ritter. Bill 07-1281 and House Bill 10-1001 increased the standard of the states renewable energy to 30% by 2020. This triples the previous standard. As stated by metrodenver.org: “These two laws, along with nearly 50 other clean energy bills have helped create new jobs, attract new companies, and spur innovation.”

There are many programs to help the citizens, businesses, and public agencies to conserve energy while increasing the use of renewable energy. Programs such as home upgrades to improve energy efficiency, along with and insulation program are available to Denver residents. The Energy Efficiency and Conservation Block Grant (EECBG) fund this project. There is an “energy advisor program” that also encourages implementation of cost-effective energy projects in both private home and businesses (the Better Buildings Grant). The energy advisor will discuss the energy usage needs for residents, businesses energy also will help them prioritize the measures needed for saving not only energy, but also money.

The Denver Energy Challenge program also encourages businesses through recognition, education, and rebates. The goal of the Denver Energy Challenge is to “save money, increase energy efficiency, and reduce greenhouse gas emissions,” as stated on the website for all to access.<sup>1</sup> Denver also has a public-public partnership with the state’s Governor’s Energy Office (GEO) for a congressionally directed project to provide rebates for citizens that increase the insulation in their homes. Funding for most of these projects are through the U.S. Department of Energy and some funding is through the City and County of Denver.<sup>2</sup> There are also rebates from Xcel, the private electric and natural gas company that works with Denver to supply the city and county with its energy needs. The rebates are from not only the Federal and local

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1

<http://www.denvergov.org/es/DenverEnergyChallengeforResidents/tabid/442598/Default.aspx>

<sup>2</sup> The 2011 GreenPrint Budget Summary and Budget Highlights are posted in the appendix.



governments, but also from the energy provider, itself, is what helps make these programs sustainable.

Many City departments are proactive in their effort to increase the energy efficiency of their areas. For example, the Regional Transportation District in its 2008-2009 Sustainability report, explained how they reached their goals of increased energy efficiency:

Taken from the 2009 Sustainability Report of the RTD<sup>3</sup>:

There is also a statement in the Mayor's 2012 budget that there was "a decrease of \$95,000 in services and supplies for electricity costs due to the implementation of PC management program that will automatically turn off employee PCs in the evening hours" (p. 397). There also was a decrease in utility costs of \$601,700 (in services and supplies) primarily due to "implementing best practices in building operations to identify cost-effective operational improvements" (City and County of Denver, Mayor's 20112 Budget, 2011). Many other goals and their achievement are listed on the GreenPrint Denver Web site including, a goal of solar installations at City facilities with the achievement of new projects that neared this goal. Another goal was to replace traffic signals with more efficient LED bulbs which would reduce energy use by 85%. This is underway with 2,000 bulbs being replaced in 200 signals. (Greenprint Denver, City and County of Denver)

Politically, it seems the initiatives are moved forward through the Mayor's office (past and present). Mayor Michael B. Hancock recently issued a challenge to the citizens of Denver to take up the Presidents energy challenge. Through television interviews and media coverage, energy initiatives are kept in the minds of Denver's residents. Throughout the energy program many parts come together to work for a better environment through energy conservation: The community values and priorities, the policy mandates, the leaderships (mayor's) values, and the anticipated environmental changes.

### Water

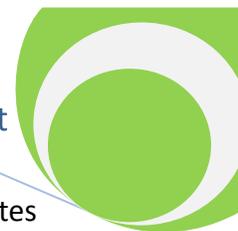
Denver Water is the public agency that supplies the city of Denver and its county with "high quality water"<sup>4</sup>. Denver water is "a legally separate and distinct legal entity from the City and County of Denver" In other words, the "City and County is not financially accountable for Denver Water. It does, however, through GASB statements 14 and 39, grace a position on the Denver CAFR in the "Component Units" category.<sup>5</sup> The organization had total assets of

<sup>3</sup> [http://www.rtd-denver.com/PDF\\_Files/2009\\_Sustainability\\_Report.pdf](http://www.rtd-denver.com/PDF_Files/2009_Sustainability_Report.pdf)

<sup>4</sup> 2010 Denver Water Budget statement

For a complete map of the supplied area: [http://www.denverwater.org/docs/assets/3F32FA08-CF24-1D76-BEABACA2D2AC9627/csa\\_metro\\_area\\_20091.pdf](http://www.denverwater.org/docs/assets/3F32FA08-CF24-1D76-BEABACA2D2AC9627/csa_metro_area_20091.pdf)

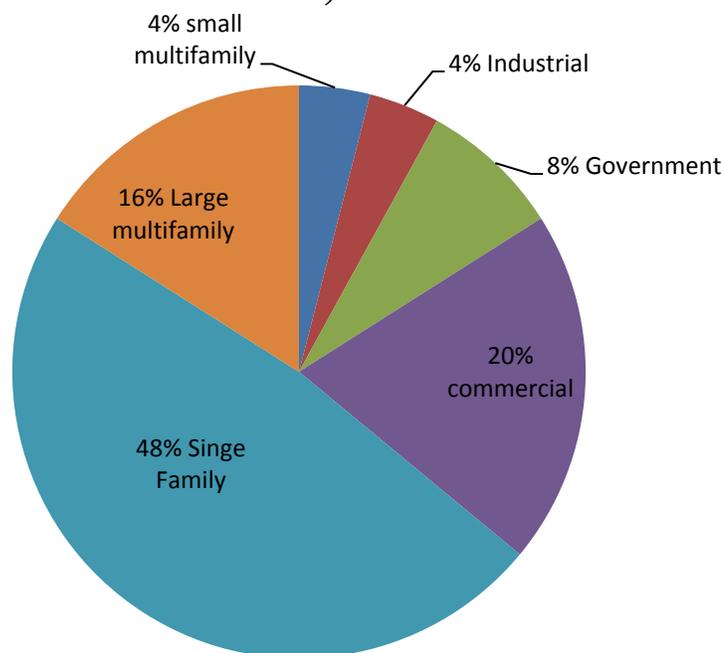
<sup>5</sup> Statement of the cover of the 2010 Denver Water CAFR: "The City and County of Denver has determined under Governmental Accounting Standards Board Statements No. 14 and 39 that its relationship with Denver Water is such that Denver Water's financial statements should be included as a "Component Unit" in the City's Comprehensive Annual Financial Report. Under the Denver City Charter, Denver Water is a legally separate and



2,106,592,000 and total liabilities of 523,783,000 in 2010. The budget is “funded by water rates and new tap fees;” therefore no taxes are involved in the sustainability of Denver Water. The total raw storage capacity of Water in 2010 was 183,090.1 millions of gallons<sup>6</sup> with replacement reservoirs at Williams fork and Wolford Mountain that have the capacity of 39,894.6 millions of gallons.

Denver Water, along with the City of Denver, realizes that water is a precious commodity and a public good that needs to be available to all citizens. Water needs to be protected and conserved so that the city and suburbs may continue to enjoy the life giving, refreshing attributes of one of our limited resources. One item to focus on in this endeavor is Denver’s water distribution system and efforts in conserving usage of the water distributed. Although Denver’s water rated 7<sup>th</sup> with 85.6 points, it is considered by Siemens to be “one of the most efficient water distributions systems in the index” (Siemens, 2011). According to Denver Water, water is delivered to various customers with families<sup>7</sup> consuming the most at 68%, followed by Commercial activity 20%, Government, 8% and Industry 4%.

### Percentage of Treated Water Use in Denver, CO

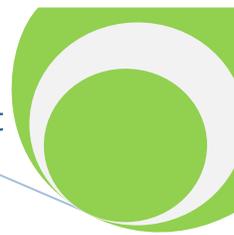


Denver Water Usage by Customer Type

distinct legal entity from the City and County of Denver and the City and County is not financially accountable for Denver Water.” See appendix for sustainable financial calculations.

<sup>6</sup> Stored at Dillon, Eleven Mile Canyon, Cheesman, Gross, Antero, Chatfield, and Soda Lakes. The operating reservoirs are Marston Lake, Ralston, Strontia Springs, Long Lakes, and Platte Canyon.

<sup>7</sup> Family units consisting of single family, small multifamily (2-5 units), and large multifamily (6+units) (Denver Water, 2012)



Conservation of water begins at home; so the first home to look at is the Denver Water organization. To be delivered to citizens’ homes and businesses efficiently, the equipment needs to be maintained and kept up to date. To this endeavor the Denver Water has a strong leak protection program and estimates that they have saved from over \$50,000 in 2006 to over \$89,000 in 2010<sup>8</sup>.

**DENVER WATER LEAK DETECTION PROGRAM**

	2010	2009	2008	2007	2006
Non-Visible Leaks Detected	100	145	107	17	28
Non-Visible Water Leaks Loss (1000's of Gallons) <sup>1</sup>	28280	38106	28119	4467	7358
Visible Leaks Pinpointed	43	89	60	26	53
Miles Surveyed	801	606	226	183	781
Savings Generated from saving lost water <sup>1</sup>	\$ 59,670	\$ 72,800	\$ 51,739	\$ 82,119	\$ 13,538
Savings Generated from pinpointing Leaks <sup>1</sup>	30,001	62,300	42,000	18,200	37,100
Total Savings Generated from Leak Detection Program <sup>1</sup>	\$ 89,770	\$ 135,100	\$ 93,739	\$ 26,419	\$ 50,638

<sup>1</sup>Estimated.

Source: 2010 Denver Water CAFR, pg III-89

After assuring that Denver Water is doing what it can to conserve water, the focus may then move forward to the citizens and businesses of Denver.

In 2010, Denver Water focused on the citizens by changing its water enforcement program and hiring a temporary crew of employees designated as a “roving crew of Water Savers.” The program educated over 4,300 customers about summer water rules and how to lessen water waste. The crew traveled to sites by either bicycle or fuel-efficient cars.

There are programs through the Green Print Denver website that offers “education, free support services, and financial assistance” to citizens and businesses of Denver and its county (Greenprint Denver, City and County of Denver, 2012). There is also a “Watts to Water” program that awards businesses that reduce consumption of water (and energy). This program was developed to build a more sustainable environment in Denver through the participation of businesses. Although Denver is rated with the highest rating for water efficiency, it was brought to attention that consumption was very high at 181 gallons per capita per day with the average being 155 gallons. Denver Water is trying to counteract this with “Tips & Tools” for both businesses and homes on how to conserve and use less water (also to fix leaks home owners may have). For example, the “tip of the month” for April is to replace spray nozzles with rotary nozzles to cut water usage by 30%. This site can also be accessed through the Green Print Denver web site. There are both home and business rebates that can be obtained from Denver Water when inefficient fixtures, devices, and appliances are replaced with more efficient models (Denver Water).

Not only are the citizens and businesses encouraged to decrease their water use, but also the government, itself has goals to attain in water (and energy) conservation. Goal 1 in the

<sup>8</sup> 2010 Denver Water CAFR. See appendix for estimated savings per year.



2009 Colorado Regional Transportation Department (RTD) Sustainability report stated “Reduce amount of materials consumed<sup>9</sup>. To accomplish this goal, the RTD retrofitted the restrooms at the Blake Street offices with toilets and urinals designed for low water usage. This was expected to lower water usage by 67%.

What encourages water conservation in Denver is the state of Colorado’s active process to create Bills that mandates the entire state to be proactive in its endeavor towards improved water conservation. In 2010 there were two Bills that related directly to water conservation. House Bill 10-1051 defines a standard for water conservation throughout the state<sup>10</sup> and awareness of availability of water-smart options in new homes is the focus of House Bill 10-1358.

To keep conservation in the public eye, public servants must be vigilant as “cheerleaders” to keep the motivation alive. Recently Denver Green Streets TV held an interview with Denver Mayor, Michael B. Hancock about his vision for sustainability in Denver. He issued a water challenge to the city to become wiser in their water usage (which improves upon the decrease of 23% already achieved). There is also currently a “Use Only What You Need” ad campaign.



The city of Denver’s longtime partnership with Denver Water assures that there will be continued funds for the ongoing campaign to lessen water usage.

One item to focus on is Denver’s water distribution system and efforts in conserving usage of the water distributed. Although its water rated 7<sup>th</sup> with 85.6 points, it is considered by Siemens “one of the most efficient water distributions systems in the index” (Siemens, 2011). Water is delivered to various customers with families<sup>11</sup> consuming 68%, Commercial activity 20%, Government, 8% and Industry 4%. Conservation of water begins at home; the first home to look at is the Denver Water department. To be delivered to homes and businesses efficiently, the equipment needs to be maintained and kept up to date. To this endeavor the Denver Water Department has a strong leak protection program and estimates that it has saved from over \$50,000 in 2006 to over 89,000 in 2010<sup>12</sup>.

There are programs through the GreenPrint Denver that offer “education, free support services, and financial assistance” to businesses of Denver and its county (Greenprint Denver,

<sup>9</sup> 4.1.4 Manage Resources in the Colorado Utilities 2010 report from the Governor’s Energy Office

<sup>10</sup> This includes installing water-efficient toilets, showerheads, and faucet aerators and reporting to the state measures take to improve water conservation. (Colorado Municipal League)

<sup>11</sup> Family units consisting of single family, small multifamily (2-5 units), and large multifamily(6+units) (Denver Water, 2012)

<sup>12</sup> 2010 Denver Water CAFR. See appendix for estimated savings per year.



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### **Environmental Governance:**

Although ranked fifth overall, the City of Denver ranked first in Siemens’ list amongst cities in the United States and Canada for environmental governance. The concept of environmental governance can be defined as “Multi-level interactions (i.e., local, national, international/global) among, but not limited to, three main actors, i.e., state, market, and civil society, which interact with one another, whether in formal and informal ways; in formulating and implementing policies in response to environment-related demands and inputs from the society; bound by rules, procedures, processes, and widely-accepted behavior; possessing characteristics of “good governance”; for the purpose of attaining environmentally-sustainable development” (EcoGov, 2012).

In the case of Denver’s pursuits of environmental governance, the city connects with the business, government, and resident communities to develop policies, actions, and guidelines that will result in improved sustainability efforts in Denver and what the city calls the “triple-bottom line analysis,” which balances short- and long-term economic, social, and environmental considerations” (GreenPrint, 2012) in all of the cities operations and programs.

At the core of the city’s sustainability efforts is its GreenPrint Denver plan, which was introduced in 2005 as a way to centralize and prioritize the city’s green initiatives across all city government platforms. Below is its mission:

“The mission of GreenPrint Denver is to provide leadership and solutions to ensure a prosperous community where people and nature thrive.

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<sup>13</sup> This includes installing water-efficient toilets, showerheads, and faucet aerators and reporting to the state measures take to improve water conservation. (Colorado Municipal League)



### Guiding Principles

- Communicate sustainability as a public value and expand the concept of the city as a steward of public resources.
- Support sustainability as a core business value to improve efficiencies in resource use, reduce environmental impact, and invoke broad cultural changes.
- Incorporate “triple bottom line” analysis, seeking to balance economic, social and environmental considerations into all city policy and program decisions.
- Set clear metrics of success and report on our progress moving forward through annual report cards.
- Pursue activities that support environmental equity and health for all citizens.
- Partner with community organizations, cultural institutions and businesses to achieve broad impact.
- Lead by example in city practice wherever possible.”

(GreenPrint, 2010)

GreenPrint Denver is emphasized throughout the city’s budget and clearly stated as one of the strategic initiatives for the city. “An over-arching focus for the Mayor’s Office continues to be on sustainability, in every regard, including a sustainable community where economic health and environmental strength are inter-dependent; a sustainable region in which our successes are shared and do not come at the expense of neighbors; and a sustainable vision that leaves a legacy of opportunity, financial stability and social equity for future generations through the GreenPrint Denver programs (106).”

Throughout the city’s 2010 budget document, GreenPrint Denver is mentioned in various strategic plans for different city departments. The city’s formal sustainability initiatives were developed in 2007 straight from the top, as an executive order by then-city mayor John Hickenlooper. In 2010, Hickenlooper formally established the GreenPrint Denver Office, which by design, is to integrate the city’s sustainability goals and initiatives into city agencies and departments. Additionally, the Office is to provide oversight for coordinating sustainability initiatives, develop and share reports as to the progress of sustainability initiatives, and foster and support citizen participation in sustainability initiatives. By establishing this office, the mayor created one, centrally-focused area to monitor environmental progress in the city with a broad lens. Further, since specific staff was devoted to this, it signals that the city values sustainability so much that it is willing to match the effort with the appropriate resources. Further, when Hickenlooper’s term came to an end, the GreenPrint office continued under the new mayoral administration of Michael B. Hancock.

Although a specific office was created, the office could not have staff in each city department. As such, a Green Initiatives Committee was created that involves personnel from various departments across the city to make recommendations for improvement to the



GreenPrint Denver Office towards its “triple-bottom line” goal, which is to “reduce the economic, environmental, and social impacts of unnecessary energy use” (GreenPrint, 2010).

Implementation and allocation of resources for GreenPrint action items are evident in the city’s budget document. For the applicable city areas, funds are allocated and justified for new or existing green initiatives according to the GreenPrint Denver plan. This shows alignment between the agencies and how they fund their sustainability programs, to the overall GreenPrint Denver plan, to the mayor’s office.

Additionally, the city has worked to gain further support for the program by communicating strategically with the community in terms of clear, easy to use websites and marketing, social media, and constantly updated information feeds that push information to residents. Moreover, the city has developed neighborhood and community-based Green Teams to gain ideas and promote interaction with the public. This helps gain public perspective as to how residents see the city’s sustainability needs and improvement items evolving, while also serving as a catalyst for the GreenPrint staff to be in neighborhoods recommending sustainability improvements on the micro level, such as moving to more energy efficient light bulbs or other environmentally friendly options (Siemens, 2011)

It is helpful to the mayor’s office and GreenPrint Denver staff that the public generally holds these efforts in high regard.

The City of Denver has supported innovative sustainable development strategies for many years, and GreenPrint Denver is built on a strong foundation of past accomplishments. These

### 2011 Greenprint Budget Highlights

- 🌱 **Energy Efficiency and Conservation Block Grant (EECBG)**
  - 🌱 Internal energy projects expected to save at least \$400,000 per year.
  - 🌱 Expansion of B-Cycle bike sharing program, Mile High Million tree planting, continuation of residential energy efficiency upgrade and insulation program, among others
- 🌱 **Better Buildings Grant**
  - 🌱 Joint partnership with Boulder County, Garfield County, the Metro Mayors Caucus, and the Denver Regional Council of Governments
  - 🌱 Funds will be used to implement an energy advisor program to further promote implementation of cost-effective residential and commercial energy projects.
- 🌱 **Neighborhood Weatherization Congressionally Directed Project (CDP)**
  - 🌱 Denver is partnering with the Governor’s Energy Office to use funding from a Congressionally Directed Project to provide increased insulation rebates to Denver residents.
- 🌱 **Solar America Cities Grant**
  - 🌱 Funds programs to promote solar energy development in Denver, including projects for City facilities expected to save over \$400,000 over 20 years.
- 🌱 **Special Revenue Fund**
  - 🌱 Funds Greenprint programmatic expenses from small grants and private donations.
- 🌱 **Mayor’s Office General Fund**
  - 🌱 Covers minor administrative expenses such as printing.

accomplishments signal to city employees, the mayor’s office, local politicians, and residents that the city’s sustainability efforts are not only beneficial for the environment, but are gaining local, regional, and national attention through various award recognitions.

The GreenPrint Denver office is a strong example for the case of environmental governance because it

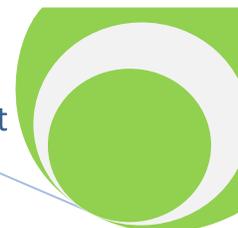


seeks to integrate the civilians, government, and non-profit organizations into the city's sustainability efforts, allows for reporting and progress monitoring, partners with city officials and the public, and dedicates resources solely towards sustainability.

Since 2007, the GreenPrint Denver office and its initiatives have been funded by a variety of sources; however, there is no clear allocation of funds for the effort in the mayor's budget. This is confirmed by Cindy Bosco of the GreenPrint office. "Our office isn't even a line item in the Mayor's budget. We have received grant funds over the years for specific projects, but aside from ARRA funding, we rely on City agencies to implement the GreenPrint Denver goals and objectives" (Bosco, 2012).

What is clear, however, is that the city relies on a mix of city funding, state funding, federal funding, private grants and contributions to fund sustainability initiatives in the city. As Bosco mentions, funds from the American Recovery and Reinvestment Act (ARRA) provides some funding for the office and the city's efforts. Funds for sustainability efforts within the city agencies can be seen in the city's budget document, the budget of which is funded for by user fees, service charges, and taxes.

However, some programs are paid for by a combination of funding sources. For example, city, state, and federal funding, as well as private grants, pay for programs such as free home weatherization for income-qualified residents.



### Appendix B: New York City, New York

The City of New York is rated as one of the top three cities in the United States by [www.cityrating.com](http://www.cityrating.com). The population of New York City as listed in the Comprehensive Annual Financial Report (CAFR) is 8,391,881 (CAFR 2011 New York, p.332). The population is spread across five boroughs: Brooklyn 31%, Queens 27%, Manhattan 19%, Bronx 17%, and Staten Island 6%. The ten year trend has been a 4.7% increase in population. The median age of New Yorkers is 35.9. New York is experiencing the highest rate of unemployment over the last 10 years at 9.5% (2010). It is up from 6.1% in 2001. The Per capita income is \$48,619. This is a decrease of \$2,261 from 2008. For the most part there has been a steady increase over the last ten years and is presently \$10,000 higher than the national per capita average.

In 2009, New York launched a comprehensive plan to transform the city with green initiatives. Thirty initiatives were set in motion which is projected to create 13,000 new jobs by 2018. Highlights include creating an urban technology innovation center, providing resources on green incentives available to businesses, and piloting deployment of urban wind projects.

Review of the CAFR for the City of New York and financial documents of the Statement of Net Assets and the Balance Sheet of Government Activities enables analysis of short term and long term financial stability, liquidity, and solvency. New York is unique in that business activities are independent of the city government and referred to as component units; the city government is not responsible for the fiscal solvency or failure of the component units although the city appoints the majority of the board members and can influence their financial decisions significantly. Therefore, the assets and liabilities of the City of New York are listed separate from the business activities and fiscal ratios calculated for analysis are calculated separately.

New York	
Total Assets of Component Units	\$15,455,844,000
Total Assets – Governmental Activities	\$78,272,683,000
Total Liabilities of Component Units	\$15,515,590,000
Total Liabilities – Governmental Activities	\$196,277,747,000
Current Ratio	1.16
Quick Ratio	1.13
Long Term Debt Ratio	2.16
Net Assets Per Capita	(\$14,061.81)
Unrestricted Net Assets Per Capita	\$1.46
Aggregate Return on all net assets of all enterprise funds	(\$.01)
Own Source	0.61

The total assets of government activity are \$ 78,272,683,000 and the total liabilities are \$196,277,747,000. The current ratio is a measure of liquidity in which the current total assets are divided by the current total liabilities (\$31,738,748,000/\$27,475,346,000.) An acceptable value is greater than or equal to 2.0. The current ratio for New York 2011 is 1.16 and shows that the City of New York has inadequate



cash solvency toward paying off current debt indicating inadequate management of resources. The cash ratio and quick ratio measure cash solvency indicating a city's ability to financially pay off current liabilities. The cash ratio is .42%; the higher the ratio the better. An acceptable value for a quick ratio is greater than 1.0. The quick ratio for New York is 1.13, which shows that the city has liquidity to meet its financial obligations; however, the overall picture is congruent with the low cash ratio indicator.

The long-term debt ratio, a city's non-current liabilities measured against a city's total assets, is a measure of long term solvency. It is "an organizations ability to pay off long-term debt" (Wang, 2010, p. 139). A lower ratio is a good indicator of long run solvency. A ratio near 1.0 is an indicator of financial struggle to pay off long term debts in the future. New York has an alarmingly high long-term debt ratio of 2.16, which indicates the city has no ability to pay off its long-term debt.

Service solvency can be assessed by net assets per capita, which indicates the level of net assets in relation to population. A higher ratio indicates a better level of service solvency. New York City's net assets per capita are (\$14,061.81) indicating services such as education, library, social services, housing, transportation, parks and recreation, pensions, or environmental protection may be at risk for a decrease.

The unrestricted net asset per capita is a performance measure of flexibility in handling financial obligations and a higher ratio indicates better flexibility. The un-restricted net assets per capita ratio is (1.46). This deficit in the unrestricted assets per capita indicates the city has no flexible funds to rely upon in the event of an emergency or in the event of an unforeseen priority expense. All assets are over allocated for specific purpose.

The own source revenue calculates the ratio of the government revenue generated from its own sources as opposed to outside sources. Sources of government revenue are taxes, charges, fees and other revenues. Own source revenues are considered more stable and controllable. A higher ratio indicates a higher level of solvency. The own source ratio for the City of New York is .69 % so outside revenue sources account for 31%.

The constitution of The City of New York sets forth a legal debt margin. It is noted that the debt margin has decreased from 81.25% to 68.38% over the last ten years. The debt ceiling is set at 10% of the five year average valuation of taxable real estate. As real estate valuation has increased so has the debt ceiling. The amount of debt is 28% higher than it was ten years ago and two authorities have been legislatively created to absorb debt up to \$13.5 billion debt. This allows the City of New York to enter further contractual commitments and continue a general obligation financed capital program.

In 2011, the City of New York had \$259 million in uncollected parking violation fines (Liu, 2011, p. 319). This is outstanding revenue that could benefit their poor solvency situation.



Independent component units of business are fiscally analyzed separate from city government for this city. The total component unit revenue is \$15,455,844,000 and total liabilities are \$15,515,590,000. Collective analysis of the components indicates good budgetary solvency with a current ratio of 3.22%. The cash ratio is 1.31% and the quick ratio is 3.12% indicating liquidity to meet financial obligations. The long-term debt ratio is .8% which is approaching the value of concern for the ability to pay long term debt. The net assets per capita is \$502, signifying solvency although the unrestricted net assets ratio is (.08) demonstrating that the component units are operating at a loss.

The Statement of Activities for Component Units and the Statement of Net Assets for Component Units are included in the CAFR. The profitability of the component units of business are operating at (1.4) aggregate return on net assets; losing \$.014 per dollar of net assets. The operating loss is (254) and with the loss being minimal, the operating margin is 1.0, indicating expense and revenue is for the most part even.

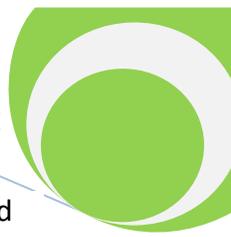
New York's water and sewer system is one of its component units. The operating revenue is \$1,080,284,000 and the operating expenses are \$1,782,825,000. This unit operates at a loss of (\$702,541,000). The operating margin is -65%. In most circumstances, this is not of concern as government is in the business of providing services that are not adequately provided in the private sector; government is not a business and therefore can operate at a loss.

The City of New York decided to make a change in the use of resources within New York City and its surrounding areas. Because of a growing population, aging infrastructure, changing climate, and an evolving economy, New York City was faced with many challenges and hurdles. The close examination of those challenges resulted in the creation of PlaNYC 2030, a bold agenda to meet those challenges to build a greener, greater New York.

PlaNYC, implemented in 2007, complements other programs, but focuses on the physical city, and the functionality of the infrastructure in a New Yorker's everyday life. Those focus areas Housing and Neighborhoods, Parks and Public Space, Water Supply, Transportation, Energy, Air Quality, Solid Waste, Public Health, and many more.

Bold proposals require bold ideas to acquire sufficient funding to implement. In New York City's case, several avenues have been explored and implemented. On April 22, 2007, Mayor Michael Bloomberg unveiled his plan for New York City which covered all phases of development through 2030. Included in his plan was the strategy for funding the 127 separate initiatives in the plan. Part of this plan included having the City contribute large portions of funding directly to the program as well as developing a new agency for transportation and other infrastructure projects.

According to Glen Pasanen in the May 2007 *Gotham Gazette*, "The fiscal impact of Mayor Bloomberg's PlaNYC 2030 could be huge in the long run, but judging from the mayor's \$59 billion executive budget for 2008, the short-term impact will be quite modest." Released only a few days after Bloomberg's Earth day speech, it included only \$200 million for programs



called for in his plan for a sustainable city, and the \$84 billion, 10-year capital budget plan had only \$1.6 billion specifically targeted for PlaNYC.

The long-term fiscal impact of the plan is unclear because its big-ticket investments, especially in the key transportation area, depend largely on the future political actions of officials from outside the city. To fund its grand vision, PlaNYC would require a new state-authorized public financing authority, shared city/state authority on regional transportation issues, a multi-billion dollar revenue stream from congestion pricing, and a promise from the state to match billions of future city investment dollars. And the term-limited mayor had little more than two and a half years to get this done.

Because the funding of PlaNYC is tied to future state legislative and state budget decisions, the basic questions are political, not fiscal. The mayor wants the city to be an equal partner with the state on regional as well as city transportation matters. Today, the mayor lacks power over the agencies that could implement his large vision. He is often at the mercy of the governor, who controls many state authorities and agencies, and the state legislature.

The mayor's plan also makes an implicit case for creating and maintaining a Bloomberg legacy. In its proposal for the SMART authority, the administration asks that any legislation establishing the authority not only split its governance evenly between city and state, but it "should state that board members must not be government employees; that membership terms should be staggered; and that experience in finance, planning or transportation be a prerequisite for membership." This would give the mayor appointment powers to help place supportive individuals who would remain on the authority's board beyond the end of his term in 2009.

Glen Pasanen, in 2007, says a fiscal plan that depends on as many political variables as PlaNYC 2030 does will require enormous good will and cooperation among state and City officials in order to push forward. Surely, the city has shown its solid, long-term experience and commitment to major capital projects. As a recent study by the Independent Budget Office of an earlier 10-year capital plan (the 2000-2009 plan) shows, the city has generally met or exceeded its ambitious capital goals (Pasanen, 2007).

For instance, between 2000 and 2006, the City committed nearly \$42 billion in capital investments, \$4.6 billion more (12 percent) than originally planned in 2000. Economic development projects totaled \$1.3 billion, 85 percent more than planned, largely because of Bloomberg additions (Pasanen, 2007). A case could therefore be made that the City has the track record and capacity to contribute more to the long-term funding for PlaNYC. Of course, that was before the recession in recent times affected all levels of government.

GreenNYC collaborated with the New York City Department of Parks and Recreation (DPR) to publicize Mulchfest, an annual City event where New Yorkers recycle their Christmas trees at parks across the five boroughs and get free mulch. The Department of Sanitation



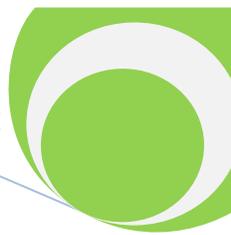
(DSNY) reported that the individual participation in 2010 Mulchfest increased by 38 percent from the previous year.

As the mayor makes his way through the thicket of state politics in search of the authority and non-city money to implement and continue the different parts of PlaNYC, he and the city council must consider how to best use the city's resources to better insure its development.

According to Thiel (2010, p.6), there are ten factors that contribute to PlaNYC's success. The first factor is the participation and membership in ICLEI – Local Governments for Sustainability. ICLEI-Local Governments for Sustainability is the leading nonprofit membership organization devoted to local governments engaged in sustainability, in areas such as climate protection, clean energy initiatives, biodiversity programs or clean water initiatives. ICLEI provides technical consulting, training, and information services to build capacity, share knowledge, and support local government in the implementation of sustainable development at the local level. The basic premise is that locally designed and driven initiatives can provide an effective and cost-efficient way to achieve local, national, and global sustainability objectives. ICLEI-Local Governments for Sustainability spent over a year researching and understanding the process New York City followed to develop PlaNYC and interviewed many of the key people involved in the development of the plan. Through this research process, in April, 2010, ICLEI identified the top ten factors for success of PlaNYC:

1. Strong mayoral leadership and cooperation between the Mayor's Office and City Council.
2. A group of dedicated city agency staff performed in-depth research and analysis, involving extensive coordination and collaboration between the agencies.
3. A methodical, transparent, and inclusive planning process.
4. Central management and coordination provided by the Mayor's Office of Long-Term Planning and Sustainability.
5. An external Sustainability Advisory Board provided best practice advice and guidance.
6. A comprehensive public outreach process generated broad public support and helped to educate the general public about climate change and sustainability issues.
7. The Mayor's Office of Long-Term Planning and Sustainability strategically released the plan by coordinating announcements with key stakeholders.
8. The plan included an implementation plan with a timeline and a funded budget.
9. Swift transition from planning to action: the City is actively implementing all 127 initiatives.
10. Openness for innovation and policy-making not driven by politics or business as usual.

In addition, Thiel (2010) made note that there were a number of private sector strategies that were adopted by the City of New York during the Bloomberg administration (p. 9). Those seven strategies were:



1. A City, like a business, needs a long-term strategic plan, and PlaNYC represents the Mayor's cornerstone strategic plan for the City.
2. The Mayor cultivated a culture in City government that empowers staff to innovate by hiring top talent and encouraging them to develop creative new solutions to the toughest problems.
3. As an independent leader, the Mayor has made decisions based on what is best for the City and not necessarily what makes him popular with the voters, which was essential when contemplating some of the controversial issues such as congestion pricing.
4. As a businessman, the Mayor instilled the discipline of performing cost-benefit analysis on all investments in terms of capital projects or new programs. He does not however require city staff to just look at the financial benefits of an investment. He also asks them to consider the intangibles such as quality of life improvements.
5. The Mayor recognized that good ideas alone cannot accomplish major changes. Staff must communicate and package ideas skillfully and make sure the public is on board with major proposals.
6. The Mayor also believes City government needs to be held accountable for its actions, going so far as to make public a report on how he is doing compared to his campaign promises; he adopted the same approach to progress reporting with PlaNYC.

Although PlaNYC encompasses several focus areas, three programs or initiatives will be featured in this report, including Solid Waste, Air Quality, and Water Supply.

### **Sustainability Programs**

#### **Solid Waste**

According to the City of New York's PlaNYC's 2011 progress report, in 2012, New York City is expected to generate more than 14 million tons of waste and recyclables in homes, businesses, non-profit institutions, streets, schools, and construction sites. The City spends approximately \$1 billion annually on Department of Sanitation collection and disposal service for one quarter of this waste, the nearly four million tons collected from households, streets, government, and non-profit institutions. This enormous undertaking requires a fleet of more than 2,000 City and 4,000 private collection trucks, most of which rely on a network of private transfer stations located throughout the City and region. The waste is then transferred to another fleet of long haul trucks, barges, or railcars for final disposal.

This complex system has an enormous impact on the environment, communities, and economy. It is estimated the city's entire solid waste system creates 1.66 million metric tons of greenhouse gas (GHG) emissions annually, representing three percent of the city's total GHG emissions (PlaNYC, 2011). A significant portion of these emissions are attributable to methane from landfills that receive the waste, even with methane capture systems in place.

New York City created the Solid Waste Management Plan (SWMP) in 2006 as a joint effort with the administration, City Council, environmental organizations, and community



groups. This strategic path charts a path toward a more equitable and sustainable waste management system which results in less traffic congestion, noise, and related air pollution by maximizing the use of rail and barges to transport waste outside the city.

Although the City's SWMP is showing positive results, managing the waste in an equitable, sustainable, and cost-effective manner is increasingly challenging. Despite improvement in the operation of the program, the City is still spending more than \$300 million per year exporting most of its waste to landfills as far away as Ohio, Virginia, and South Carolina (PlaNYC, 2011). This transfer is an expensive and carbon-intensive approach to ridding the City of its waste. The City recognized waste reduction and recycling is a part of the solution to these issues. As such, the City believes that converting the waste to energy is a viable part of the solution. The City has therefore begun pursuing alternatives to landfills and typical waste to energy disposal. Several ideas have been proposed. Some of these proposals include diversification, sustainable resource reuse and recovery, reliability, and risk.

### **Air Quality**

In PlaNYC, the City recognized the need to work with the Port Authority of New York and New Jersey (PANYNJ) to develop a clean air strategy for its port facilities. Over the past year the City, the PANYNJ, the EPA, the States of New York and New Jersey, and the industry participated in an unprecedented partnership to produce an actionable and transparent plan for reducing maritime emissions. In October 2009, the PANYNJ released its Clean Air Strategy, demonstrating that emission reductions are feasible and measurable. According to the City of New York's PlaNYC's 2011 progress report, in March 2010, the EPA and the PANYNJ unveiled a comprehensive agreement that will cut harmful pollution from the East Coast's busiest port by launching a \$28 million truck replacement program, partially funded by \$7 million from the American Recovery and Reinvestment Act to re-place old trucks with vehicles that meet stricter pollution standards. The agreement, signed by a wide array of federal, state, and local partners, details the specific steps the partners will employ to reduce harmful diesel pollution from the Port of New York and New Jersey. The City also has obtained funding to install plugins for refrigerated containers at New York City's marine terminals and other locations and is studying the feasibility to a hybrid-powered tug and ferry program.

Over the next year, the City will continue urging Congress to enact the green taxis law, installing pollution controls on school buses, and finish upgrades to the engines of the Staten Island Ferry fleet. The most important area of focus over the coming year will be in heating oil. Since early 2009, the City has been in discussions with stake-holders about approaches to reduce the emissions from heating oil – particularly the disproportionately high emissions from the 9,896 buildings that burn the highly polluting residual oil (PlaNYC, 2011).

In the years since Mayor Bloomberg released PlaNYC, the City continues to launch and implement its initiatives toward nurturing a greener, greater New York City. They have made exceptional progress with the combined efforts of more than 20 City agencies, the Mayor's Sustainability Advisory Board, the City Council and other elected officials, partners and



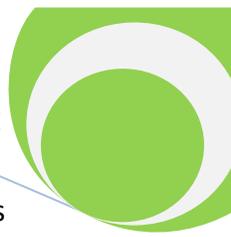
supporters from all across New York City, and from around the world. From the passage of the Greener, Greater Buildings Plan and the school bus retrofit law, to the opening of the 100th schoolyard-to-playground, to the planting of the 300,000th tree, the City has sustained momentum and made progress.

This coming year will see additional milestones. The Department of City Planning, Economic Development Corporation, and other agencies will continue moving forward with transit-oriented re-zonings and preparing a new Comprehensive Water Front Plan that will establish a vision for a 21st century water front. To help ensure the long-term viability of New York City's affordable housing supply and contribute to a cleaner, healthier environment, the Department of Housing, Preservation and Development will require that all new construction projects financed by the agency achieve Green Communities Certification. The Department of Parks and Recreation will continue developing its regional parks, transforming schoolyards into playgrounds, and expanding its aggressive tree-planting program. The Office of Environmental Remediation will launch its local brown field cleanup program. The Department of Environmental Protection will issue on-site storm water requirements promised in the Sustainable Storm Water Management Plan and continue to acquire land to protect the watershed, guard against unacceptable risks from natural gas drilling, and continue construction of the Croton Filtration Plant, the UV disinfection plant, and Water Tunnel No. 3.

The Office of Long-Term Planning and Sustainability will work with the Climate Change Adaptation Task Force to complete its report and to identify climate change impacts that are beyond the ability of individual entities to address. The Department of Transportation and the Metropolitan Transportation Authority (MTA) will launch bus rapid transit service in Manhattan. The City will continue to pursue legislative and regulatory action where it is needed to achieve its goals, through urging Congress to enact the green taxis law and pursuing heating oil regulations to phase out the use of dirty heating oil. New York City also will continue to advocate for a set of stable, protected, long-term revenue sources for the MTA to ensure that critical transit infrastructure gets built and maintained.

Any long-term vision must be refreshed over time, and the City supported the passage of Local Law 17 of 2008, which requires an update to PlaNYC every four years. As a long-term plan, much of PlaNYC is still not complete. But, once every four years, it is equally appropriate to ask: What has worked well? What can go farther? What did not work as well? What more needs to be addressed?

During 2010, the City asked the public to identify emerging ideas and help update the City's long-term sustainability plan while continuing to implement and report on the status of its initiatives. Engaging New Yorkers was central to the development of PlaNYC. In 2006 and 2007, the City convened roundtables, town hall meetings, and working groups throughout the city, and solicited email and web-based suggestions. Through a similar process each year, PlaNYC can be kept as innovative as the city it serves, while retaining the central goals and the ongoing initiatives that should be continued.



Approximately five years ago, when PlaNYC was in the development state, New York's population was 8.2 million (PlaNYC, 2011). Today, that has grown to 8.4 million. Few New Yorkers would have considered their city to be an environmental model. Today, people around the world recognize that New York City is America's most carbon-efficient society. A few short years ago, it would have been unrealistic to think that New York would be a leader in green building policy and air quality efforts, or that it could have the largest fleet of hybrid taxis in America. Today, all are true. Unfortunately, budget surpluses of the past have made government investments easy. Today, budget constraints require the City to do more with less.

### **Water: Water Network**

New York has the luxury of an abundant water supply, but the supply system faces challenges due to development and age. Critical elements of the system, such as aqueducts and water tunnels, cannot be taken out of service to be repaired and development encroaching on the city's watersheds impacts the quality of drinking water. PlaNYC sets a strategy to protect the quality of water at its source and to create redundancy for the infrastructure that carries the water from the watershed to the tap. Finally, PlaNYC calls for the repair and modernization of in-city distribution. According to the PlaNYC 2011 progress report, since the release of the original plan, New York has received a Filtration Avoidance Determination, acquired an additional 28,600 acres in the upstate watershed to bring the total to 108,000 acres, installed over 278,000 Automated Meter Reading units and launched a system for real-time online water use tracking for homeowners and businesses, and met significant milestones on construction of City Water Tunnel No. 3.

PlaNYC contains the following water network initiatives:

- Ensure the quality of drinking water
- Continue the Watershed Protection Program
- Construct an ultraviolet disinfection plant for the Catskill
- Build the Croton Filtration Plant
- Create redundancy for aqueducts to New York City
- Launch a major new water conservation effort
- Maximize existing facilities
- Evaluate new water sources
- Modernize in-city distribution
- Complete Water Tunnel No. 3
- Complete a backup tunnel to Staten Island
- Accelerate upgrades to water main infrastructure

### **Water: Water Quality**

With over 600 miles of coastline, waterfront revitalization has been a guiding principle for New York City over the last five years. Research indicates most people believe it is time to accelerate the reclamation of the waterways themselves, particularly in the most polluted tributaries, the small rivers, creeks and canals that transverse neighborhoods. The ICLEI 2010



report states, since PlaNYC was released, the City has invested \$2.1 billion to further improve wastewater treatment. These investments continue to pay off. In January 2010, the City reached a major milestone of having all 14 wastewater treatment plants meet the monthly Clean Water Act standard of pollutant removal harbor-wide. As a result, New York Harbor is cleaner than it has been in over 100 years. To further reduce pollution, the City will continue to upgrade water infrastructure, increase the use of sustainable storm water best management practices (BMPs), including taking key steps to implement the Sustainable Storm water Management Plan, and protect wetlands. The City has improved the capture rate of combined sewer overflows (CSOs) from approximately 18 percent in the 1980s and 67 percent in 1994 to 73 percent today, and the potency of CSOs has decreased as well. The amount of sanitary waste in CSOs has declined from 30 percent in 1994 to 12 percent in 2008, which means that the composition of overflows is now primarily rainwater. By implementing water quality initiatives, the City can restore the city's natural ecology and the recreational use of the waterways. ICLEI, in their 2010 report goes on to say the City should continue with the following actions:

- Continue implementing infrastructure upgrades
- Develop and implement Long-Term Control Plans
- Expand wet weather capacity at treatment plants
- Pursue proven solutions to prevent storm water from entering the system
- Increase use of High Level Storm Sewers (HLSS)
- Capture the benefits of the City's open space plan
- Expand the Bluebelt program
- Expand, track, and analyze new Best Management Practices (BMPs) on a broad scale
- Form an interagency BMP Task Force
- Pilot promising BMPs
- Require greening of parking lots
- Provide incentives for green roofs
- Protect wetlands

### **Cost**

PlaNYC contains the original budgeted amount for both capital and operating funding for all 127 initiatives of all areas of sustainability. The capital budget for Fiscal Years 2008-2017 for PlaNYC was over \$2 Billion and the operating budget for Fiscal Year 2008 was \$249.8 Million. These figures were the originally budgeted amounts for PlaNYC, but since its release in April 2007, some of the funding may have changed, due to altered economic conditions. Despite these budgeted costs, many initiatives in PlaNYC were planned with very little or no cost to the City.

### **Lessons Learned**

A few of the actions or policies that were integral to the success of PlaNYC, as reported in the ICLEI 2011 report, are listed below:



- Located the office responsible for the coordination and implementation of PlaNYC at the executive level, giving it more authority.
- Formed the plan using quantifiable and measurable goals, targets and objectives
- Ensured the plan was realistic and achievable with current technologies
- Inspired agencies to commit to PlaNYC
- Used top-down leadership and support to push PlaNYC within the City
- Reached out to advocacy organizations, scientists and the public from the beginning of the process to ensure their support

### LEGISLATION

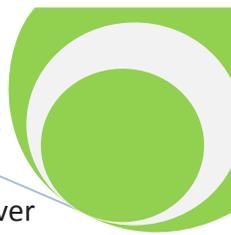
- Local Law 5 of 2008. Local Law 5 of 2008 amends the administrative code of the City of New York, codifying the PlaNYC water quality initiative to develop and implement a sustainable storm water management plan.
- Local Law 5 streamlines approvals for all areas of environmentally beneficial technologies, design and construction techniques, materials and products.

Wastewater infrastructure is also very costly. The City's capital budget for infrastructure improvements is at a record level, and the City has largely maintained this commitment through difficult economic conditions. Water rates have been increased by double digits in each of the last three years, in large part to fund these projects, but also due to increases in non-discretionary expenses such as energy and chemicals. The City's ability to further improve water quality must be balanced against the impact that increased water costs would have on the affordability and economic competitiveness of New York City. Water quality improvements also depend on collaboration with the Department of Environmental Conservation (DEC), which monitors and approves the City's wastewater treatment operations and water quality improvement projects. The City will need a strong partnership with DEC to ensure that it is able to implement the sustainable strategies that are most effective for New York City.

As New York City looks to the future, a renewed era of capital investment is under way to ensure that these systems can remain viable for generations to come. To protect drinking water quality and ensure reliable delivery, the City is spending \$6.73 billion over the next ten years. The current level of capital investments in the water system is virtually unprecedented since the Croton system went into service in 1842 (ICLEI, 2010).

These projects are ambitious and forward-thinking. Even in a time of economic down turn; it is important to invest in the water network, both to maintain the system and to avoid even greater rehabilitation costs in the future.

Since 1997, the City has invested \$1.5 billion in source water protection programs, and in the next ten years the City will invest \$1.9 billion more. These investments have allowed the City to keep its status as one of only five large cities in the country with an unfiltered water

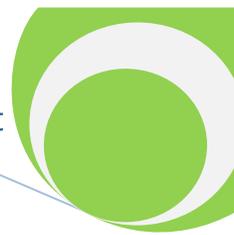


supply system, thus avoiding the need to build a filtration plant that would potentially cost over \$10 billion to construct and \$100 million per year to operate (ICLEI, 2010).

Since the launch of PlaNYC, the City has invested over \$175 million in watershed protection programs, including \$104 million to purchase land and easements in the watershed, nearly \$12 million to help watershed homeowners repair or replace failing septic systems, almost \$12 million to construct new wastewater infrastructure in communities with concentrated areas of substandard septic systems, and more than \$30 million to upgrade existing waste-water treatment plants to provide the highest levels of treatment. The City has acquired over 28,600 acres of watershed land and easement since PlaNYC was launched to bring the City's total holdings to 108,000 acres. The City has remained vigilant against potential threats such as natural gas drilling and taken action to oppose those activities that could irreparably harm the water supply (ICLEI, 2010).

In Staten Island, the City is partnering with the Army Corps of Engineers to construct a \$300 million water tunnel to provide critical redundancy for Staten Island's water supply. This project will be funded through a 50-50 cost sharing with the U.S. Army Corps of Engineers. The City is also moving forward with upgrades to water main infrastructure. The City has been replacing sewer mains, reaching 22 miles in 2009. The City anticipates meeting its goal of replacing 80 miles in 2010 due to the influx of \$144 million in federal stimulus funding for other projects (ICLEI, 2010).

Most of the City's current major capital investments are mandated by state and federal regulators. The City must build these projects on a set schedule, which means that in some cases the City ends up paying significant debt service on several large projects at once. The City has also raised water rates by over 10 percent for each of the past three years to pay for these mandates. Despite these increases, the cost of New York City's water is still below the national average. The way the City pays for water infrastructure has changed dramatically over time. In particular, over the last decade unfunded federal and state mandates have become the single largest driver of the City's capital budget and therefore the water rate. During the 1970s and 1980s, when the City was upgrading its wastewater treatment plants to meet rigorous new water quality standards, the same regulatory agencies mandating this multi-billion dollar work were also helping to pay for it. Since then, mandates have only become more stringent and projects more costly, but federal and state aid has all but disappeared. New York City is now left to finance its critical water and sewer projects almost entirely through water and sewer fees paid by 834,000 customers citywide. The City continues its efforts to work with regulators to find flexible, cost-effective solutions that do not compromise public health or environmental quality (ICLEI, 2010).



**Appendix C: San Francisco, California**

San Francisco has a population 795,238 which has been gradually declining since 2009. The average annual income is \$75,372.00, which is the highest in 20 years. The median age of a city resident is 38.5 years old and the city has an unemployment rate of 9.2%. This rate is high considering the unemployment rate at one time was as low as 4.1%. The top three employers in San Francisco, in order, are The City and County of San Francisco, The University of California, and Wells Fargo & Company.

The City and County have combined total assets \$20,507,491,000 with government activities of \$5,602,897,000. San Francisco’s total liabilities were \$14,268,120,000, and those of government activities only were \$4,292,588,000. When looking at the city’s CAFR, it is important to analyze these indicators to evaluate the financial stability of the short term as well as long term of any agency to get a grasp of the financial performance and operations of its budget such as liquidity, borrowing capacity, operating deficits, pension liability and capital outlays.

Liquidity evaluates whether an organization has enough cash and cash equivalents to meet short term obligations. One indicator of liquidity is the current ratio, which indicates a

San Francisco	
Total Assets	\$20,507,491,000
Total Assets – Governmental Activities	\$5,602,897,000
Total Liabilities	\$14,268,120,000
Total Liabilities – Governmental Activities	4,292,588,000
Current Ratio	1.95
Quick Ratio	1.938
Long Term Debt Ratio	.5748
Net Assets Per Capita	\$1,647.66
Unrestricted Net Assets Per Capita	(\$1,613.41)
Aggregate Return on all net assets of all enterprise funds	\$0.04
Own Source	0.71

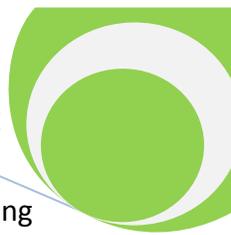
city’s financial state and how it manages its financial resources. From San Francisco’s Statement of Net Assets, the city’s current ratio is 1.952, which is acceptable and shows that San Francisco is financially healthy.

The ability to pay or cash solvency is very important when an agency is expected to financially support a desirable level of services. One of the ways to measure this is by using the quick ratio, which shows if a city is able to meet its financial obligations. In general, an acceptable value for this ratio is greater than 1. San Francisco’s value is 1.93, which shows that it has enough liquidity to meet its financial obligations.

The long term debt ratio is also an important indicator of solvency and the agency’s ability to pay is assessed by measuring its total long term debt against its total assets (or total revenues). If the value for this number is near 1,

the agency may struggle in the future to pay off the long term debts in the future. In the instance of San Francisco, the value is 0.57 which means the City has good long term solvency.

Service solvency can be assessed by net assets per capita, which indicates the level of net assets in relation to population. A higher ratio indicates a better level of service solvency.



In the case of San Francisco this is \$1,647.66 per capita. This seems to be a high ratio indicating that for every person, \$1,647.66 is how much City public service is worth, such as access to the libraries, recreation centers, parks etc.

When looking at financial performance, it is important to look at the flexibility an agency has for handling its obligations. Some things may occur without warning and may cost a substantial amount of money to overcome in an unplanned situation. Unrestricted net assets per capita takes into considerations the net assets that are available for immediate use (e.g., they are not “promised” for specific purposes). Again a high ratio would be good for any agency. In San Francisco unrestricted net assets are negative, or -\$1,613.41 per resident. This indicates that all funds are obligated to something already and the City leaves little room for an emergency situation if one should occur.

Financial stability is important to any community and looking at indicators of earning and profitability is one more way to grasp what sorts of business-type activities and services are occurring and how to monitor it. Earnings and profits are not an objective of many organizations, but some functions in most agencies do produce some sort of goods and services and evaluating them is important. One such way is to calculate the aggregate return on net assets of all enterprise funds or “return of net assets” which assesses the profitability per dollar of net assets. In this city’s case, for every dollar spent, there is a \$0.04 gain per dollar on net assets.

Another analysis for mapping financial strength or weakness is to calculate operating margins of businesses activities. The operating ratio assesses the sufficiency of revenues to cover expenditures. A higher value ratio indicates a better level of budgetary solvency. To do this, total revenues are measured against total expenditures. Total revenues/ total expenditures; In 2011 San Francisco had greater expenses than it did revenue. This is not necessarily a bad sign since most city services are not expected to make a profit. However, in some instances, such as business activities like the city’s power plant, the city earned \$0.15 for every dollar spent on operations.

Lastly, San Francisco’s calculating the own-source revenue ratio, which indicates the level of revenues that come from a government’s own sources such as taxes, charges, fees and other revenues is important because these sources are considered more stable and controllable. A higher ratio indicates a greater level of solvency. For San Francisco, its own source revenue ratio was 0.71 or 71 percent, meaning that it relies on 29 percent of its revenue from external sources, and is therefore at a lower risk of being insolvent should it lose external funding, such as federal, state, or private grants.

In conclusion San Francisco is a financially stable and healthy community. Their resources are managed well and show every sign of being responsible with funds and have the community’s best interests in mind. The only concern is the fact that if there is a financially catastrophic event San Francisco could struggle gaining financial ground if such an event occurs.



### Sustainability Programs

According to the US and Canada 2011 Siemens Green City Index, San Francisco ranked first out of 27 other major cities in nine different categories. The Green City index was a research project conducted by Economist Intelligence Unit, which compared 27 major cities “environmental performance”. San Francisco was ranked first overall as a result of the strong rankings in all of the categories across the board. San Francisco was one of the only cities to place in the top ten of all nine categories and four of which were ranked either first or second. San Francisco’s rankings are included below.

San Francisco’s top ranked green initiatives, particularly those related to waste, air and buildings, could be used as model programs for other cities. Detailed information on each of the aforementioned initiatives is included below.

### Waste Category

San Francisco’s strongest area for environmental sustainability is the disposal of waste. San Francisco is the first city in the United States to require both residents and businesses to separate recycling and compost from the normal trash. The city works in conjunction with a private company, Recology, for waste collection (Sullivan, 2011). Recology is an employee-owned company that provides services for land fill diversion and resource recovery through collection, recycling and composting (Sullivan, 2011). The city determines the primary services the company will provide. Currently, Recology provides three bins to residents and businesses. One is used for recyclable materials, one is for composting materials and the other is for normal trash. The city and Recology will come to an agreement on the charges for the services to cover expenses (Recology). As a result of this program, in 2008 San Francisco diverted more than 1.6 million tons of waste from the landfills (Siemens, 2011). In August 2010, San Francisco had surpassed their goal of 75% for its municipal waste recycling rate by achieving 77% (Siemens AG). Jack Macy, Department Environment Coordinator, credits landmark legislation as essential to their success. He stated, “It gave our goals teeth” (Sullivan, 2011).

In 1989, one of the crucial pieces of legislation California passed was AB 939. This law required Municipalities to divert 50% of their waste from the landfill by the year 2000 or pay a fine up to \$10,000 a day. As a result of this legislation the state of California went from diverting 10% to 58%, whereas the City of San Francisco went from 25% to 77% (Sullivan, 2011). In Sullivan’s article, he indicates 1996 as the pivotal year for San Francisco regarding the diversion of waste from the landfills. This was the year San Francisco began their pilot program by beginning the collection of commercial food waste, which was then followed by the collection of residential food waste in 1997. By 2004, this program was rolled out to everyone and was paid for by customer service fees. In 2009, the City of San Francisco passed an ordinance requiring everyone in the city to recycle and compost (Sullivan, 2011). Currently, this program recycles 220,000 tons of organics annually, producing compost utilized by area farms, vineyards and residents. In 2007, San Francisco was the first city to ban plastic bags. This has



forced stores to use compostable bags or reusable bags or bags that contain a minimum of 40 % recyclable materials (Siemens, 2011).

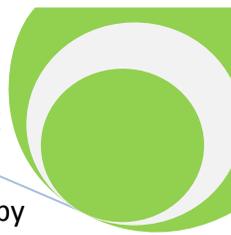
San Francisco's waste program is financed under the concept of "pay as you throw" trash meters (Sullivan, 2011). Each resident is charged \$27.55 a month for the weekly collection of the three 32 gallon carts. Jack Macy, Department Environment Coordinator, states, "The ultimate goal is zero waste or waste zero" (Sullivan, 2011). Residents may request a 64 or 96 gallon recycling or compost bin at no extra charge, but monthly fees will be doubled for the 64 gallon trash bin or tripled for the 96 gallon trash. This rate structure is used as an incentive for residents to recycle and compost more, which would result in less trash. Businesses are charged using the Uniform Commercial Rate Structure. This structure uses base and variable rates and a recycling incentive program. This incentive program is on a customer specific basis depending on their diversion rate. The maximum incentive allowed to obtain is a 75% discount (Recology). All of the fees paid for waste disposal are not only used to cover the expenses of the service, but also the 3% of these fees are set aside for the San Francisco's Solid Waste Fund Account. According to the Mayors' proposed 2012 budget, the majority of the Department of Environment is funded by this account (City and County of San Francisco).

The successes of this program can be attributed to multiple factors. One of the most important factors is the great partnerships between the city, residents and private companies, Recology. It is the cooperation of these entities that make this program possible. The legislation that has been passed and the ability to enforce the laws is an integral part as well (Sullivan, 2011). As mentioned previously, San Francisco is leading other cities in passing this type of legislation. But also just as important, they have put procedures in place to enforce these laws. The Public Works Department can issue fines for contamination of public health and are allowed to put liens on people's property for no-payment of services (Sullivan, 2011).

### **Air**

As mentioned previously, the City of San Francisco ranked second in clean air. Siemens Green City Index stated that its clean air polices are the "most robust" in the Index. This is as a result of the priority San Francisco places on clean air due to a study which was conducted. This study found air pollutants near industrial sites, major highways and other transportation corridor, which is vastly populated by lower income and racially diverse neighborhoods. These residents are more likely to suffer from the impact of air pollutants, which can cause serious health problems for children and elderly (sfenvironment.org).

In 1999, the city passed the Healthy Air and Smog Ordinance. This ordinance required the City Manager to purchase the most environmentally clean vehicles available for the city fleet (sfenvironment.org). San Francisco is the leader in the use of alternative fuels, with 800 in its own fleet. These vehicles are powered by natural gas, electricity, biodiesel and hybrids. They encouraged this alternative fuel industry by securing grants to buy cars for the city fleet, encouraged manufactures to produce clean air vehicles, built fueling and recharging stations accessible to the public and sponsored public exhibits (sfenvironment.org). By 2005, the city



had a directive in place stating that 70% of all non-emergency, light duty vehicles purchased by the city were to run on alternate forms of fuel (Siemens, 2011). In 2008, the city passed the Green Taxi Law which required cab companies to reduce their green house emissions levels to 20% below the levels in 1990 by the year 2012 (Siemens, 2011).

Along with the use of alternative fuels, the city promoted driving alternatives. San Francisco has been creating initiatives and programs to support alternatives to driving as far back as 1993. According to Union of Concerned Scientists, “the mode of transportation that you choose has the greatest impact on the environment than any other choice you make as a consumer” (sfenvironment.org). In order to encourage people to use public transportation, the city created the Commuter Benefits program. This program could save individuals up to 40% on transportation cost with per-tax savings. This program allows an individual to deduct \$125.00 per month for transit and carpool expenses. An ordinance passed in January of 2009 required business with 20 or more employees to offer the Commuter Benefits program to their employees. Another incentive used is the “parking cash out” program. This program provides payments to employees who give up their parking space (sfenvironment.org).

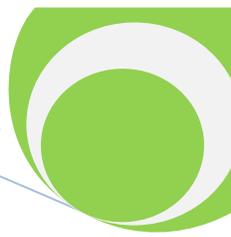
As a result of San Francisco’s initiatives, the city now emits four pounds of sulfur dioxide per person and the average for the cities listed in Siemens Green City Index was 22 pounds. About half of San Francisco’s public transit fleet is comprised of zero-emissions vehicles and more than 100 compressed natural gas taxis drive more than 1,000,000 miles per day (sfenvironment.org). Also, approximately 60% of the city vehicles run on alternative fuel. The city was able to achieve these successes through legislation and the financial incentives.

### Green Buildings

San Francisco ranked second in the building category in Siemens Green City Index (2011) primarily due to their energy efficient building standards. San Francisco was one of three cities to score full marks for energy efficient buildings (Siemens, 2011). Green buildings are built to create more energy than they use. They have fewer toxins and promote health and well being. Green buildings are built to purify their own water and clean their own air (sfenvironment.org). The Green building initiative was a collaborated effort through a partnership with non-profit organizations and businesses. A task force was put together with 10 members from “San Francisco’s ownership, developer, financial, architectural, engineering and construction community”, this was referred to as the “Mayor’s Task Force” (Mayor's Task Force, 2007). This group was tasked with making recommendations to for building standards to apply to private sector market (sfenvironment.org).

A variety of legislative initiatives were passed to move the city in the right direction. A list of the initiatives is included below (sfenvironment.org):

- **2004- Resource Efficiency Requirements and Green Building Standards Ordinance.**
  - This ordinance required all city building projects, both new and major renovations over 5,000 square feet, to adhere to the LEED Silver certification



standard. This also prohibited the city from purchasing and using wood from tropical rainforest and virgin redwood project. Arsenic treated wood was also prohibited by the city. This refers to wood that was treated with arsenic-based wood preservatives.

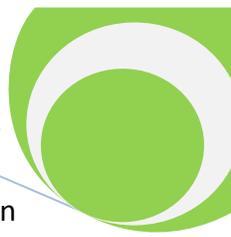
- **2005- The Residential Green Building Resolution.**
  - This resolution endorsed California's green home building guidelines.
- **2006-Green Building Priority Permitting**
  - The city provided an expedited permit review process in the Planning Department, Building Inspectors and Public Works Department for all LEED Gold certified projects.
- **2008- The Green Building Ordinance**
  - This ordinance required all homes built to meet certain standards.

The city also requires commercial business occupying more than 10,000 square feet to conduct energy efficiency audits every five years. As a result of these audits, the city feels it will be able to reduce the use of energy to approximately half of what it would have been without the energy audits in 20 years (Siemens, 2011).

The city understands that the green building initiatives require certain standards which are added costs to the design and construction to the building. The increased costs are anywhere from 2% to 5% based on the level of certification. However, the city believes in time the trend will start to decrease as the market for these standards of buildings grow. The city is not intending to create a hardship for anyone with these policies but sees it as an increased asset for the value of the building (Mayor's Task Force, 2007). According to the Green Building Costs and Financial Benefits report, "...the total financial benefits of green buildings are over ten times the average initial investments required to design and construct a green building". There are also low cost loans available to property owners to help fund green improvements (Siemens, 2011).

The city recognizes they will need to make investments as well. They are putting not only extra money into their municipal buildings but also increased funding is needed for staff training and additional allocations for process changes. The Task Force recommended an increase in city permit fees to help pay the administrative costs for both the staffing and rebates provided for green projects (Mayor's Task Force, 2007).

As a result of this initiative, San Francisco is leading the way in requiring all new Municipal building to achieve LEED certification. As of September 2011, San Francisco has 43 municipal projects totaling 4.5 million square feet seeking LEED certification. The Municipal LEED projects include three museums, two hospitals, 10 libraries, five recreation centers, an airport terminal and a cruise ship terminal (Strategic Plan 2010-2012, 2011).



All of these green initiatives would not have been as successful without the foundation of San Francisco's Sustainability Plan. By putting this plan in place first, it gave the green initiatives the community and political support it needed to succeed.

### **Sustainability Plan**

The City of San Francisco began working on a Sustainability Plan in 1993. This plan would be a very good model for any other city to use that is striving to reach the level attained by San Francisco. One of the most integral parts of this plan was the collaboration of community and city agencies. This plan was designed, structure and implemented by several factions of the community from concerned residents, business leaders, environmental organizations, elected officials, etc.

The plan began with defining sustainability and why it is important. The plan states, "A sustainable society meets the needs of the present without sacrificing the ability of future generations to meet their own needs". The plan also educates the public on how human activity interacts with the natural resources of the planet and the concerns this may cause for the environment. The plan then discusses steps for possible solutions. The plan states the following.

"To construct a sustainable society, one that can provide for the physical and other needs of local residents while reversing the trends of increased pollution and environmental degradation now threatening the quality of urban life and the health of the earth's other life forms, it is necessary to start changing the conventions of society".

This plan was intended to be used as a tool to begin changing the practices in the community by setting goals and objectives to be achieved.

In 1993, a Commission on San Francisco's Environment was established by the San Francisco Board of Supervisors. The Commission was tasked with drafting and implementing a plan for long-term sustainability. The Commission worked on numerous hours with the assistance of over 400 volunteers to help produce the plan. The plan was structured after the European Community's Agenda 21 Implementation Plan.

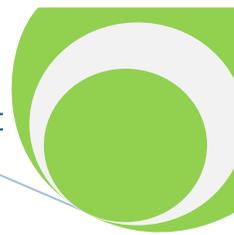
In June of 1996, the city held a four-day long hearing for the public to comment on the draft of the plan. They continued to take public comments for the next year while the Board of Supervisors considered the plan. The Sustainability Plan became policy of the City and County of San Francisco in July 1997. In order to help implement the plan, the Board of Supervisors created the Department of Environment. Beryl Magilavy, Department of Environment Director, wrote, "This plan is a first step in the long process of changing attitudes that separate humans from the rest of the natural world and ignore the long-term results of human behavior. It is a process of developing the wealth of the community, and strengthening the health and capacities of all the City's residents. Through vision, persistence, and a plan of action, San

## Recommendations for Sustaining Sustainability Initiatives in City Government



Franciscans will be able to create a healthy society that respects the needs of all its members, and the needs of the natural systems of which they are a part”.

Based on all the time and effort San Francisco has put into the sustainability of the city, particularly green initiatives, it is not surprising that the city ranked first overall.



**Appendix D: Seattle, Washington**

Seattle has a population of 612,000 which has been increasing continuously from 1910. The average income is \$56,904. The median age is 37.2 years old and the average unemployment rate is 8.3%, which is just below the national unemployment rate of 8.7%. This has improved from February 2011 – February 2012 from 9.6. The top three employers in Seattle ranked in order from number one to number three is Boeing, Microsoft, and the University of Washington.

The city has combined total assets of \$9,508,089,000 with government activities only of \$4,398,281,000. Seattle’s total liabilities are \$5,310,459,000 with government activities only at \$1,614,066. A couple ways to measure cash solvency is by formulating the current ratio and the quick ratio. The current ratio is 2.831, which indicates that the City of Seattle is financially healthy and indicates good management of resources.

Another ratio of cash solvency is the quick ratio, which is a more conservative indicator of cash solvency. Seattle has a quick ratio of 2.75 which indicates that Seattle has resources to meet its financial obligations.

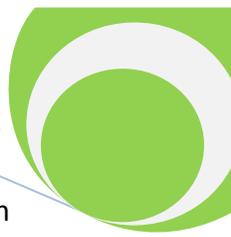
The long-term debt ratio assesses Seattle’s ability to pay off long-term debt. Seattle’s long-term debt ratio is .3107. This number represents the solvency of Seattle as well, and is positive for Seattle because it is a lower number.

The Net Assets Per Capita measures the service solvency, which indicates the level of net assets relating to the population. Higher net assets per capita indicate a better level of service solvency. Seattle’s Net Assets Per Capita is \$4,549.37. This is another positive indicator for Seattle, indicating that for every citizen, \$4,549.37 is what their public services are worth.

Unrestricted net assets represent the assets that are not restricted for something certain, and are available for use. The unrestricted net assets per capita for Seattle are \$153.04. This number measures Seattle’s ability to respond to an unplanned situation, or some type of emergency.

Seattle	
Total Assets	\$9,505,089,000
Total Assets – Governmental Activities	\$4,398,281,000
Total Liabilities	\$5,310,459,000
Total Liabilities – Governmental Activities	\$1,614,066,000
Current Ratio	2.83
Quick Ratio	3.7
Long Term Debt Ratio	.3107
Net Assets Per Capita	\$4,549.37
Unrestricted Net Assets Per Capita	\$153.04
Aggregate Return on all net assets of all enterprise funds	\$.08
Own Source	0.92

The aggregate return on net assets for Seattle’s enterprise funds is another indicator of financial stability. The aggregate return on net assets number represents the indicators of



earning and profitability of the enterprise funds for the city. This has a \$.02 gain per dollar on net assets.

The operating profit margin ratio of business activities is another indicator for financial strength or weakness. For the water facility of Seattle, the ratio is .27, which concludes that the expenses are not more than the revenue. When formulating the operating ratio for the water enterprise fund, a .22 profit for every dollar spent of operation was found. Both of these numbers suggest that Seattle's enterprise funds are well managed and operating at a beneficial level for the city financial performance.

Finally, the last indicator reviewed was the own-source revenue ratio, which is another measure of budgetary solvency. This ratio indicates the revenues that come from Seattle's own sources, such as taxes or user fees. The own-source revenues are considered to be more stable and controllable and a higher own-source ratio indicates a higher solvency level. Seattle's own-source ratio is .92 which indicates that they only get 8% of their revenue from outside sources. This is another good indicator of Seattle's strong financial qualities.

In conclusion, Seattle is a financially stable and healthy community. Their revenues exceed their expenses, their enterprise funds operate at a stable level bringing in more revenue than spending on operating costs. The city has a positive unrestricted cash base which would provide for any unplanned occurrence or emergency, as well as only receiving about 8% of their revenues from outside sources.

### **Sustainability Programs**

According to the 2011 Siemen's research project conducted by the Economist Intelligence Unit, *US and Canada Green City Index*, the City of Seattle is the fourth greenest city out of the 27 major cities studied. The overall ranking was based upon the accumulated rankings in nine different categories: buildings, waste, environmental governance, land use, transport, water, air, CO<sub>2</sub>, and energy (Siemens, 2011).

Seattle performed strongly across all categories in the report, maintaining above average scores in all nine categories. Of the nine measures, Seattle ranked first in the buildings metric, second in waste, and fourth in environmental governance. Seattle's longstanding commitment to green buildings, starting in the late 1970s, helps explain why it leads the nation in this category and could serve as a model for underperforming municipalities (Hess, 2005).

Political support for green initiatives has been constant, with direction from the Mayor's Office and the creation of the Office of Sustainability and Environment in 2000. (Athens, 2010) Seattle mayors have undertaken a series of initiatives to promote sustainability, ranging from the Seattle Climate Protection Incentive and Seattle Green Building Capital Initiative launched by Mayor Greg Nickels to the aggressive \$40 million green jobs initiative, currently being pursued by Mayor Mike McGinn (Grygiel, 2010).



The Office of Sustainability and Environment coordinates Seattle's sustainability efforts, providing detailed information about the City's initiatives as well as tools for the public or other city administrators seeking information fostering a more sustainable community.

### Green Buildings

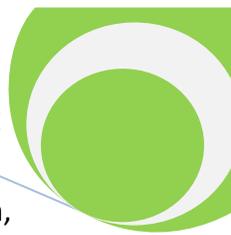
Seattle's mission to create sustainability and conservation-related initiatives, which later developed into its *Green Buildings Program*, started over 30 years ago when Seattle City Light (SCL), the City's public utility company, launched an energy conservation program in response to increased demands and concerns about nuclear power generation (Hess, 2005). The Seattle City Council served as pioneers in green building policy, adopting the nation's first green building policy in February of 2000 that required new city-funded projects and renovations with occupied space of more than 5,000 square feet to obtain the Leadership in Energy and Environmental Design (LEED) Silver rating (Sustainable Building Program 5-Year Report, City of Seattle, 2005).

Seattle possesses the strongest green building initiative rating also because it was an early adopter of LEED certification for municipal building projects (Siemens, 2011). Seattle scored maximum points in the *Green City* projects building category's "two main policy areas for energy efficient buildings: standards and incentives" (Siemens, 2011). Seattle's commitment to LEED certification can be seen in its ratio of seventeen LEED certified buildings per 100,000 people, nearly three times the Index average of 6.4.

Seattle's early adoption of sustainable building programs came as a response to strong grassroots community support. (Brown, et al, 2011) Adoption of the LEED standard was made via a unanimous City Council resolution, reflecting the public's strong support for sustainable building policies. (Athens, 2010) A strong private sector demand for green construction also helped increase the supply of contractors and suppliers who can provide the labor and products necessary to be LEED compliant. (Sustainable Building Cluster Study, Final Report, City of Seattle, 2005)

At the forefront of Seattle's current efforts to promote sustainable living is the *Green Building Program*, an effort to meet current building needs while reducing impacts on future generations. This program focuses on integrating building materials and methods that promote environmental quality, economic vitality, and social benefit through the design, construction and operation of the built environment. (City Green Building Progress Report 2008-2009, City of Seattle, 2010) Seattle has created a Green Team that oversees the program and collaborates with other city departments to be able to execute their concentrated initiatives: The Office of Sustainability and Environment (OSE), which oversees green codes and permitting, and the Department of Planning and Development (DPD), which is part of the Operations Division, are both part of the Green Team. (Green Building: Our Program, City of Seattle, 2011)

To reach its green build goals and gather political support, Seattle provides developers, contractors, and homeowners three separate services to facilitate building projects: incentives,



technical assistance, and education. The DPD developed and oversees the incentive program, “Priority Green,” providing financial benefits and permitting priority to program participants. Construction grants, tax deductions, cost-sharing incentives, and rebates are all available to prospective builders, remodelers, or technology adopters (Seattle Green Building Incentives: Commercial Projects, City of Seattle, 2011). Similarly, participants in “Priority Green” are allotted quicker building permit review times for projects that meet green building standards as well as priority review for innovative projects with potential code challenges (Priority Green Overview, City of Seattle, 2011).

To qualify for these incentive programs, participants must meet Seattle’s standards for sustainable building. Seattle defines sustainable building as “an integrated framework of design, construction, operations, and demolition practices that encompasses the environmental, economic, and social impacts of the built environment. Green building practices recognize the interdependence of the natural and built environments, and balance social and human needs with conservation, integrating the “three P’s” of sustainability— People, Planet, and Prosperity” (Sustainable Building Program 5-Year Report, City of Seattle, 2005).

The rationale behind green building programs is not solely environmental, but also fiscal. While environmental concerns played a major role during the nascent stages of the movement, as the City’s policies and understanding of green building have expanded, so has the understanding of the potential financial savings green building can provide. As noted in one of the key priorities of the City’s Sustainable Building Program is to trigger market transformation of the construction industry and increase awareness of the long-term value green build can provide participants. As the City noted in the 2005 5-Year Report: “An up-front investment of less than 2% of construction costs yields life cycle savings of over 10 times the initial investment,” (P. 12, citing “The Costs and Financial Benefits of Green Buildings” A Report to California’s Sustainable Building Task Force, October 2003) making green build projects far more cost-effective, especially when combined with utility incentive programs that cover initial installation costs. Marketing the potential savings of green build projects is another method of developing political support from citizens and interest groups concerned with government waste and efficiency.

In addition to efficiency concerns, Seattle has begun to focus heavily on the job creation potential green building can provide in the wake of the 2009 recession. It received a \$20 million Energy Efficiency and Conservation Block Grant through the federal stimulus program (Grygiel, 2010). The grant provides one-time funding to deliver significant energy efficiency retrofits in residential, commercial, hospital, and municipal buildings in the Central District and Southeast Seattle. The expressed hope is that this work will reduce greenhouse gases while creating thousands of green jobs, tying green initiatives to the City’s economic viability (2011 Adopted & 2012 Endorsed Budget, City of Seattle, 2011).



### Waste

Seattle's management of its waste earned the city its second highest score on the 2011 Siemens Green City Index, with a score of 83.10, well above the average score of the category, 53.20. For the waste category, two indicators were reviewed for the rankings, including the percentage of municipal solid waste recycled, and the city's waste reduction policies.

The City of Seattle has five major areas of focus for its waste prevention programs:

- Reuse of resources
- Onsite organics, including:
  - Residential Backyard Food and Yard Waste Composting
  - Edible Food Recovery
    - Food/Hospitality industries are encouraged to donate surplus food to hunger-relief agencies
    - Seattle Public Utilities assists hunger-relief agencies with grants to fund refrigeration and other equipment enabling agencies to store perishables longer, which allows for the distribution of more food.
  - Restaurant and Institutional Kitchen Efficiency
  - Single-Use Food Service Packaging
- Sustainable building
- Product Stewardship
  - The City of Seattle supports a product stewardship approach for product end-of-life management. It does so through the Northwest Product Stewardship Council, a coalition of governmental organizations, and through its own studies, legislation, and support for state legislation. City and state action places responsibility and costs on producers and users of various products rather than exclusively on solid waste ratepayers. (Seattle Public Utilities).
- Other waste prevention activities

As reported by Seattle, 53.7% of its municipal waste is recycled. As part of its plan to become carbon neutral, Seattle has set a target for the year 2020 of 69% Increased waste diversion rate, and a year 2030 target of above 70% Increased waste diversion rate.

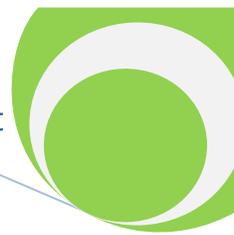
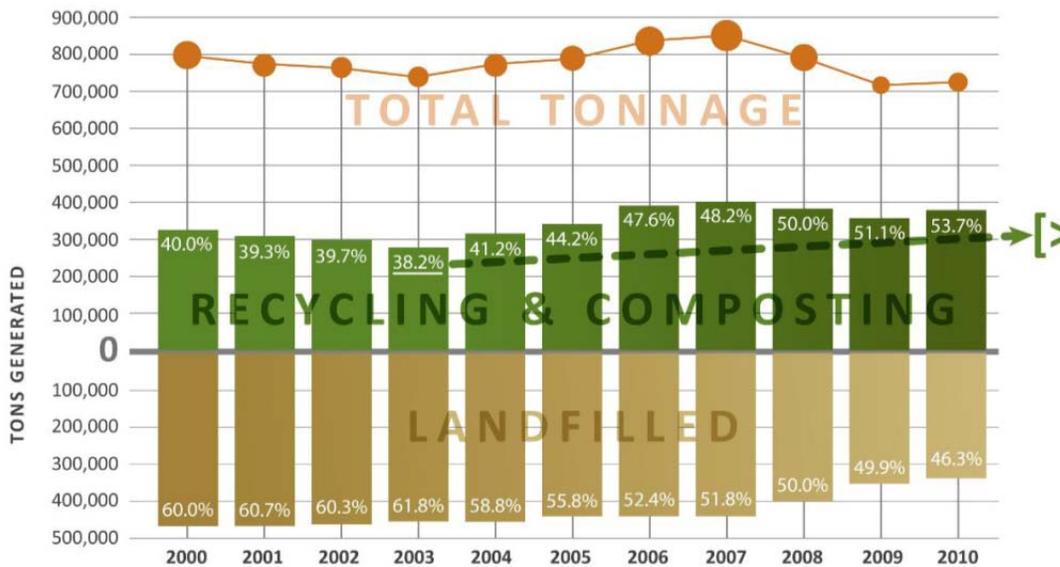


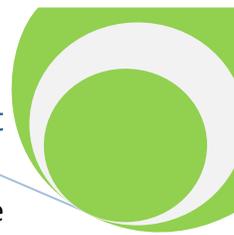
Table 1 illustrates that Seattle’s recycling and composting rates have steadily climbed since 2003.

**Table 1: Recycling and Composting Rate in Seattle**



In addition to its recycling efforts, Seattle has implemented the following processes and initiatives for managing its waste:

- **Landfill Disposal.**
  - The city manages landfill disposal through its contract with Waste Management of Washington for rail haul and disposal of all non-recyclable waste (garbage). The waste goes to their Columbia Ridge Landfill in Gilliam County, Oregon.
- **User Fees**
  - The City of Seattle charges user fees for the non-recyclable waste (garbage) removal, as well as a separate fee for food and yard waste removal. Recycling service is provided at no cost to Seattle residents.
- **Zero Waste Strategy**
  - The Zero Waste Strategy was unanimously adopted by the Seattle City Council on July 16, 2007. The passing of this policy has greatly improved the waste management for the City of Seattle. Several ordinances have been put into place through the Zero Waste Strategy that have helped place Seattle well above a majority of cities in the nation.
- **Plastic Bag Ban**
  - Seattle has passed a plastic bag ban that will go into effect on July 1, 2012. Once in effect, retailers in Seattle will be prohibited from offering plastic carryout bags



to customers. Paper bags will be provided to customers for a minimum of five cents; however these paper bags must be made up of at least 40% of recycled paper. Low income customers who qualify for food assistance programs will receive the paper bags at no charge.

- Do Not Mail Registry
  - The Seattle City Council passed the Do Not Mail registry resolution on January 25, 2010. The ordinance minimizes the volume of unwanted direct mail delivered to Washington residents by calling on the state to provide a Do Not Mail registry. Seattle Public Utilities has a Stop Phone Books initiative as well, where residents can sign up to stop receiving the Yellow Pages.
  
- Styro-foam Regulations
  - The Seattle City Council passed an ordinance prohibiting the use of Styrofoam food service containers and requiring food service business to utilize recyclable and compostable packaging. The ordinance went into effect on July 1, 2010. This program is expected to divert 6,000 tons of plastic and plastic-tainted waste from landfills every year (Siemens, 2011).
  
- Emergency Management
  - Seattle's geography and built environment put it at risk for catastrophic events such as earthquakes, pandemics, and terrorism. Two specific emergency response plans are relevant to the city's solid waste system:
    - **Disaster Debris Management Plan.** The city's Disaster Debris Management Plan sets guidelines for removing and processing debris after a disaster that creates large volumes of waste.
    - **Continuity of Operations Plan.** SPU's Continuity of Operations Plan describes how critical functions, including solid waste, will be maintained in case of a serious emergency. It also sets timeframes for restoring solid waste services.

Although the above reduction efforts were put into place, the recent economic downturn resulted in an unanticipated funding reduction for Seattle government, and the waste reduction efforts were not immune. The recession beginning in 2007 reduced Seattle Public Utilities revenue, which resulted in deep cuts in the waste prevention budget. Most programs, except recyclable and compostable food service packaging will be curtailed, possibly, for several years. For example, Seattle Public Utilities put further study of problem products (toxic and hard-to-recycle materials, or recyclables still unsupported by markets) on hold at the end of 2009 (Seattle Public Utilities, 2009).

### Environmental Governance

Seattle ranked fourth in Environmental Governance in the *Green City Index*. According to the Siemens report, Seattle's high score in environmental governance is reinforced by a



strong green action plan. The formation of environmental targets and regularly published environmental reports strengthens its efforts in becoming greener. The City provides the public with environmental performance information on a project level, increasing transparency and allowing the public to track performance for separate initiatives (Siemens, 2011).

Seattle's commitment to a robust environmental governance program is reflected in the multiple citywide initiatives the City operates. Seattle adopted a Climate Action Plan (CAP) in 2005 with the stated goal of becoming a carbon neutral city by the year 2050. The City convened Technical Advisory Groups (TAGs) to recommend a suite of greenhouse gas reduction strategies in the transportation, land use, building energy and waste sectors. As part of the CAP, the City has undertaken efforts across these four sectors. The City's efforts to reduce greenhouse gas emissions include Seattle City Light becoming the first major utility in the nation to achieve carbon neutrality, the completion of a high-speed light rail linking downtown Seattle to Sea-Tac Airport, and the creation of more than 200 miles of bike lanes (Seattle Climate Action Highlights, City of Seattle, 2010). Seattle agencies also assisted residents in saving energy by going door-to-door to provide energy-efficient light bulbs and made it easier for neighborhood businesses to make energy-efficiency upgrades that cut costs and emissions through administering improvement grants and education programs (Seattle Climate Action Highlights, City of Seattle, 2010).

In addition to the Climate Action Plan, Seattle recently launched the Climate COOLective program in 2010 that assists communities develop and implement a climate change engagement program. The goal of the Climate COOLective program is to leverage diverse community-based networks by giving them the tools, training, and funding needed to carry out campaigns focused on carbon reduction strategies. The 2010 – 2011 program participants tackled issues ranging from implementing no-idle zones at public schools to increasing public transportation usage rates for AFL-CIO union members. This community-based environmental governance program increases community support and buy-in by providing all the necessary resources to develop a carbon emissions program while relinquishing much of the control to the local non-governmental agency (Seattle Climate COOLective Community Action Studio, City of Seattle, 2011).

Funding for both CAP and the Climate COOLective program is derived from regular program funding sources and are managed by the Office of Sustainability and Environment (2011 Adopted & 2012 Endorsed Budget, City of Seattle, 2011). The environmental governance structure erected by the City does not rely upon user service charges, but does rely heavily upon federal, state, and grants. In 2010, the Office of Sustainability and Environment received a plurality of the all City grant awards, totaling \$18.2 million. These funds were not used to fund the department, but rather the Office of Sustainability and Environment acted as a conduit for grants to businesses, individuals, communities, and non-profits acting in accordance with the City's many green initiatives (2011 Adopted & 2012 Endorsed Budget, City of Seattle, 2011).



On October 3, 2011, the City Council unanimously passed a resolution adopting zero net emissions by 2050 as the goal for the Climate Action Plan.

Resolution Number: 31312

<b>Sector</b>	2020 Targets (% reduction compared to 2008)	2030 Targets (% reduction compared to 2008)
<b>Waste</b>	- Increase diversion rate to 69% - 50% reduction in methane emissions commitment per ton of waste disposed	- Increase diversion rate to over 70% - 50% reduction in methane emissions commitment per ton of waste disposed

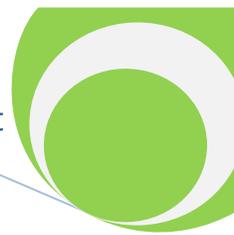


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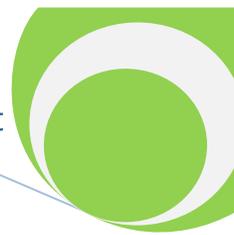
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