

### Module: Introduction

#### Page: Introduction

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#### 0.1

##### Introduction

Please give a general description and introduction to your city.

Houston is the fourth largest city in the United States, with an estimated population of 2.1 million, according to the 2010 U.S. Census. Houston's population is among the youngest and most diverse in the U.S., as well as one of the nation's fastest-growing cities. Houston's economy has a broad industrial base in the energy, aeronautics, and technology industries, and ranks third among areas in Fortune 500 headquarters. The Port of Houston ranks first in the United States in international waterborne tonnage and second in total cargo tonnage. In 2006, the regional Gross Area Product was \$325.5 billion, slightly larger than the Gross Domestic Product of Austria, Poland, or Saudi Arabia. Houston is also home of the Texas Medical Center, the world's largest concentration of healthcare and research institutions, and NASA's Johnson Space Center.

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#### 0.2

##### Emissions Accounting Choice

By checking the boxes below you are indicating that you have fuel and/or GHG emissions data to report at this time.

Select Government to report emissions from your local government operations (also referred to as 'corporate' or 'municipal'); relating to those emissions arising from the operations of the local government.

Select Community to report emissions from the entire city (also referred to as 'geographic' or 'city-wide'); encompassing emissions which are within a particular geopolitical region, over which the city government can exercise a degree of influence through the policies and regulations they implement.

Select both boxes to report fuel and/or emissions for both inventories.

Do not select either box if you have no fuel and/or GHG emissions data to report this year.

Government

## Module: Governance

### Page: Governance

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#### 1.0

**Please describe the process by which the city reviews its progress and manages overall responsibility for climate change.**

When the inventory was first conducted under the previous administration, the Mayor's Office of Environmental Planning measured, monitored, and managed climate-related programs and oversaw reporting for these initiatives. The Multi-Pollutant Emissions Reduction Plan (MERP) from August 2008 calculated GHG emissions for local government operations using 2005 data and outlined a plan to reduce emissions in the city by 2010. Data was gathered from the local utility, city contractors, and other city departments. An update to the MERP was released in December 2009 to document measures that had been completed, were ongoing, or would be completed at a certain future date.

Under the current administration, the Mayor's Office of Sustainability measures, monitors and manages environmental initiatives and coordinates all climate-related reporting for the city. An updated GHG inventory was conducted in 2012 using 2010 data. A similar approach for gathering information and involving key stakeholders to collect data was followed with the new GHG inventory.

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#### 1.1

**Do you provide incentives for management of climate change issues, including the attainment of GHG reduction targets?**

No

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1.1a

Please complete the table.

Who is entitled to benefit from these incentives?	The type of incentives	Program description
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1.2

**Please describe the impact of national and/or regional climate change activities on your city's own climate change activities.**

Houston's Regional Plan for Sustainable Development process seeks to create a locally-driven planning document that entities within the 13-county region can use as a guide for decision-making. The planning process is driven by a 24-member coordinating committee made up of the City of Houston, the Houston-Galveston Area Council, other local governments, non-profits, the private sector, and educational institutions. The plan seeks to address the seven topic areas of economic development, transportation, healthy communities, resiliency, environment, and housing, all intertwined with social equity. Thus far, 15 goals, as well as multiple objectives, metrics and strategies have been created as part of the process. As part of the outreach process, nine workgroups made up of nearly 250 experts, and the interested individuals were created based on topical and geographic areas to help drive and vet the process, along with the public. One of the economic development strategies being presented for consideration is the development of a "buy local, made local, grow local campaign." This, along with the draft strategies, was developed in partnership with the workgroups and coordinating committee. The outcomes of this planning process will greatly inform the City's plan for the community.

## **Module: Risks & Adaptation**

### **Page: Physical Risks**

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2.0

**Do current and/or anticipated effects of climate change present significant physical risks to your city?**

Yes

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**2.0a**

**Please list and describe the effects of climate change which you expect to experience in your city, together with anticipated timescales.**

<b>Effects of climate change</b>	<b>Level of risk</b>	<b>Anticipated timescale in years</b>	<b>Impact description</b>
Hotter summers	Serious	Current	Hotter summers increase energy use in buildings, contribute to higher ozone levels, can be potential causes for brownouts which can lead to increased levels of PM 2.5 and PM 10, and can lead to heat-related illnesses/death.
More frequent heatwaves	Serious	Current	More frequent heatwaves increase energy use in buildings, contribute to higher ozone levels, and can lead to heat-related illnesses/death.
Increased urban heat island effect	Serious		Increased urban heat island effect increases energy use in buildings, does not provide relief for people and animals in the evening, contributes to air pollution, and can lead to heat-related illnesses/death.
More frequent droughts	Serious	Current	More frequent droughts deplete water resources for people and wildlife and cause infrastructure problems. It also leads to drought-stressed trees and vegetation which reduces the urban forest that would normally provide cooling and improve air quality.
Increased risk of storm surges	Serious	Short-term	Increased risk of storm surges cause flooding, property damage, and power outages. It also interferes with communications/telecommunication, destroys habitats and vegetation, and can be adversely affect human health.

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**2.0b**

**Please explain why the anticipated physical effects of climate change present no significant risk to your city.**

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**2.1**

**Please describe any compounding factors that may worsen the physical effects of climate change in your city.**

As the City of Houston experiences more extreme weather events, this will likely change the landscape of many of our open spaces. The most recent example is the loss of millions of trees in the Houston area due to the worst drought in the City's history in 2011. An article published in the Houston Chronicle listed the

compounding factors of losing so many of the City's urban trees (<http://www.chron.com/news/houston-texas/article/Millions-of-trees-likely-to-die-due-to-drought-2153585.php>). Some consequences include increased ground-level ozone and carbon dioxide release from dying trees, insect outbreaks on drought-stressed trees, reduced capacity to cool the air, increased urban heat island areas, loss of habitat and food for wildlife, loss of tourism due to the loss of wildlife habitat.

Overall, Texas lost 301 million trees due to the drought, 19 million in Harris County: <http://www.chron.com/news/article/2011-Texas-drought-slaughtered-301-million-trees-3893965.php>.

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## 2.2

**Do you consider that the physical impacts of climate change could threaten the ability of businesses to operate successfully in your city?**

Yes

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### 2.2a

**Please explain the reasoning behind your response.**

The physical impacts behind extreme weather vary greatly in Houston. The most devastating consequences often result from tropical hurricanes, storm surges, and flooding. As seen with Tropical Storm Allison, the region had 22 fatalities, 95,000 damaged automobiles and trucks, 73,000 damaged residences, 30,000 stranded residents in shelters, and over \$5 billion in property damage.

Hurricane Ike damaged or destroyed over 200,000 homes in the Houston-Galveston region, washed away roads, and rendered drinking water, waste water and electrical utilities inoperable. Power outages reached an estimated 2.8 to 4.5 million customers, shutting down some office operations for weeks. Thousands of businesses suffered physical damage, economic distress, displaced workforce, reduced customer base and extended periods of business interruption. Damage estimates top \$15 billion statewide.

Not only has Houston experienced extreme flooding/hurricanes, but now Houston must contend with extreme droughts, never before seen in recent history. Effects of the extreme drought that hit Houston in 2011, including reservoir depletion, bursting pipes, damaged streets and loss of millions of trees, are still being calculated.

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## 2.3

Please select the primary process or methodology used to evaluate the physical risks to your city.

Primary Methodology	Description
No evaluation done	Fiscal restraints preclude staffing this or contracting it out for a study at this time, though the City is reviewing funding options to fund this evaluation.

**Page: Adaptation**

**3.0**

**Do you have a plan for increasing your city's resilience to the expected physical effects of climate change?**

No

**3.0a**

**Please explain why not and any future arrangements you have to create a plan.**

Individual measures have been implemented as climate-related events have occurred in the City, but no formal overarching adaptation plan has been developed due to limited staff, time, and resources. An adaptation plan is being discussed and considered for the City's update to its climate action plan in 2013.

**3.1**

**Please describe the actions you are taking to reduce the risk to your city's infrastructure, citizens, and businesses from climate changes as identified on the previous page (Q2.0a).**

Effects of climate change	Actions to reduce vulnerability	Action Description
Hotter	Projects or policies	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service

Effects of climate change	Actions to reduce vulnerability	Action Description
summers	targeted at those most vulnerable	centers, and park and recreation centers) to citizens without access to air conditioning during heat waves.
More frequent heatwaves	Projects or policies targeted at those most vulnerable	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service centers, and park and recreation centers) to citizens without access to air conditioning during heat waves.
Increased urban heat island effect	White roofs	Part of Houston's Commercial Energy Conservation Code is a mandate for cool roofs. Low slope roofs up to 2:12 shall be provided with a roof covering where the exterior surface has: (a) a minimum total solar reflectance of 0.70 when tested in accordance with one of the solar reflectance test methods listed below, and (b) a minimum thermal emittance of 0.75 when tested in accordance with one of the thermal emittance test methods listed below.
More frequent droughts	Awareness campaign/education to reduce water use	Mandatory water conservation measures were implemented to stabilize water levels in Lake Houston in the summer of 2011. While restrictions were mandatory, the measures started with warnings and an informational campaign to citizens. Those who did not comply after a warning were issued fines. In addition, to seek recommendations and take action to promote water conservation measures, the Mayor created a Water Conservation Task Force in 2012: <a href="http://www.houstontx.gov/mayor/press/20120713.html">http://www.houstontx.gov/mayor/press/20120713.html</a> . Recommendations are being reviewed now.
Increased risk of storm surges	Crisis planning and practice exercises	The City of Houston acquired 17 SPACE units, which are mobile solar generators made with shipping containers. The generators are designed for emergency relief efforts and were purchased to serve in the recovery efforts from future hurricanes. The units contain refrigerators and air conditioning to provide relief and also to allow emergency equipment to be hooked up when needed.

### 3.2

**Please describe any other efforts you have undertaken or will undertake to ensure business and operational continuity - for both the city government and the businesses located in your city - in the event of a significant weather-related event.**

The City of Houston Mayor's Office of Emergency Management (OEM) provides programs and activities to City residents and departments to help them prepare for, cope with and recover from the effects of natural and manmade disasters. The Emergency Operations Center (EOC) is a centralized facility responsible for coordinating emergency management and response functions citywide. The EOC, when activated, is staffed by representatives from various City, Regional and Federal agencies as well as not-for-profit and private-sector partners. It can be modified to meet the specific needs of the given emergency. The EOC serves primarily as a base of operations for City elected and appointed officials to coordinate activities which save lives and property, while leaving the direct command of resources to emergency services personnel on the scene of the incident.

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4.0

Does your city face any social risks as a result of climate change?

Yes

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4.0a

Please complete the table

Social impacts of climate change	Impact description
Fluctuating socio-economic conditions	With longer heat events, at-risk populations that have limited access to cooling centers or do not have air-conditioning units within their place of residence are more susceptible to facing heat-related illnesses or death.
Increased conflict and/or crime	Loss of power after extreme weather events, such as hurricanes, can mean higher incidence of crime (e.g. looting and theft), as seen in the aftermath of Hurricane Ike.
Increased incidence and prevalence of disease	During times of heavy rain events, flooding can occur, and if the ground is oversaturated, pools of water can attract mosquitoes, which can increase the prevalence of mosquito-borne diseases.

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4.0b

Please explain why not.



5.0

Does climate change present any economic opportunities for your city?

Yes

5.0a

Please indicate the opportunities and describe how the city is positioning itself to take advantage of them.

Economic Opportunity	Describe how the city is maximizing this opportunity
Development of new business industries (e.g. clean tech)	Houston is often regarded as a hub for the world's leading energy companies, but it is also gaining momentum on growing a clean energy job market. According to Clean Edge, Inc., Houston jumped from 15th to 8th for Top Cities for Clean Tech jobs in 2009. Also, more than 13.5 percent of the nation's total biodiesel production capacity resides in the Houston region. The National Biodiesel Board reports that the Gulf Coast region is home to both the nation's largest and 3rd largest biodiesel plants. From bioenergy companies to biotechnology firms, the city encourages and welcomes new economic development in the clean energy sector.
Other: Green jobs	According to the U.S. Conference of Mayors, Houston ranked 3rd in the nation for current and potential green jobs. The report identified 21,250 green jobs in the Houston metro area during 2006, with an expected new green job growth of 168,136 through 2038.
Increased attention to other environmental concerns	As more people notice extreme weather events occurring in Houston, there is more attention placed on how the community needs to be more resilient. For instance, after the major drought in 2011, residents were increasingly inquiring about installing rainwater harvesting and the City's annual half-price rain barrel sale.
Increased infrastructure investment	ReBuild Houston is the City of Houston's initiative to improve the quality of life and mobility for residents of the city by rebuilding its drainage and street infrastructure. To support the initiative, the city has established a dedicated, pay-as-you-go fund to maintain the infrastructure, and to plan upgrades to meet future needs as the city grows: <a href="http://www.rebuildhouston.org/">http://www.rebuildhouston.org/</a>
Improved efficiency of operations	In the City's municipal energy efficiency program, 6 million square feet, are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The most recent tranche of work has occurred in the City's Parks and Recreation Department: over \$10 million in energy efficiency retrofits. The next tranche of work, for 2013, will occur in the City's libraries: over \$8 million in energy efficiency retrofits.

5.0b

Why not?

## Module: Emissions - Local Government Operations

### Page: Local Government - Methodology

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#### LGO1.0

Please state the dates of the accounting year or 12-month period for which you are reporting a GHG measurement inventory for your local government operations.

Fri 01 Jan 2010 - Fri 31 Dec 2010

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#### LGO1.1

Please indicate the category that best describes the boundary of your municipal GHG emissions inventory.

Companies, entities or departments over which operational control is exercised

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#### LGO1.2

Please indicate which of the following major sources of emissions are included in your municipal GHG emissions inventory.

Source of emissions	Status
Airport(s)	Included
Buildings	Included
Buses	Not applicable
Electricity generation	Not applicable

Source of emissions	Status
Electricity transmission and distribution	Not applicable
Employee commuting	Included
Incineration of waste	Not applicable
Landfills	Not applicable
Local trains	Not applicable
Maritime port	Not applicable
Municipal vehicle fleet	Included
Regional trains	Not applicable
Roads / highways	Not applicable
Street lighting and traffic signals	Included
Subway / underground	Not applicable
Thermal energy	Not applicable
Waste collection	Included
Wastewater treatment	Included
Water supply	Included

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### LGO1.3

**Please give the name of the primary protocol, standard or methodology you have used to calculate GHG emissions.**

Local Government Operations Protocol (ICLEI/The Climate Registry/California Climate Action Registry/California Air Resources Board)

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### LGO1.3a

**Please explain your methodology (including use of additional protocol), methods of calculation, and processes for data collection.**

The Local Government Operations Protocol (LGOP) has been widely used for other municipal GHG emissions inventories in the U.S. and was the most applicable for our reporting. Only this methodology was used.

**Page: Local Government - Energy Data**

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**LGO1.4**

Please give the total amount of fuel that your local government has consumed this year.

Fuel	Amount	Units
Natural gas	71167000000	Btu

**LGO1.5**

How much electricity, heat, steam, and cooling has your local government purchased for its own consumption during the reporting year?

Type	Amount	Units
Electricity	1980857335	kWh

**Page: Local Government - GHG Emissions Data**

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**LGO1.6**

Please provide total (Scope 1 +Scope 2) GHG emissions for your local government's operations, in metric tonnes CO2e.

1227491

**LGO1.7**

If applicable, please provide the following GHG emissions.

Scopes are a common categorization method.

**Scope 1: All direct GHG emissions (with the exception of direct CO2 emissions from biogenic sources).**  
**Scope 2: Indirect GHG emissions associated with the consumption of purchased or acquired electricity, steam, heating, or cooling.**

Total Scope 1 activity in metric tonnes CO2e emitted	Total Scope 2 activity in metric tonnes CO2e emitted
91047	1136444

**LGO1.8**

**Do you measure Scope 3 emissions?**

Yes

**LGO1.8a**

**Please complete the table.**

Source	Emissions (metric tonnes CO2e)	Comment
Solid Waste Facilities	226314	This measures both Municipal and Residential Waste

**LGO1.8b**

Please explain why not and detail your plans to do so in the future, if any.

**LGO1.9**

Where it will facilitate a greater understanding of your government emissions, please provide a breakdown of these emissions by department, facility, greenhouse gas (CO2, CH4, N2O etc) or by any other classification system used in your city.

Department / Facility / GHG / Other	Type	Emissions (metric tonnes CO2e)
Convention & Entertainment: Buildings and Facilities	Scope 2	32650
General Services: Buildings and Facilities	Scope 2	37092
Health & Human Services: Buildings	Scope 2	15516
Houston Airport System: Buildings and Facilities	Scope 2	132836
Library: Buildings	Scope 2	16062
Municipal Courts: Buildings	Scope 2	3028
Park & Recreation: Buildings	Scope 2	29698
Public Works: Buildings	Scope 2	445451
Solid Waste: Buildings	Scope 2	2175
Vehicle Fleet	Scope 1	87264
Street Lights	Scope 2	65093
Freeway Lights	Scope 2	13510
Water Production and Wastewater Treatment	Scope 2	340346
Traffic Signals	Scope 2	6770

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#### LGO1.11

**Please explain why your emissions have increased, decreased, or stayed the same from the previous year.**

The City's Local Government Operations Emissions for 2010 have realized a 26% decrease from the 2005 GHG emissions inventory. The City has committed and invested in many programs that reduce cost, improve efficiencies, and decrease GHG emissions. From the municipal energy efficiency retrofit program that upgraded 6 million square feet of the City's buildings to achieve 30% energy reductions to increasing the City's hybrid and electric fleet, these programs have helped the City achieve and surpass its original 2010 emissions goal as stated in its Multi-Pollutant Emissions Reduction Plan in 2008.

**Page: Local Government - External Verification**

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#### LGO1.12

Has the GHG emissions data you are currently reporting been externally verified or audited in part or in whole?

No

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**LGO1.12a**

Please provide any other relevant information about the emissions verification process.

Due to budget constraints, no external auditor verified the inventory. Future plans to seek third party verification of updated emissions inventory is under consideration.

**Module: Strategy**

**Page: GHG Emissions Reduction - Local Government Operations**

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**6.0**

Do you have a GHG emissions reduction target in place for your city government operations?

Yes

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**6.0a**

Please provide details of your reduction target.

Baseline year	Baseline emissions (metric tonnes CO2e)	Percentage reduction target	GHG sources to which the target applies	Target date	Comment
2005	1968848	5%	Energy	Other: 2007	The City has surpassed its reduction goal, achieving 26% GHG reduction in 2010.

6.0b

Please explain why you do not have an emissions reduction target.

6.1

What activities are you undertaking to reduce your emissions in your local government operations?

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
Energy Demand in Buildings > Building codes and standards	Not calculated	The City adopted a Green Building Resolution, which set a target of LEED Silver certification for new construction, replacement facilities and major renovations of City of Houston-owned buildings. As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Energy Demand in Buildings > Energy efficiency/retrofit measures	9200	The energy reduction measures originally identified by the Houston Airport System (such as installing motion detectors for lighting specific interior areas, installing control measures such as photo cells, clocks and/or timers on all outside lighting, cutting the energy supply to unoccupied retail space, and requiring lights in electrical closets be turned off when not in use) mostly have been implemented. Additional measures targeted HVAC systems of the HAS Administration Building and the Technical Services Buildings. HVAC systems are now shut off when the buildings are not in use. It is important to note that the Houston Airport System is experiencing a period of accelerated growth. This needs to be monitored to ensure that the progress achieved to date is not negated by expected growth. The General Services Department instituted a supply-side energy management program in 2006. 6.5 million square feet of municipal buildings have been retrofitted since 2008. The City purchased 186 energy misers, energy saving devices, for cold beverage vending machines in City facilities.
Finance > ESCO financing	24000	A total of 297 City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years. The City will use



Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
		Qualified Energy Conservation Bonds (QECBs) to fund the next tranche of energy efficiency work in the City's libraries.
Energy Supply > Clean energy procurement strategies	270000	Starting in 2010 and continuing into 2012, the City of Houston has been designated as the number one municipal purchaser of green power and the sixth largest overall purchaser in the nation, according to the U.S. Environmental Protection Agency (EPA). The City currently purchases 50 megawatts, or 35% of the total electricity load, from wind farms and has a goal to increase the city's usage of green power to 50% in 2013.
Transport > Improve fuel economy and reduce CO2 from motorized vehicles	1500	The City of Houston is replacing older, high mileage equipment in order to reduce current and future maintenance costs, increase vehicle reliability, and decrease emissions. Three specific measures have been planned to achieve this goal of Fleet Use and Replacement – Reduce fleet size, Rejuvenate the current fleet, and Better track/monitor fleet. The City has the 4th largest municipal hybrid fleet in the nation. Approximately 50 percent of the City's nonspecialty, light-duty fleet have been replaced with hybrid vehicles. 25 Nissan Leafs are currently in the municipal fleet and more to be added in 2013. The City is consolidating its motor pool, resulting in a 34 percent decrease in the size of the City fleet, 35,000 gallons of fuel savings, and reduced emissions. The City also has an anti-idling policy for municipal vehicles (A-P 2-2 Section 7.2.29).
Outdoor Lighting > LED / CFL / other luminaire technologies	7000	The City has completed replacing the incandescent bulbs at all of its 2,450 signalized intersections with LEDs, which are 75% more energy efficient. In addition, the City is now realizing over \$3.6 million a year in savings or around \$10,000 in savings per day.
Waste > Recycling or composting collections and/or facilities	1000	The City recycles in all City facilities. The new recycling program expanded the recycling opportunities at City building and facilities to include plastics # 1- 7 (except Styrofoam and film bags); aluminum and bi- metal cans; glass and cardboard in addition to all types of paper. The City launched a mandatory yard waste composting program in April 2010 and has diverted 60,000 tons of yard waste in the last year, with disposal savings of \$2 million. Houston's new proposed program, One Bin for All, which will allow residents to discard all materials in one bin, treating trash as valuable assets, dramatically increasing recycling using game changing technologies, will also be applied to the municipal sector.
Urban Land Use > Urban agriculture	Not calculated	The City Gardens and Farmers Market Initiative supports urban gardens and markets that inspire and empower people of diverse backgrounds to grow, eat and buy local and organic food. The initiative improves health and nutrition, creates community and supports valuable local businesses that together sustain and improve the environment. The City Gardens and Farmers Market initiative includes: <ul style="list-style-type: none"> <li>• City Gardens at Bob Lanier Public Works Building: 25 vegetable container gardens on both sides of a 27-story skyscraper in downtown Houston.</li> <li>• City Hall Victory Garden: 20 vegetable container gardens, berry trestle and fruit trees in Tranquility Park, next to City Hall.</li> <li>• Houston Permitting Center: Five raised garden beds next to an adaptive reuse building that is going for LEED Gold Certification.</li> <li>• City Hall Farmers Market: supports local and organic farmers and assists over 40 "micro businesses" through a weekly Wednesday farmer's market at City Hall. The public can enjoy lunch from vendors or pick up groceries while at the same time supporting local,</li> </ul>

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
		fresh and sustainable food all amidst Houston's dramatic downtown urban setting. Top chefs perform cooking demos and there are weekly musical guests. And non-profits often bring youth to the market.
Transport > Improve fuel economy and reduce CO2 from motorized vehicles	Not calculated	The City started Houston Fleet Share in August 2012. Through this program, 50 city-owned fleet vehicles – including 25 Nissan Leaf EVs and other plug-in electric and hybrid vehicles – were outfitted with Zipcar's proprietary car sharing technology for use by city employees across numerous departments. This program is the first of its kind to utilize electric vehicles. The program is designed to help the City of Houston improve efficiency, promote sustainability and save money - all without sacrificing employee mobility.

**Page: GHG Emissions Reduction - Community**

**7.0**

**Do you have a GHG emissions reduction target in place for your community?**

No

**7.0a**

Please provide details of your reduction target.

Baseline year	Baseline emissions (metric tonnes CO2e)	Percentage reduction target	GHG sources to which the target applies	Target date	Comment

**7.0b**

Please explain why you do not have an emissions reduction target.

The City will be creating a community-wide climate action plan with emissions reductions targets in 2013/2014. The completion of the "Our Regional Plan for Sustainable Development" document in 2013 will help inform the community-wide plan for Houston.

7.1

**What activities are you currently undertaking to reduce emissions city-wide?**

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
Energy Demand in Buildings > Building codes and standards	Not calculated	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Transport > Infrastructure for non-motorized transport	Not calculated	The City of Houston offers over 300 miles interconnected bikeway network spanning across 500 square miles. The network includes bike lanes, bike routes, signed-shared lanes and shared-use paths, commonly referred to as 'hike and bike' trails, which includes rails to trails, and other urban multi-use paths. In addition to these bicyclist transportation facilities, there are over 80 miles of hike and bike and nature trails found in City of Houston parks.
Transport > Improve the accessibility to public transit systems	Not calculated	Houston METRO's comprehensive light rail plan plays a dynamic role in the city's life, providing smarter, more energy-efficient transportation options in the form of five new rail lines. The lines will connect citizens and visitors to every major activity center in our metropolitan area. They'll provide exceptional new opportunities for residents and businesses alike. METRO is the local transportation authority. Currently, Houston is expanding its light-rail infrastructure with three new light-rail lines currently under construction and two more in the works, going from 7.5 miles to 39 miles. With this \$4 billion investment, the expanded light-rail system will be an essential element of the city's plans to meet the transportation and environmental challenges of today and tomorrow, easing our growing traffic congestion, improving the city's air quality and changing the way Houston moves.
Waste > Recycling or composting collections and/or facilities	Not calculated	The City launched a mandatory yard waste composting program in April 2010 and has diverted 60,000 tons of yard waste in the last year, with disposal savings of \$2 million. The City has also deployed single stream recycling to one-third of single-family households and is working on full deployment.
Energy Demand in Buildings > Financing mechanisms for retrofit	Not calculated	The City of Houston launched the Energy Efficiency Incentive Program allowing eligible commercial building owners to apply for funding to make energy efficiency improvements and reduce utility expenses and greenhouse gases. The City has committed approximately \$3 million for the program and will provide incentives to offset the up-front implementation costs. Over half the funds have been set aside for Class B and C buildings.
Other: Energy Efficiency and	Not calculated	The Houston Green Office Challenge ( <a href="http://www.houstongoc.org">www.houstongoc.org</a> ), launched in September 2010, invites commercial office owners/managers and tenants in Houston to increase their environmental and economic performance in

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
Behavior Change > Houston Green Office Challenge		cleaner transportation choices, energy conservation, property management/tenant engagement, water efficiency and waste reduction. To date, the Houston Green Office Challenge has over 400 businesses, representing more than 70 million square feet of office space, participating in the program. The City plans to continue the program for a second year to enable participants to fully implement their sustainability initiatives. The program also will be expanded to include other businesses, including NASA's Johnson Space Center and the Houston Independent school District. In 2011, Mayor Annise Parker, and the Houston Green Office Challenge and Energy Efficiency Incentive Program, were selected as the nation's top winner for large cities in the 2011 Mayors' Climate Protection Awards, an initiative sponsored by the U.S. Conference of Mayors. The annual awards program recognizes mayors for innovative practices in their cities that increase energy efficiency and reduce greenhouse gas emissions. In the first year, Green Office Challenge participants collectively reduced energy usage by 28 million kilowatt hours, reduced water usage by 74 million gallons, and more than 90 percent recycled in the office, diverting 40 percent of waste from the landfill.
Other: Bike Share	Not calculated	The City launched its bike share program, Houston Bike Share, in May 2012, which is an active transportation alternative for the City. Houston's initial phase has been successful and, received funding support from Blue Cross Blue Shield TX and the US Department of Energy, totaling nearly \$2 million. On April 3, 2013, Houston B-cycle, expanded from 3 to 21 stations and from 18 to 175 bicycles. This Phase II expansion creates a presence not only in Downtown, but also in the East End, Midtown, Montrose and the Museum District/Hermann Park with four of the stations located at key METRORail stops. Phase III expansion discussions and planning include the Texas Medical Center and local universities, as well as additional neighborhoods. Pollution, traffic, and rising oil costs are just a few of the reasons why Houstonians need options for getting around. <a href="http://www.houston.bcycle.com">www.houston.bcycle.com</a>
Transport > Improve fuel economy and reduce CO2 from motorized vehicles	Not calculated	The City has installed many electric vehicle charging stations - some for municipal use and some for public use. 28 Blink charging stations were installed for public use, many in parks and libraries, in 2011 and 2012 using grant funding. The City has been working with Ecotality on the EV Project and will be installing another 68 Blink charging stations in 2013, mostly for public use. It also has 25 Gridbot and 15 Chargepoint charging stations for municipal fleet use only. Electric vehicle supply equipment companies have also been working with private businesses to install charging stations in parking lots for public use.
Food > Promotion of climate smart eating habits	Not calculated	In November 2012, the City launched the Urban Grows initiative. Urban Grows, part of the City of Houston's Healthy Houston initiative, aims to help communities build vegetable gardens, farms and orchards on vacant land in areas with poor access to healthy fresh foods, often referred to as food deserts. The City of Houston will provide lots through its LARA program (Land Assemblage Redevelopment Authority), which works to redevelop tax-delinquent and abandoned properties. Community members, partnering with local non-profits, foundations or churches, will then work to transform these vacant lots into usable, productive and attractive green spaces. Urban Grows is the first initiative launched as part of Mayor Parker's new program, Healthy Houston, which is designed to reduce obesity and increase healthy eating and exercise. Healthy Houston will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
		<p>the development of sustainable food systems and promote recreational opportunities. Urban Grows will:</p> <ul style="list-style-type: none"> <li>• Encourage urban agriculture in neighborhoods, utilizing vacant City property</li> <li>• Improve access to healthy, affordable and locally produced food for all neighborhoods</li> <li>• Support education regarding the benefits of sustainable agriculture</li> </ul> <p>Urban Grows will complement the City's existing efforts, including the launch of the City Hall Farmers Market and farmers markets at the City's multi-service centers; new vegetable container gardens downtown and throughout the City; a Grocery Access Task Force that works with grocers on providing economic tools and incentives to help spur more supermarket and grocery development in areas where they are needed; the launch of Bike Share in Houston and the expansion of bike lanes and trails.</p>
Urban Land Use > Greenspace and/or bio-diversity preservation and expansion	Not calculated	<p>Also, in November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and</li> <li>• Change in Houston's image to attract the best and brightest to our city.</li> </ul> <p><a href="http://www.houstonparksboard.org/projects/bayou_greenways_initiative.php">http://www.houstonparksboard.org/projects/bayou_greenways_initiative.php</a></p>
Waste > Recycling or composting collections and/or facilities	3.72 tonnes CO2e per ton of MSW diverted; emissions reduction overtime not calculated	<p>The City is proposing a new technological innovation, One Bin for All, that will allow residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This innovation was chosen by Bloomberg Philanthropies as one of 5 winners (out of 305 submissions) of the Mayors Challenge, a competition to incentivize innovation in city government and improve citizens' lives. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Houston's innovation will:</p> <ul style="list-style-type: none"> <li>• Provide every residence with curbside One Bin for All services;</li> <li>• Decrease the volume of waste sent to landfills;</li> <li>• Reduce air pollution; and,</li> <li>• Manage waste and recycling costs.</li> </ul> <p>Houston will divert up to 75% of its waste. Houston has</p>

Emissions reduction activity	Anticipated emissions reduction over lifetime (metric tonnes CO2e)	Action description
		evidence the technology can work, significantly increasing its recycling rate at a price that is affordable. For more information, please visit <a href="http://www.huffingtonpost.com/annise-parker/mayors-challenge-houston-_b_2711153.html?utm_hp_ref=fb&amp;src=sp&amp;comm_ref=false">http://www.huffingtonpost.com/annise-parker/mayors-challenge-houston-_b_2711153.html?utm_hp_ref=fb&amp;src=sp&amp;comm_ref=false</a> .

**Page: Planning**

**8.0**

**List any climate change-related projects for which you hope to attract private sector involvement.**

Houston Green Office Challenge, Department of Energy's Better Buildings Challenge, Houston Bike Share, Houston Drives Electric, Gulf Coast Green conference, annual rainwater harvesting/composting bin sales, Urban Grows (urban gardens and agriculture), City Hall Farmers Market and One Bin for All.

**8.1**

**Does your city incorporate desired GHG reductions into the master planning for the city?**

Yes

**8.1a**

**Please describe the ways that the master plan is designed to reduce GHG emissions.**

The City is in the middle of a federally funded Sustainable Community Grant that looks at work, live, play. This grant includes a case study that helps the City think about the rules that the City would develop to incentivize (through relaxation of rules) sustainable development.

The vision is to create vibrant Urban Centers in Houston where people from all walks of life can live, work and play. These Urban Centers will be in varying sizes and will provide better connections between destinations in the City; better coordination of land development standards with transportation investments and related regulations; real housing choice for everyone; the elimination of food deserts where they currently exist; more walkable and bikeable areas with a balance of housing and jobs, and transportation choices that will decrease household transportation costs and the air pollution and traffic congestion associated with a very high percentage of single-passenger vehicle trips per day. This will lead to improved air quality, reduced greenhouse gas emissions and promote public health which results in an enhanced quality of life for all Houstonians.

Project Goals:

1. Advance local and regional housing needs.
2. Contribute to high-quality infrastructure.
3. Encourage economic viability and diversity.
4. Enhance community stability, accessibility and equity.
5. Promote sustainable, healthy design.
6. Support multimodal transportation and increased connectivity.

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8.2

**Please describe any renewable energy targets or goals and how the city plans to meet those targets.**

Currently, green power accounts for 35% of the City's electricity usage with a stated mayoral goal of achieving 50% in 2013. The 50% purchase should be complete by April, 2013.

**Page: Water**

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9.0

**Do you foresee substantive risks to your city's water supply in the short or long term?**

Yes

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9.0a

**Please identify the risks to your city's water supply as well as the timescale.**

Risks	Timescale	Risk description
Flooding	Short-term	Houston is in a flood-prone area due to its proximity to the coast and low elevation.
Inadequate or aging infrastructure	Medium-term	During the extreme drought in 2011, a combination of hot weather and aging water pipes caused 700 breaks a day along 7,000 miles of pipes in Houston. The pipes were breaking due to being weakened and corroded with age and soil too dry to handle the expansion of the pipes. Without the soil against the pipes to help contain the pressure, the pipes broke.

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### 9.0b

**Please describe the actions (on the supply and demand side) you are taking to reduce the risks to your city's water supply.**

The City is always looking for ways to be more efficient in its operations. The Drinking Water Operations group has active participation and has partnered with state programs, public utilities and other organizations in the State of Texas who are conducting water research studies associated with future water planning, water conservation and potable water reuse in the area.

The City has also committed both manpower and resources (with a budget close to \$500K this year) in support of its Waterworks Education Center, which currently serves as an education center for water-related efforts in our community.

The water utility has water conservation targets of reducing unaccounted water use in the amount of 10% by 2020. This target was a recommendation by the Texas Water Development Board in 2009 and is part of the City's current conservation plan. In November 2012, the City of Houston passed amendments to the Chapter 47 Water and Sewers Ordinance. Sections 47-251 through 47-254 address water use reductions, during various stages of a water shortage, that range from 5% to 35%.

In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.

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### 9.0c



Please explain why you do not consider your city to be exposed to any substantive water-related risk

**Module: C40**

**Page: City Overview**

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**V0.1**

**Does the Mayor have a statutory duty (legal ability) in relation to the reduction of greenhouse gases?**

No

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**V0.2**

**Has a Carbon Reduction or Climate Change Strategy (or similar document) been published by the Mayor?**

Yes

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**V0.3**

**Please provide a web link to your Climate Change Strategy.**

<http://www.greenhoustontx.gov/reports/emissionreduction20080909.pdf>

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**V0.4**

**In what year was your Climate Change Strategy published?**

2008

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**V0.5**

### What are the priorities of your Climate Change Strategy?

The priorities target buildings and structures, mobile sources, and waste. The 14 strategies involve purchasing wind energy, facility retrofits with Energy Savings Company Financing, LED Traffic Signals, Houston Airport System's Environmental Initiatives, Citywide Lighting Retrofit Project, Energy efficient Vending Machines and Vending Misers, LEED Certification for Construction of City Buildings, Combined Heat and Power System at Wastewater Treatment Facilities, Fleet Use and Replacement, The Mayor's Hybrid Initiative, Texas Emissions Reduction Plan, Emerging Technology, Recycling Program for All City Facilities, and Recycling Program for Residents.

The City's Climate Change Strategy will be updated in 2013, and will reflect many of the City's recent sustainability initiatives, detailed throughout the C40 questionnaire.

Many initiatives and programs can be found on the City's GreenHoustonTx website: [www.greenhoustontx.gov](http://www.greenhoustontx.gov). The Mayor's Office of Sustainability also provides information through its Twitter, Facebook, Instagram and YouTube accounts (handle is greenhoustontx).

Other specific websites that provide detailed information about the City's sustainability initiatives:

1. Houston Green Office Challenge: [www.houstongoc.org](http://www.houstongoc.org)
2. Green Building Resource Center: [www.codegreenhouston.org](http://www.codegreenhouston.org)
3. Houston Bike Share: [www.houston.bcycle.com](http://www.houston.bcycle.com)
4. Houston Drives Electric: [www.greenhoustontx.gov/ev](http://www.greenhoustontx.gov/ev)
5. Rebuild Houston: [www.rebuildhouston.org](http://www.rebuildhouston.org)

## Page: Transport (Mass Transit)

### TM0.1

What is the modal split for transport, i.e. the proportion of trips made by each?

Transport Modes	Percentage
Private motorized transport	74%
Rail/Metro/Tram	1%
Buses	4%
Ferries/ River boats	
Walking	2%
Taxi	1%
Cycling	1%
Other	17%

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**TM0.2**

What is the breakdown of CO2e emissions by transport mode in your city?

Transport Modes	Percentage
Private motorized transport	78%
Rail/Metro/Tram	1%
Buses	6%
Ferries/ River boats	
Walking	
Taxi	1%
Cycling	
Other	14%

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**TM0.3**

What is the city's total daily passenger kilometers for each of the following transport modes?

Transport Modes	Passenger Kilometers
Private motorized transport	149411497
Rail/Metro/Tram	137
Buses	2384240
Ferries/ River boats	
Walking	
Taxi	
Cycling	
Other	

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**TM1.0**

**Is your city taking action on improving bus infrastructure?**

Yes

**TM1.0a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Provide more bus shelters	Program	Currently in effect [city-wide]	Yes	The Passenger Bus Shelter Program is an initiative to install bus shelters throughout the METRO service area. The program consists of the design and construction of new shelter foundations, as well as the fabrication and installation of standard passenger bus shelters. This program reinforces METRO's commitment to reinvesting in the agency's bus system backbone. Public response has been very positive. Installation of shelters has been shown to increase ridership at a given bus stop by an average of 20 additional riders per day. Bus shelters provide patrons both safety and protection from the elements. The Board is funding 100 new bus shelters per year. <a href="http://www.ridemetro.org/CurrentProjects/BusShelterProgram.aspx">http://www.ridemetro.org/CurrentProjects/BusShelterProgram.aspx</a>	Yes
Upgrade buses to increase accessibility	Program	Currently in effect at a significant scale across most of the city	Yes	Shaded paths to bus stops are available at numerous bus stops across the city. Also, in the Houston-Galveston Area Council Livable Centers studies, there are recommendations for improved sidewalk connectivity and more street trees, which will increase accessibility of bus services. <a href="http://videos.h-gac.com/CE/livablecenters/Downtown-EaDo_Livable_Centers_Study.pdf">http://videos.h-gac.com/CE/livablecenters/Downtown-EaDo_Livable_Centers_Study.pdf</a>	Yes

**TM1.1**

**Is your city taking action on increasing the reach of bus services?**

Yes

**TM1.1a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Increase routes, frequency and night services	Program	Still under consideration or awaiting final authorization	Yes	METRO will be embarking on a System Re-imagining project in 2013. This 12 month project will involve "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, will look to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components.	Yes
Increase the number of bus stops	Program	Still under consideration or awaiting final authorization	Yes	METRO will be embarking on a System Re-imagining project in 2013. This 12 month project will involve "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, will look to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components.	Yes
Reduce fares				Not applicable	Yes

**TM1.2**

Is your city taking action on improving bus transit times?

Yes

TM1.2a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Bus rapid transit	Program	Still under consideration or awaiting final authorization	Yes	METRO will be embarking on a System Re-imagining project in 2013. This 12 month project will involve "re-imagining" the METROBus system from the ground up, using a completely blank slate approach. This consultant-led study, involving significant community outreach and involvement, will look to define goals and objectives for the transit system, what kind of transit services should METRO be providing, and then develop a fiscally-constrained 5-Year Transit Service Plan with both capital and operating components. An important component of METRO's regional mobility plan, Signature Service is based on the successful Bus Rapid Transit model. The result: METRO's 402 Quickline Bellaire route provides faster travel and fewer stops aboard high-end hybrid vehicles, plus greater reliability and increased customer convenience through the use of integrated technology, infrastructure and operational investments. <a href="http://www.ridemetro.org/Services/Bus/Quickline_SignatureService.aspx">http://www.ridemetro.org/Services/Bus/Quickline_SignatureService.aspx</a> Uptown/Galleria is considering a bus rapid transit system to service the district.	Yes
Priority lanes	Program	Currently in effect [city-wide]	Yes	Priority lanes for buses include the HOV lane, HOT Lanes, and diamond lanes downtown that give priority to buses during peak hours. <a href="http://www.ridemetro.org/Services/HOTLanes.aspx">http://www.ridemetro.org/Services/HOTLanes.aspx</a>	Yes
Bus priority at traffic lights	Program	Still under consideration or awaiting final authorization	Yes	The new 402 Quickline Bellaire operates with the efficiency of METRORail by offering limited stops to popular business centers all along the line. The new Quickline features eight state-of-the-art bus stations complete with digital "next bus" signage to inform riders when the bus will arrive. In addition, a bright blue road stripe has been painted along the entire route for easy identification. The Quickline bus also has priority at traffic lights.	Yes

TM1.3

Is your city taking action on improving bus fuel economy and reducing CO2e?

Yes

**TM1.3a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Switch buses to hybrid engines	Program	Currently in effect [city-wide]	Yes	METRO operates 400 diesel-hybrid electric buses, which accounts for 1/3 its fleet.	Yes
Switch buses to electric engines				Not applicable	
Bio fuels				Not applicable	
CNG	Program	Currently in effect and being piloted	Yes	Free and convenient transportation has returned to downtown with Greenlink. Through a partnership between the Downtown District, BG Group and Houston First Corporation, the downtown community can utilize the environmentally-friendly buses to get to popular downtown locations quickly. The buses run on Compressed Natural Gas (CNG), making them a cleaner transportation alternative. Greenlink is operated by METRO through an interlocal agreement with the Downtown District. This is a pilot program utilizing a CNG bus, and METRO is looking to expand its fleet with more CNG buses.	Yes
Promote fuel-efficient driving and reduce idling	Policy / Regulation	Currently in effect [city-wide]	Yes	All METRO buses are programmed to automatically shut down after 20 minutes of idling.	Yes
High efficiency, ultra-low emission buses	Program	Currently in effect [city-wide]	Yes	METRO uses ultra low-sulphur diesel for their diesel-hybrid electric buses.	Yes

**TM1.4**

**Is your city taking action on improving rail, metro and tram infrastructure?**

Yes

**TM1.4a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Improve station facilities	Program	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with three new light-rail lines currently under construction and two more in the works, going from 7.5 miles to 39 miles, spending over \$4 billion to improve the system. The expanded light-rail system is an essential element of the city's plans to meet the transportation and environmental challenges of today and tomorrow, easing the growing traffic congestion, improving air quality and changing the way Houston moves. Upgrades of existing station facilities will match the new facilities. Facility upgrades include security upgrades (HD camera), updated fare equipment on the platform, and new communication equipment.	Yes
Increase number of carriages	Program	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with three new light-rail lines currently under construction and two more in the works, going from 7.5 miles to 39 miles, spending over \$4 billion to improve the system. METRO will be adding 19 new Siemens H2 S70 trains to its light rail fleet.	Yes

**TM1.5**

**Is your city taking action on increasing the reach of rail, metro and tram services?**

Yes



TM1.5a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Increase routes, frequency and night services	Program	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with a \$4 billion investment. Three new light-rail lines are currently under construction, and two more are in the works, going from 7.5 miles to 39 miles. Night services will match existing schedules, and frequency will remain at 6 minute intervals. METRO has a 1 percent sales and use tax imposed within METRO's service area for transit activities. By voter mandate, METRO dedicates 25 percent of its sales tax for the General Mobility Program. Most of this funding is passed on to the city of Houston, Harris County and 14 multi-cities for general mobility projects.	Yes
Increase the number of rail stations	Program	Currently in effect at a significant scale across most of the city	Yes	Houston is expanding its light-rail infrastructure with a \$4 billion investment. Three new light-rail lines are currently under construction, and two are more in the works, going from 7.5 miles to 39 miles. There are a total of 24 new stations under construction, 10 on the Southeast Line, 5 on the East End Line, 8 on the North line, and 1 on the existing Main Street Line. METRO has a 1 percent sales and use tax imposed within METRO's service area for transit activities. By voter mandate, METRO dedicates 25 percent of its sales tax for the General Mobility Program. Most of this funding is passed on to the city of Houston, Harris County and 14 multi-cities for general mobility projects.	Yes
Reduce fares	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	The City of Houston offers an incentive for downtown municipal employees. The Downtown Employee Parking/Transit policy (AP: 3-6) states that each employee working in downtown is offered a parking space or METRO transit pass.	Yes

TM1.6

**Is your city taking action on improving rail, metro and tram transit times?**

Yes

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**TM1.6a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>	<b>Is this asset owned by the city/another public organization?</b>
Improve rail transit times	Program	Currently in effect [city-wide]	Yes	Lightrail offers more reliability and is an improvement over bus transit times. METRO will also be celebrating its 100 millionth light rail rider in 2013.	Yes

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**TM1.7**

**Is your city taking action on improving rail, metro and tram fuel economy and reducing CO2e?**

Yes

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**TM1.7a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
Improve rail fuel economy and reduce CO2e	Procurement	Still under consideration or awaiting final authorization	Yes	METRO is considering new power contract options, which might increase green power utilization.	Yes

**TM1.8**

**Is your city taking action on improving ferries/river boat infrastructure?**

No

**TM1.8a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
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**TM1.9**

**Is your city taking action on increasing the reach of ferries/river boat services?**

No

**TM1.9a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
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**TM.11**

**Is your city taking action on improving ferries/river boat transit times?**

No

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**TM1.11a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
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**TM1.12**

**Is your city taking action on improving ferries/river boat fuel economy and reducing CO2e emissions?**

No

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**TM1.12a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description	Is this asset owned by the city/another public organization?
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**TM1.13**

Please detail any other actions your city is taking on mass transit transport.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Alternative Transportation Tool				Houston-Galveston Area Council developed the Commute Solutions Viewer to help residents readily identify the alternative forms of transportation available to them. This application can be used to identify the transit routes, stops, and bike paths available at the resident's location. <a href="http://webgis2.h-gac.com/airquality/">http://webgis2.h-gac.com/airquality/</a>

**Page: Transport (Private)**

**TP0.1**

How many kilometers of cycle lanes does the city have?

668

**TP0.2**

What is the total number of private motorized vehicles owned by residents within the city?

3200000

**TP0.3**

**What is the total number of bicycles owned by residents within the city?**

1670000

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**TP0.4**

**What is the total number of taxis registered in the city?**

2480

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**TP0.5**

**How many airports does the city have?**

3

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**TP1.0**

**Is your city taking action on promoting cycling?**

Yes

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**TP1.0a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Cycle hire/share programs	Program	Currently in effect at a significant scale across most of the city	Yes	The City launched its bike share program, Houston Bike Share, in May 2012, which is an active transportation alternative for the City. Houston's initial phase has been successful and, received funding support from Blue Cross Blue Shield TX and the US Department of Energy, totaling nearly \$2 million. On April 3, 2013, Houston B-cycle, expanded from 3 to 21 stations and from 18 to 175 bicycles. This Phase II expansion creates a presence not only in Downtown, but also in the East End, Midtown, Montrose and the Museum District/Hermann Park with four of the stations located at key METRORail stops. Phase III expansion discussions and planning include the Texas Medical Center and local universities, as well as additional neighborhoods. Pollution, traffic, and rising oil costs are just a few of the reasons why Houstonians need options for getting around. <a href="http://www.houston.bcycle.com">www.houston.bcycle.com</a>
School and workplace travel plans	Program	Currently in effect [city-wide]	Yes	The City of Houston offers over 300 miles interconnected bikeway network spanning across 500 square miles. The network includes bike lanes, bike routes, signed-shared lanes and shared-use paths, commonly referred to as 'hike and bike' trails, which includes rails to trails, and other urban multi-use paths. In addition to these bicyclist transportation facilities, there are over 80 miles of hike and bike and nature trails found in City of Houston parks. In addition, Harris County and many municipal utility districts have constructed over 160 miles of bikeways within the City limits.
Cycle training	Program	Currently in effect [city-wide]	Yes	The City of Houston is proud to be a partner with the League of American Bicyclists (LAB) in the development of this online course to represent the classroom portion of the League's Traffic Skills 101 course. The BikeEd program is designed to develop the craft and science of bicycling, the ability to use a bicycle with confidence and competence for pleasure, utility and sport under various roadway, climate and traffic conditions. It is the nation's first free online bicyclist education course. <a href="http://www.bikeed.org/">http://www.bikeed.org/</a> Bike Texas, a statewide non-profit organization, has developed a comprehensive bicycle and pedestrian safety education curriculum designed for four and fifth grade elementary schools. The SafeCyclist Certification Training provides teachers, public safety and youth professionals with bicycle and pedestrian safety interactive lessons and the curriculum needed to teach these life-saving skills to their students. A training session was held in July 2012 at the Houston Permitting Center. There are also programs like the Ready2Roll Cycling series, where participants learn proper riding techniques, safety etiquette, riding in groups, and basic bicycle maintenance.

**Is your city taking action on developing cycle-friendly infrastructure?**

Yes

**TP1.1a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Dedicated cycle lane	Program	Currently in effect at a significant scale across most of the city	Yes	<p>There are 415 miles of paved shared use paths, 84 miles of conventional bike lanes (4 ft or wider), and 1 mile of contraflow bike lane. There are 90 miles of natural surface or unpaved shared use paths and 18 miles of single track (mountain bike trails). In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City’s green space and flooding challenges. There are numerous other benefits associated with utilizing the City’s bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and</li> <li>• Change in Houston’s image to attract the best and brightest to the city.</li> </ul>
Shared cycle lane	Program	Currently in effect at a significant scale	Yes	<p>There are 16 miles of shared lane markings on Washington Avenue and Navigation Blvd, Antoine, Brittmore, and West Dallas.</p>



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
		across most of the city		
Cycle signage	Program	Currently in effect at a significant scale across most of the city	Yes	There are 164 miles of signed bike routes.
Cycle parking	Policy / Regulation	Currently in effect and being piloted	Yes	There is no existing data, but the Planning Department will be tracking new bike parking going forward as new projects get permitted. The department will work with GIS staff to consider ways to present the data. Also, the City and cycling advocacy group, Bike Houston, are evaluating how to document existing bicycle parking locations.
Cycle priority at traffic lights	Program	Currently in effect and being piloted	Yes	There is a pilot project at the intersection of Sawyer and Spring. When a cyclist activates the signal, the cyclist gets a 7-second advanced signal before vehicle traffic.
Cycle redistribution systems				Not applicable

## TP1.2

**Is your city taking action on promoting walking?**

Yes

## TP1.2a

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Walking maps and signage	Program	Still under consideration or awaiting final authorization	Yes	<p>City Mobility Planning is a joint initiative between the departments of Planning &amp; Development and Public Works &amp; Engineering (PWE) in partnership with the Houston-Galveston Area Council the regions Metropolitan Planning Organization (MPO). The City of Houston is trying to get ahead of transportation challenges. The Houston Planning Commission has established several committees to examine a range of development and growth issues. One of the committees, the General Plan committee, established mobility and drainage as top priorities and recommended a programmatic framework to address these issues. City Mobility Planning (CMP) will be the framework for evaluating transportation issues in the city and extra-territorial Jurisdiction (ETJ). Part of the study looked at ways to improve intersections and access to trail networks.</p> <p><a href="http://www.houstontx.gov/planning/DevelopRegs/mobility/CMP.html">http://www.houstontx.gov/planning/DevelopRegs/mobility/CMP.html</a> In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. This project will incorporate pedestrian signage.</p>
Pedestrian plazas	Program	Currently in effect and being piloted	Yes	<p>In the 2008-2011 TIP, the Transportation Policy Council committed \$1.5 million to fund Livable Center studies in the region. The goal of the Houston-Galveston Area Council's Livable Centers Program is to help create walkable, mixed-use places that provide multi-modal transportation options, improve environmental quality, and promote economic development. Many of the studies include proposals for pedestrian plazas and other pedestrian recommendations. <a href="http://www.h-gac.com/community/livablecenters/planningstudies/current/default.aspx">http://www.h-gac.com/community/livablecenters/planningstudies/current/default.aspx</a></p>
Improve pedestrian crossings	Policy / Regulation	Currently in effect [city-wide]	Yes	<p>Chapter 42 relating to the City's land development ordinance provides guidelines on appropriate sidewalk widths and encourages connectivity.</p> <p><a href="http://www.houstontx.gov/planning/DevelopRegs/dev_regs_links.html">http://www.houstontx.gov/planning/DevelopRegs/dev_regs_links.html</a> In the City's Infrastructure Design Manual, Appendix 2 presents a "Street Design Menu" with examples of optional roadway corridor sections that are a result of the 2009 City of Houston Mobility Planning Study. The recommended street cross sections show a multi-modal approach to street design and offer improved pedestrian crossings. <a href="http://documents.publicworks.houstontx.gov/documents/design_manuals/idm.pdf">http://documents.publicworks.houstontx.gov/documents/design_manuals/idm.pdf</a></p>

**Is your city taking action on transportation demand management?**

Yes

**TP1.3a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Road tolls	Program	Currently in effect [city-wide]	Yes	The Harris County Toll Road Authority system consists of approximately 120 miles of roadway in the Houston / Harris County area and 12 miles in Ft. Bend County, for a total of 132 miles. The Westpark Tollway, Katy Managed Lanes and the Northeast section of the Sam Houston Tollway are all-electronic tolling. All-electronic tolling means there are no toll booths, and no cash payment is accepted. An EZ TAG or other interoperable Texas toll payment tag is required. "Managed lanes" refers to a mixed-use facility dedicated to mass transit, high occupancy vehicles (HOV), and also allows for tolling. In this case, METRO vehicles are granted free usage 24-hours a day, and HOVs are granted free usage in both directions of travel during peak times-Monday through Friday, 5am - 11am and 2pm - 8pm. Single occupancy vehicles (SOV) are allowed to use the lanes 24 hours a day for a toll, which will be charged electronically via an EZ TAG or other interoperable Texas toll payment tag. During HOV hours, drivers will need to choose their designated lane based on the occupancy of their vehicle. Rates are posted on message boards at all entrances. The lanes serve as an all-electronic tollway for all vehicles (except mass transit) during all other times. In order to maintain an optimum level of service on the facility at all times, toll rates for the managed lanes are based on time of day, vehicle occupancy and axle count. <a href="https://www.hctrta.org/tollroads/">https://www.hctrta.org/tollroads/</a>
Congestion/pollution charging			Yes	METRO HOT (High Occupancy Toll) Lanes allow drivers without passengers (single-occupant vehicles or SOVs) to use the HOV (High Occupancy Vehicle) Lane – for a toll. Traffic monitoring systems help METRO maintain traffic speeds to ensure optimal travel times for existing HOV Lane users, as well those using the METRO HOT Lanes. If speeds

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				slow, single-occupant vehicles are not allowed in the HOV Lane. The lane is also be closed during peak traffic periods – specific to each METRO HOT Lane corridor - to single-occupant vehicles. METRO HOT Lanes benefits: -Provides new options for commuters - Increases safety and promotes quick response to accidents and issues in the lanes, thanks to additional camera monitoring -Improves air quality by reducing traffic congestion -Better utilizes existing HOV Lanes -Offers increased enforcement of the HOV Lane system -Revenue generated from tolls will contribute to the operation, maintenance and enforcement costs for METRO HOT Lanes. Tolls are based on time of day and the congestion level of each METRO HOT Lane. METRO will publish the toll rate for specific corridors prior to opening, and tolls will be prominently displayed along each corridor. <a href="http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx">http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx</a>
Time/day restrictions on personal vehicle usage				Not applicable
Restrict parking	Program	Still under consideration or awaiting final authorization	Yes	Public Works & Engineering restricts parking based on times and location. Where expected traffic volumes are greatest, permanent parking is not allowed; however, some on-street parking is allowed where non-peak hour volumes allow for it. The City's Administration & Regulatory Affairs is in charge of providing fees and managing meters.
School and workplace walking travel plans	Program	Currently in effect [city-wide]	Yes	Biking and walking are fun, healthy commute alternatives that energize individuals and employees while reducing traffic congestion and air pollution. Houston-Galveston Area Council Commute Solutions encourages these two alternatives by providing rewards for bicycle and pedestrian commuting trips ( <a href="http://www.nuride.com">www.nuride.com</a> ), trail maps. <a href="http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx">http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx</a>
Increase vehicle registration fees etc.	Policy / Regulation	Still under consideration or awaiting final authorization	No	The Houston-Galveston Area Council have made efforts at increasing fuel tax and insurance.
Car sharing/car clubs	Program	Currently in effect [city-wide]	Yes	NuRide is the nation's largest rewards program for individuals who utilize commute alternatives by carpooling, vanpooling, biking, walking, telecommuting and taking public transportation. NuRide is a free service that can match carpoolers who live and work near each other as well as provide rewards and special offers to all NuRide members who track trips. NuRide is supported by the Houston-Galveston Area Council and local and national sponsors.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Personalized walking travel planning	Program	Currently in effect [city-wide]	Yes	<p>The Houston-Galveston Area Council Pedestrian-Bicyclist Program coordinates programs and projects that improve mobility and safety for pedestrians and bicyclists throughout the region. The Regional Bikeway Viewer is an interactive map of existing and planned bikeways in the Houston-Galveston region. Users can see the regional bikeway network in its entirety, or zoom in for a closer look at specific areas of interest. The City of Houston's Bikeway Program designs, constructs, and maintains of a citywide network of bicycle routes integrated into an overall transportation network for the Houston area. The program offers more than 300 miles of interconnected bikeway network spanning across 500 square miles. The bikeway network consists of off-road hike and bike trails, on-street bike lanes and on-street bike routes. The Houston Bikeway Network Map includes more than 300 miles of the most current on-street and off-street facilities as well as trails.</p> <p><a href="http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx">http://www.mysolutionis.com/residents/commuter-services/biking-and-walking.aspx</a></p>

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**TP1.4**

**Is your city taking action on improving personal motor vehicle fuel economy and reduce CO2e?**

Yes

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**TP1.4a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Switch to electric vehicles	Program	Currently in effect [city-wide]	Yes	<p>The city uses its Houston Drives Electric initiative to educate the public about electric vehicles and has partnered with eVgo's in their EVs for Trees campaign to encourage citizens to test drive electric vehicles. <a href="http://www.greenhoustontx.gov/ev/">http://www.greenhoustontx.gov/ev/</a> The City is a partner in the Center for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October 2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outlines the number of existing PEVs and equipment in the Houston region.</p> <p><a href="http://www.electrictechnologycenter.com/pdf/Volume%201%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf">http://www.electrictechnologycenter.com/pdf/Volume%201%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf</a></p> <p><a href="http://www.electrictechnologycenter.com/pdf/Volume%202%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf">http://www.electrictechnologycenter.com/pdf/Volume%202%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf</a></p> <p><a href="http://www.electrictechnologycenter.com/pdf/Volume%203%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf">http://www.electrictechnologycenter.com/pdf/Volume%203%20CCET%20-%20Texas%20Triangle%20Plan%20Oct%202012.pdf</a> The City has also streamlined the EVSE permitting process for residential installations.</p>
Switch to hybrid engines	Program	Currently in effect at a significant scale across most of the city	Yes	<p>The City has the 4th largest municipal hybrid fleet in the nation. Approximately 50 percent of the City's nonspecialty, light-duty fleet have been replaced with hybrid vehicles. The City also has 25 Nissan Leafs in its fleet and 15 plug-in hybrids.</p>
Switch to other lower-carbon fuel	Program	Currently in effect and being piloted	Yes	<p>Houston Biodiesel educates about and promotes the use of clean, renewable, non-toxic, non-flammable, and domestically produced biodiesel.</p>
Registration fees tied to vehicle efficiency				<p>Not applicable</p>
Electric vehicle charging infrastructure	Program	Currently in effect at a significant scale across most of the city	Yes	<p>Participation in the DOE's EV Project added around 100 more Ecotality's Blink charging stations in Houston, including 39 at the airports and 29 in downtown Houston. Through this program, participants, including the City of Houston and other businesses, received charging stations at no cost and an additional credit to install the charging station. The EV Project goal is to collect and analyze data to characterize vehicle use in diverse topographic and climatic conditions, evaluate the effectiveness of charge infrastructure, and conduct trials of various revenue systems for commercial and public charge infrastructures. The Houston Drives Electric website updates its charging station map periodically to</p>

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				show where public EV charging is available. The City is a partner in the Center for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October 2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outline the number of existing PEVs and equipment in the Houston region. Links to Volume 1-3 of the plan are included. The City also released guidelines and long range plans to guide electric vehicle charging station deployment. (Link to attachments included) -Electric Vehicle Deployment Guidelines -Long Range Electric Vehicle plan -Micro-Climate plan The City has also streamlined the EVSE permitting process for residential installations. <a href="http://www.greenhoustontx.gov/ev/">http://www.greenhoustontx.gov/ev/</a>

**TP1.5**

**Is your city taking action on improving the efficiency of truck freight ?**

No

**TP1.5a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description

TP1.6

Is your city taking action on improving truck fuel economy and reduce CO2e?

Yes

TP1.6a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Switch to electric vehicles	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Two key components to cleaning up the air and meeting the federal air quality standards in the region are Clean Cities, a technical advisory and outreach program, and Clean Vehicles, a funding program housed at the Houston-Galveston Area Council's Transportation Department. Both programs support local, state, federal and private entities in efforts to clean up the air through information and funding for alternative fuels and infrastructure as well as clean diesel technologies. <a href="http://www.mysolutionis.com/fleet-management/default.aspx">http://www.mysolutionis.com/fleet-management/default.aspx</a>
Switch to hybrid engines	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Two key components to cleaning up the air and meeting the federal air quality standards in the region are Clean Cities, a technical advisory and outreach program, and Clean Vehicles, a funding program housed at the Houston-Galveston Area Council's Transportation Department. Both programs support local, state, federal and private entities in efforts to clean up the air through information and funding for alternative fuels and infrastructure as well as clean diesel technologies. <a href="http://www.mysolutionis.com/fleet-management/default.aspx">http://www.mysolutionis.com/fleet-management/default.aspx</a>
Switch to other lower-carbon fuel	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Two key components to cleaning up the air and meeting the federal air quality standards in the region are Clean Cities, a technical advisory and outreach program, and Clean Vehicles, a funding program housed at the Houston-Galveston Area Council's Transportation Department. Both programs support local, state, federal and private entities in efforts to clean up the air through information and funding for alternative fuels and infrastructure as well as clean diesel technologies. <a href="http://www.mysolutionis.com/fleet-">http://www.mysolutionis.com/fleet-</a>



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				management/default.aspx
Registration fees tied to vehicle efficiency				Not applicable

**TP1.7**

**Is your city taking action on improving the operations of shipping ports?**

Yes

**TP1.7a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Fuel switching	Policy / Regulation	Currently in effect [city-wide]	Yes	Emission controls are regulated by the Environmental Protection Agency. All ships have to fuel switch within 200 nautical miles of the coast of the US per federal regulations. On March 26, 2010, the International Maritime Organization (IMO) officially designated waters off North

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				American coasts as an area in which stringent international emission standards will apply to ships. For this area, the effective date of the first-phase fuel sulfur standard is 2012, and the second phase begins in 2015. Beginning in 2016, NOx aftertreatment requirements become applicable. <a href="http://www.epa.gov/otaq/regs/nonroad/marine/ci/420f10015.pdf">http://www.epa.gov/otaq/regs/nonroad/marine/ci/420f10015.pdf</a>
More efficient vehicles	Incentive / Disincentive	Currently in effect [city-wide]	Yes	The Port of Houston Authority has specific programs being developed to enhance the turnover of vehicles to be more efficient.
Fuel switching	Program	Currently in effect and being piloted	Yes	Pilot projects for alternative fuel vehicles.
Hoteling/port electrification	Program	Still under consideration or awaiting final authorization	Yes	The infrastructure is available for port electrification at the Bayport Terminal.
Labeling programs	Policy / Regulation	Currently in effect [city-wide]	Yes	Any product or good that crosses the docks of the Port of Houston must be labeled. Gaseous or liquids must be labeled, and Material Safety Data Sheets must be on the container or drum. At the Port of Houston Authority, anti-idling is currently an incentive/disincentive that will turn into a policy by the end of 2013. Developed by the Regional Air Quality Planning Committee, there is a 5-minute idling limit currently in place; however, enforcement is being developed. Signage is in place to inform port users of the idling limit.

**TP1.8**

**Is your city taking action on improving the city authority fleet vehicle efficiency?**

Yes

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**TP1.8a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Switch vehicles to electric	Procurement	Currently in effect and being piloted	Yes	The City is planning to purchase two more Nissan Leafs in 2013 and will continue to purchase the Toyota Prius to expand its hybrid fleet. The Fleet director is also planning to add several Chevrolet Volts to the motor pool in 2014. This will give the City an electric vehicle that has a motor that will not limit range for the user, and most trips in the motor pool average about 16 miles, which is within the Volt's 35-mile EV range. The City also started Houston Fleet Share in August 2012. Through this program, 50 city-owned fleet vehicles – including 25 Nissan Leaf EVs and other plug-in electric and hybrid vehicles – were outfitted with Zipcar's proprietary car sharing technology for use by city employees across numerous departments. This program is the first of its kind to utilize electric vehicles. Funded by the State Energy Conservation Office American Recovery and Reinvestment Act (SECO-ARRA) Transportation Program (SEP), the program is designed to help the City of Houston improve efficiency, promote sustainability and save money - all without sacrificing employee mobility.

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**TP1.9**

Is your city taking action on improving taxis / motorized rickshaw fuel economy and reduce CO2e?

No

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**TP1.9a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**TP1.11**

**Is your city taking action on increasing sharing of taxis / motorized rickshaw?**

No

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**TP1.11a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**TP1.12**

**Is your city taking action on reducing emissions from aviation?**

Yes

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**TP1.12a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Reduce emissions from ground operations	Policy / Regulation	Currently in effect [city-wide]	Yes	Continental Airlines and Southwest Airlines have reduced NOx emissions from ground service equipment (GSE) by 75%. NOx Reduction: 1.150 TPD
Reduce emissions from flights	Program	Currently in effect [city-wide]		Winglets reduce noise by 6.5 %, reduced fuel consumption by 6% and lower NOx emissions by 5%.
Towing airplanes to runways				Not applicable
Mandatory continuous descent approach	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	The Federal Aviation Administration anticipates implementation late 2013/ early 2014 which will result in a reduction in both jet fuel consumption and associated emissions

#### TP1.13

Please detail any other actions your city is taking on private transport.

Action	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Real-time Traffic Monitoring	Program	Currently in effect [city-wide]	Yes	Houston TranStar is a partnership of four government agencies that are responsible for providing Transportation Management and Emergency Management services to the Greater Houston Region. Houston TranStar, a national leader in freeway incident management, uses state-of-the-art technologies to reduce congestion on major roadways. Monitoring traffic incidents with more than 730 regional Closed Circuit Television Cameras (CCTVs), staff at the TranStar center dispatch vehicles to remove debris or hazardous materials, communicate with emergency vehicles about the most direct routes to an accident scene, and send tow trucks to stalled vehicles.

Action	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				Dynamic Message Signs (DMS), deployed from Houston TranStar, inform travelers about expected travel times and traffic issues ahead. Synchronized traffic signals, speed sensors, Highway Advisory Radio, ramp meters and other devices also help keep the region's traffic moving. Houston TranStar was the first center in the nation to combine Transportation and Emergency Management centers, and the first to bring four agencies together under one roof. Houston TranStar's web site, nationally and locally recognized for the breadth of information it offers the general public, allows subscribers to receive personalized travel time updates and incident warnings, as well as providing up-to-the-minute traffic and weather information. <a href="http://www.houstontranstar.org/">http://www.houstontranstar.org/</a>
Houston Fleet Share	Program	Currently in effect and being piloted	Yes	The City started Houston Fleet Share in August 2012. Through this program, 50 city-owned fleet vehicles – including 25 Nissan Leaf EVs and other plug-in electric and hybrid vehicles – were outfitted with Zipcar's proprietary car sharing technology for use by city employees across numerous departments. This program is the first of its kind to utilize electric vehicles. Funded by the State Energy Conservation Office American Recovery and Reinvestment Act (SECO-ARRA) Transportation Program (SEP), the program is designed to help the City of Houston improve efficiency, promote sustainability and save money - all without sacrificing employee mobility.
Expanding Hike and Bike Trails	Program	Currently in effect at a significant scale across most of the city	Yes	Also, in November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation: <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation;</li> <li>and • Change in Houston's image to attract the best and brightest to our city.</li> </ul> <a href="http://www.houstonparksboard.org/projects/bayou_greenways_initiative.php">http://www.houstonparksboard.org/projects/bayou_greenways_initiative.php</a>
Anti-Idling Policies	Policy /	Currently in	Yes	The City of Houston, Houston Independent School District, and METRO have anti-idling policies.

Action	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
	Regulation	effect at a significant scale across most of the city		
Runway/Taxiway Improvements	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	Airfield runways, taxiways, and gates/ramp improvements provided for improved air quality by reducing aircraft taxi and idle times which resulted in both fuel consumption and associated emissions.
Reduced Use of Auxiliary Power Units (APUs) at Airports	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	Auxiliary power units (APUs) are small on-board turbines that are operated to provide electrical power and air conditioning to an aircraft when it is parked at a gate and the main engines are shut down. Installation of gate electrification equipment enables parked aircraft to forego the use of APUs which results in a reduction in both jet-fuel consumption and associated emissions.
Consolidated Rental Car Facility at Airports	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	Rental car companies operated out of separate facilities located both on airport and off-airport. Houston Airport System constructed a Consolidated Rental Car Facility on airport property south of the terminal area. Significantly reducing the mix of numbers, types, and ages of the existing buses operated by the various rental car companies which resulted in a reduction in both diesel fuel consumption and associated emissions.

**Page: Existing Buildings**

**B0.1**

**What is the average breakdown of energy use in buildings across the city? Please indicate the percentage by end use.**

Energy Use	Percentage
Space conditioning	39%
Refrigerating	8%
Lighting	31%
Hot water	10%
Plug loads	12%

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**B1.0**

**Is your city taking action on energy efficiency / retrofit of public housing?**

No

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**B1.0a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.1**

**Is your city taking action on performance rating and reporting for public housing?**

No

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**B1.1a**



Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.2**

**Is your city taking action on renewable / low carbon on-site energy generation in public housing?**

No

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**B1.2a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.3**

**Is your city taking action on switching to lower-carbon fuels for public housing?**

No

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**B1.3a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.4**

**Is your city taking action on energy efficiency / retrofit of private housing?**

Yes

**B1.4a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Insulation	Policy / Regulation	Currently in effect [city-wide]	Yes	Beginning February 1, 2013, the City of Houston Energy Code for residential structures requires that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Installation of efficient lighting systems	Policy / Regulation	Currently in effect [city-wide]	Yes	Beginning February 1, 2013, the City of Houston Energy Code for residential structures requires that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
HVAC operations & maintenance	Policy / Regulation	Currently in effect [city-wide]	Yes	Beginning February 1, 2013, the City of Houston Energy Code for residential structures requires that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. The City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Energy efficient appliance purchases				Not applicable
Pay back schemes (utility adjusted billing)				Not applicable
Revolving EE loans				Not applicable
Long term property tax based loans				Not applicable
Tax incentives				Not applicable

**B1.5**

**Is your city taking action on performance rating and reporting for private housing?**

Yes

**B1.5a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Benchmarking	Policy / Regulation	Currently in effect [city-wide]	Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at no charge. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with \$3 million committed in 2013.
Energy performance certification	Program		Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at no charge. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with \$3 million committed in 2013.
Sub metering				Not applicable
Net metering	Program	Currently in effect and being piloted	Yes	Some retail electric providers, like Green Mountain Energy, offer credits to customers for any excess energy that their qualifying distributed renewable generation facility exports to the electricity grid.
Smart meters	Policy / Regulation	Currently in effect [city-wide]	Yes	Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Audits and Advice	Program		Yes	The Residential Energy Efficiency Program (REEP) provides income-qualified Houstonians the opportunity to receive weatherization measures in their homes at no charge. The efficiency upgrades were based on a custom assessment of each home that determined the measures needed to make the home more energy efficient. The City has helped 13,000 Houstonians to date, spending \$30 million (DOE grant funded). The City is now working with CenterPoint Energy to continue this successful program, with \$3 million committed in 2013.

**Is your city taking action on renewable / low carbon on-site energy generation for private housing?**

Yes

**B1.6a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Solar electricity	Policy / Regulation	Currently in effect and being piloted	Yes	The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes. On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with the Houston Advanced Research Center on streamlining and refining the solar permitting process. The City is also keeping track of legislation relating to solar, supporting bills such as PACE (Property Assessed Clean Energy) financing that help property owners break down the financial barriers to installing renewable energy projects. The City has explored potential ideas that would keep the market moving forward, including ICLEI's Solar Benefit program. This idea would reduce the complexity and cost of residential solar through a collective group discount program. The program would reach the residential sector via targeted outreach through employer organizations in Houston. The City of Houston is considering offering this solar program to City staff. NRG Energy has a Residential Solar Solutions-Solar Leasing program: <a href="http://www.nrgsolar.com/#welcome">http://www.nrgsolar.com/#welcome</a>
Micro wind				Not applicable
Combined heat and power	Program	Currently in effect and being piloted	Yes	HOUZE® Advanced Building Science Inc., along with the City of Houston, debuted the first-of-its-kind zero-energy homes in the United States, in the community of Independence Heights, just north of downtown Houston. These homes introduce a new, affordable option for buyers by producing more energy than they consume, redefining the American Dream with homes that cost less to own, operate and maintain. HOUZE® (the "ZE" stands for Zero Energy) Advanced Building Science Inc. is an

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				innovative, technology commercialization company integrating disruptive technologies into real estate development and building. The company's mission is to empower the building industry with next generation building systems, materials and technologies to create affordable net-zero energy homes and buildings. It is 100% powered by natural gas and power cell. <a href="http://thezeroenergyhome.com/">http://thezeroenergyhome.com/</a>
Solar heating / hot water				Not applicable
Biomass heating				Not applicable
Geothermal heating supply				Not applicable
Heat pumps				Not applicable
Fuel Cells				Not applicable

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**B1.7**

**Is your city taking action on switching to lower-carbon fuels in private housing?**

Yes

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**B1.7a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Switching from coal/wood fire to electricity				Not applicable
Switching from heating oil to natural gas				Not applicable
Switching from residual fuel oil to distillate fuel oil				Not applicable
Switching to biogenic heating fuels				Not applicable
Purchase of 'green' electricity from the grid	Program	Currently in effect at a significant scale across most of the city	Yes	Retail electric providers that offer green power include: Reliant (NRG), Green Mountain (NRG), TXU, Gexa, and Stream.

**B1.8**

**Is your city taking action on energy efficiency / retrofit of municipal (non-housing) buildings?**

Yes

**B1.8a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Heating and cooling efficiency	Program	Currently in effect [city-wide]	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 20 LEED Certified projects with 8 projects under review or in the pipeline. In the City's municipal energy efficiency program, over 100 City facilities, 6 million square feet, are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.
Insulation	Program	Currently in effect [city-wide]	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 20 LEED Certified projects with 8 projects under review or in the pipeline. In the City's municipal energy efficiency program, over 100 City facilities, 6 million square feet, are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.
Installation of CFL or other efficient lighting mechanisms	Program	Currently in effect [city-wide]	Yes	The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. The City of Houston has 20 LEED Certified projects with 8 projects under review or in the pipeline. In the City's municipal energy efficiency program, over 100 City facilities, 6 million square feet, are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA's Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Building energy management system	Program	Currently in effect and being piloted	Yes	With the assistance of the EECBG funding the City is able to implement a high-tech energy management solution at City Hall, the City Hall Annex and the City Administration Building. The Smarte Building system will measure and analyze real-time energy consumption throughout each of the buildings. The system is designed to measure energy use for specific equipment and in many cases at an individual user level. The system will allow plant managers to tune their building automation system, as well as allow individual building occupants to more energy efficiently use their computers, peripherals and other office equipment.
Energy Performance Contracting	Program	Currently in effect [city-wide]	Yes	Through performance contracting, a total of 297 City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years. Both Siemens and Schneider Electric worked on the performance contracting.
Revolving EE loans				Not applicable
PACE (long term property tax based loans)	Program	Still under consideration or awaiting final authorization	Yes	The City has been supporting a PACE bill in the Texas legislative session and would consider establishing a commercial PACE program.
Tax incentives	Program	Currently in effect at a significant scale across most of the city	Yes	In September 2009, Houston enacted Ordinance No. 2009-858, the City of Houston Tax Abatement Program, which establishes a partial tax abatement for commercial buildings that meet LEED standards. A revised standard was passed in December 2011 extending the tax abatement program until December 14, 2013. In order to qualify for the abatement, applicants must register with the US Green Building Council and then submit an application for the abatement prior to beginning any construction on the project. The tax abatement benefit will not become affective until construction of the project has completed and LEED certification is obtained. In addition, projects must meet a minimum investment level for the incremental cost of obtaining the LEED certification.

**Is your city taking action on performance rating and reporting of municipal (non-housing) buildings?**

Yes

**B1.9a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Benchmarking	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	The City of Houston has voluntary benchmarking programs, like the Houston Green Office Challenge and the DOE's Better Buildings Challenge, where commercial buildings can opt into disclosing their energy ratings to the City. The City is considering an energy benchmarking, audit, and disclosure policy for commercial buildings.
Energy performance certification	Program	Still under consideration or awaiting final authorization	Yes	The City is currently working on benchmarking over 300 City buildings in hopes of achieving Energy Star certification on as many as possible. The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space.
Sub metering	Program	Currently in effect and being piloted	Yes	With the assistance of the EECBG funding the City is able to implement a high-tech energy management solution at City Hall, the City Hall Annex and the City Administration Building. The Smarte Building system will measure and analyze real-time energy consumption throughout each of the buildings. The system is designed to measure energy use for specific equipment and in many cases at an individual user level. The system will allow plant managers to tune their building automation system, as well as allow individual building occupants to more energy efficiently use their computers, peripherals and other office equipment.
Net metering	Program	Currently in effect and being piloted	Yes	The City of Houston constantly strives to keep solar at the forefront of its sustainability vision, striking a balance between increasing market growth and decreasing regulatory barriers. With existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center, the City is a test bed for solar technologies. The Green Building Resource Center provides

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				leadership and education and shows real-time energy production of its rooftop solar panels. The center provides valuable resources to better inform the public when they are ready for solar, and citizens are able to learn what system works best in Houston's climate and location.
Smart meters	Program	Currently in effect at a significant scale across most of the city	Yes	Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Audits and Advice	Program	Currently in effect at a significant scale across most of the city	Yes	Through performance contracting, a total of 297 City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years.

**B1.11**

**Is your city taking action on switching to lower-carbon fuels for municipal (non-housing) buildings?**

Yes

**B1.11a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Switching from coal/wood fire to electricity				Not applicable
Switching from heating oil to natural gas				Not applicable
Switching from residual fuel oil to distillate fuel oil				Not applicable
Switching to biogenic heating fuels				Not applicable
Purchase of 'green' electricity from the grid	Program	Currently in effect [city-wide]	Yes	The City is a leader in purchasing renewable energy credits. It is the largest purchaser of renewable energy in the U.S. Currently, green power accounts for 35% of the City's electricity usage with a goal of achieving 50% in 2013. The City's commitment to green power is setting an example for homeowners and businesses in Houston.

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**B1.12**

**Is your city taking action on energy efficiency / retrofit of commercial buildings?**

Yes

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**B1.12a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Heating and cooling efficiency	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Insulation	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
CFL or other efficient lighting mechanisms	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Daylighting	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Building energy management system	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Energy Performance Contracting	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	The Energy Efficiency Incentive Program (EEIP) provides a financial incentive to help office building owners, property managers and tenants located in the City of Houston to reduce energy consumption and increase the economic performance of their building. The Houston Green Office Challenge provided education on energy performance contracting and helping building owners/property managers find resources to help fund energy efficiency retrofits.
Pay back schemes (utility adjusted billing)				Not applicable
Revolving EE loans				Not applicable
Long term property tax based loans				Not applicable
Other innovative financial				Not applicable

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
mechanisms				
Tax incentives	Program	Currently in effect [city-wide]	Yes	In September 2009, Houston enacted Ordinance No. 2009-858, the City of Houston Tax Abatement Program, which establishes a partial tax abatement for commercial buildings that meet LEED standards. A revised standard was passed in December 2011 extending the tax abatement program until December 14, 2013. In order to qualify for the abatement, applicants must register with the US Green Building Council and then submit an application for the abatement prior to beginning any construction on the project. The tax abatement benefit will not become affective until construction of the project has completed and LEED certification is obtained. In addition, projects must meet a minimum investment level for the incremental cost of obtaining the LEED certification.

**B1.13**

**Is your city taking action on performance rating and reporting for commercial buildings?**

Yes

**B1.13a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Benchmarking	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	The City of Houston has voluntary benchmarking programs, like the Houston Green Office Challenge and the DOE's Better Buildings Challenge, where commercial buildings can opt into disclosing their energy ratings to the City. The City is considering an energy benchmarking, audit, and disclosure policy for commercial buildings.
Energy performance certification	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	The City is considering energy benchmarking, audit, and disclosure policies for commercial buildings.
Sub metering				Not applicable
Net metering				Not applicable
Smart meters				Over 2.2 million smart meters have been installed across Houston, allowing consumers to see their yearly, monthly or daily electricity use down to 15-minute increments at SmartMeterTexas.com, get near-real time usage or bill forecasts on an In-Home Display energy monitor, and benefit from new retail electric products and services such as pre-paid service, time-of-use rates, and energy analysis tools.
Audits and Advice	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	The City is considering energy benchmarking, audit, and disclosure policies for commercial buildings.

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**B1.14**

**Is your city taking action on renewable / low carbon on-site energy generation for commercial buildings?**

No

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**B1.14a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.15**

**Is your city taking action on switching to lower-carbon fuels in commercial buildings?**

No

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**B1.15a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.16**

**Is your city taking action on energy efficiency / retrofit of industrial buildings?**

No

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**B1.16**



Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.17**

**Is your city taking action on performance rating and reporting for industrial buildings?**

No

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**B1.17a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.18**

**Is your city taking action on measures to reduce carbon emissions from industry?**

No

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**B1.18a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.19**

**Is your city taking action on switching to lower-carbon fuels in industry?**

No

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**B1.19a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**B1.21**

**Please detail any other actions your city is taking on existing buildings.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Energy Efficiency and Historic Preservation	Program	Currently in effect and being piloted	Yes	The Houston District Council of the Urban Land Institute (ULI) awarded two City of Houston projects its prestigious 2013 Development of Distinction Award. The Julia Ideson Building, City of Houston - Public Library and Parks Department Headquarters, City of Houston Parks Department tied for the honors in the Heritage Award category. This is a testament to the City's commitment to leading the charge on combining historic preservation and green building practices. Another notable building that coupled preservation and green building is the Houston Permitting Center, which is LEED Gold facility (video link included).
Schools LEED Commitment	Program	Currently in effect [city-wide]	Yes	Houston Independent School District has committed to building all of its new facilities to LEED (Leadership in Energy and Environment Design) standards, which were developed by the U.S. Green Building Council to provide builders a framework and standards for green building. The district has made the same commitment for all new schools that will be built under the 2012 bond program.
Municipal Energy Efficiency Policy	Policy / Regulation	Currently in effect and being piloted	Yes	Under Administrative Procedure 7-1 City Energy Efficiency Policy, Section 7.2.7 Equipment Purchasing specifies that all equipment, appliance and computer purchases should be Energy Star rated, when possible. <a href="http://www.houstontx.gov/adminpolicies/7-1.pdf">http://www.houstontx.gov/adminpolicies/7-1.pdf</a>
LEED Stadium facilities	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	Stadiums and cultural facilities are required to adhere to the City's energy codes and is required to follow the Green Building Resolution if it is a City-funded project. BBVA Compass Stadium, where the Houston Dynamos soccer team plays, is the first new construction LEED® Silver sports facility in the city of Houston. In 2010 the Toyota Center became the first professional sports facility in Texas to achieve LEED certification.
Green Office Challenge	Program	Currently in effect at a significant scale across most of the city	Yes	The City launched the Houston Green Office Challenge, which provides training and resources to help office building owners, property managers, management districts and tenants reduce energy consumption, waste generation and water use. In the first year, Green Office Challenge participants collectively reduced energy usage by 28 million kilowatt hours, reduced water usage by 74 million gallons, and more than 90 percent recycled in the office, diverting 40 percent of waste from the landfill. <a href="http://www.houstongoc.org">www.houstongoc.org</a> .
Properties Listing Green Features	Program	Currently in effect [city-wide]	Yes	The Houston Association of Realtors has added the option of "Energy Features" and "Green Certifications" to its search function. The Green Resource Council includes a list of what falls under "Energy Feature" and "Green Certification."

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**A0.1**

**Describe the stability of the city's electricity supply**

<b>Electricity Metrics</b>	<b>Answer</b>
Number of power outages within the city during 12 month period	2
Total duration of power outages within the city during 12 month period (in minutes)	157
Number of customers affected by power outages within the city during 12 month period	100000

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**A0.2**

**Has the city allocated funds towards climate adaptation measures?**

Yes

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**A0.3**

**Has the city secured external funding to allocate towards climate adaptation measures?**

Yes

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**A0.4**

**Are there staff members within the city with a role specifically responsible for climate change adaptation?**

No

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**A0.5**

**Has the city undertaken vulnerability and risk assessment in relation to:**

Risk category	Answer
Heat stress	Yes
Water stress	Yes
Flood risk	Yes
Extreme weather	Yes
Agriculture / habitat changes	Yes
Other	Yes

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**A0.6**

**What is the water stress index for the city?**

65

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**A0.7**

**Is the city coastal?**

Yes

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**A0.8**

**Is the city located close to a water body (e.g. river, lake)?**

Yes

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**A0.9**

**Please identify key targets that have been specified in relation to climate adaptation.**

Climate adaptation targets include reducing urban heat island effect, increasing water conservation measures, increased preparedness for hurricane events, reducing flooding risk, and heat emergency planning.

**A1.0**

**Is your city taking action on climate adaptation planning and preparation?**

Yes

**A1.0a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Crisis management strategies	Program	Currently in effect [city-wide]	Yes	The City of Houston activates Heat Emergency Plan and opens cooling centers (e.g. city libraries, multi-service centers, and park and recreation centers) to citizens without access to air conditioning during heat waves.
Early warning systems	Program	Currently in effect [city-wide]	Yes	The Harris County Flood Control District's Flood Warning System measures rainfall amounts and monitors water levels in bayous and major streams on a real-time basis to inform Houstonians of dangerous weather conditions. The system relies on 133 gage stations strategically placed throughout Harris County bayous and their tributaries. The stations contain sensors that transmit valuable data during times of heavy rainfall and during tropical storms and hurricanes. Some gages also measure wind speed and direction, barometric pressure, air temperature, road temperature and humidity. <a href="http://www.harriscountyfws.org/">http://www.harriscountyfws.org/</a>
Flood mapping (and associated mapping) at neighborhood or district level	Program	Currently in effect [city-wide]	Yes	The Harris County Flood Control District's Flood Warning System measures rainfall amounts and monitors water levels in bayous and major streams on a real-time basis to inform Houstonians of dangerous weather conditions. The primary function of the Flood Warning System is to transmit rainfall and bayou/stream level data for use by Houstonians and by government officials in taking steps to protect the public. The information received is collected and analyzed by the Flood Control District also to develop post-flood reports. These reports detail the extent and impact of flooding, including an approximation of the number of structures inundated from a flood. In addition, the Flood Control District uses this information to perform engineering analyses for identifying locations of future projects as well as to determine the effectiveness of constructed projects. <a href="http://www.harriscountyfws.org/About">http://www.harriscountyfws.org/About</a>
Heat mapping/thermal	Program	Currently in effect [city-wide]	Yes	The Houston Advanced Research Center has conducted heat mapping in conjunction with their urban heat island studies.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
imaging (and associated planning) at neighborhood or district level		wide]		
Sea level rise modeling and planning	Program	Currently in effect [city-wide]	Yes	Dr. Philip Bedient of Rice University has done extensive research on sea level rise modeling.
Diversifying fuel sources				Not applicable
Evacuation systems	Program	Currently in effect [city-wide]		Evacuation Zones A through C have been identified for the City of Houston and Harris County, and letters have been assigned to zip codes based on their proximity to the coast. Public Officials such as the Mayor or County Judge will order evacuations for their communities based on the latest information on the expected storm surge from the National Hurricane Center. An evacuation map is included in the City of Houston Disaster Preparedness Guide for 2012. <a href="http://www.houstonoem.org/external/content/document/4027/1489043/1/City%20of%20Houston%20-%20DPG%20-%20English%20-%202012.pdf">http://www.houstonoem.org/external/content/document/4027/1489043/1/City%20of%20Houston%20-%20DPG%20-%20English%20-%202012.pdf</a>
Economic diversification				Not applicable
Landslide risk mapping				Not applicable
Monitoring and planning to maintain biodiversity	Program	Still under consideration or awaiting final authorization	Yes	Efforts are being made to saving the endangered Houston toad. <a href="http://www.chron.com/news/houston-texas/article/Stable-habitats-sought-for-endangered-Houston-3469701.php">http://www.chron.com/news/houston-texas/article/Stable-habitats-sought-for-endangered-Houston-3469701.php</a> The Houston Atlas of Biodiversity showcases the striking natural beauty, unique biodiversity, and globally important ecological resources the Houston metroplex and 24 surrounding counties possesses. <a href="http://houstonwilderness.org/img/pdf/HW%20Biodiversity%20Atlas%20(full%20low%20res).pdf">http://houstonwilderness.org/img/pdf/HW%20Biodiversity%20Atlas%20(full%20low%20res).pdf</a>

**A1.1**

**Is your city taking action on reducing flood risk?**

Yes

A1.1a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Site restoration and greening	Program	Currently in effect [city-wide]	Yes	<p>In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and</li> <li>• Change in Houston's image to attract the best and brightest to our city.</li> </ul>
Soil retention strategies	Program	Currently in effect [city-wide]	Yes	<p>In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in</li> </ul>



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston's image to attract the best and brightest to our city.
Permeable paving	Program	Currently in effect and being piloted	Yes	Public Works & Engineering have permeable paving pilot installations on Rice University Campus sidewalks and parking lots and at Cliff Tuttle Park.
Sustainable urban drainage	Program	Currently in effect and being piloted	Yes	ReBuild Houston is the City of Houston's initiative to improve the quality of life and mobility for residents of the city by rebuilding its drainage and street infrastructure. To support the initiative, the City has established a dedicated, pay-as-you-go fund to maintain the infrastructure, and to plan upgrades to meet future needs as the city grows. ReBuild Houston is a direct result of City of Houston voters approving Proposition One on November 2, 2010. A 10- year planning cycle will identify new projects based on need, prioritizing the worst needs first. ReBuild Houston will help: - Reduce street flooding -Improve mobility -Reduce structural flooding Rebuild Houston is now in its second year. In its first year, the City completed a total of 16 major street or drainage improvement projects and 12 local drainage projects, as well as continuing or starting another 14 major projects and 4 more local drainage projects. The City resurfaced 136 lane miles of asphalt streets, cleaned 75 miles of storm sewers and re-graded 277 miles of road ditches. To date, the City has already invested approximately \$180 million in improvements to its infrastructure since the program began.
Protect land from development	Incentive / Disincentive	Currently in effect [city-wide]	Yes	The City of Houston passed Ordinance No. 2012-739, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the Downtown Living Initiative Chapter 380 Program (Program) is to promote economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for certain new multifamily residential mixed-use developments. The target area comprising the east side of downtown offers exciting attractions and amenities including Discovery Green Park, Phoenicia Market, churches and schools (including the planned HISD High School for the Performing and Visual Arts), major hotels, three of the region's four major sports venues and the George R. Brown Convention Center, ranked in the nation's top twenty. This program incentivizes urban infill projects.
Restrict development in flood risk areas	Policy / Regulation	Currently in effect [city-wide]	Yes	Chapter 19 of the City Code of Ordinances addresses "flood-prone areas." This chapter provides a regulatory system to monitor the issuance of plats and permits to reduce the likelihood that development within the city will increase the dangers of flooding. One method is to place

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				restrictions or prohibitions of land uses that are dangerous to health, safety or property in times of flood, or cause excessive increases in flood heights or velocities. <a href="http://www.publicworks.houstontx.gov/planning/flood_plain_guidelines.html">http://www.publicworks.houstontx.gov/planning/flood_plain_guidelines.html</a>
Relocate vulnerable populations to low risk areas	Program	Currently in effect [city-wide]	Yes	Property acquisition by the Harris County Flood Control District falls into two main categories: (1) voluntary home buyout, and (2) project right-of-way acquisition. These are two very different activities, although the processes they follow share many similar steps. The most distinctive characteristic of voluntary home buyout is just that – it is voluntary and homeowners may choose to not sell their property to the District. The project right-of-way acquisition process is used when the purchase of land is deemed a public necessity. <a href="http://www.hcfdc.org/acquisition/">http://www.hcfdc.org/acquisition/</a>
Flood defences – development and operation	Policy / Regulation	Currently in effect [city-wide]	Yes	The 2012 Floodplain Management Plan (FMP) has been created by the City’s FMP Committee to document and coordinate the City’s floodplain management activities for the purpose of: -Reducing flood losses and impacts from flooding -Improving protection of the floodplain’s natural and beneficial functions -Supporting flood mitigation activities -Promoting awareness and attention to the City’s flooding problems -Fulfilling the requirements of the Community Rating System to maintain National Flood Insurance Program premium discounts for Houston’s flood insurance policy holders with standard rate policies in the 100 year and 500 year floodplains. <a href="http://www.publicworks.houstontx.gov/notices/flood_plain_guidelines.html">http://www.publicworks.houstontx.gov/notices/flood_plain_guidelines.html</a>
Flood storage – creation and operation	Policy / Regulation	Currently in effect [city-wide]	Yes	In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City’s green space and flooding challenges. There are numerous other benefits associated with utilizing the City’s bayou corridors for green space and recreation: • Reduced doctor visits due to increased access to recreation opportunities; • Increase in use of alternative transportation for commuting along the hike and bike trails; • Increase in property values along the corridor resulting in increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston’s image to attract the best and brightest to our city.
Building	Policy /	Currently in	Yes	Buildings must be designed to resist wind speeds per the building code.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
resilience and resistance	Regulation	effect [city-wide]		
Storm drains, swales and flood storage	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	Public Works & Engineering have pilot bioswale installations on Rice University, Kendall Library, Federal Reserve Bank Building, Museum Fine Arts - Bayou Bend, and Hermann Park Plaza. Also, ReBuild Houston is the City of Houston's initiative to improve the quality of life and mobility for residents of the city by rebuilding its drainage and street infrastructure. To support the initiative, the City has established a dedicated, pay-as-you-go fund to maintain the infrastructure, and to plan upgrades to meet future needs as the city grows. ReBuild Houston is a direct result of City of Houston voters approving Proposition One on November 2, 2010. A 10- year planning cycle will identify new projects based on need, prioritizing the worst needs first. ReBuild Houston will help: - Reduce street flooding -Improve mobility -Reduce structural flooding Rebuild Houston is now in its second year. In its first year, the City completed a total of 16 major street or drainage improvement projects and 12 local drainage projects, as well as continuing or starting another 14 major projects and 4 more local drainage projects. The City resurfaced 136 lane miles of asphalt streets, cleaned 75 miles of storm sewers and re-graded 277 miles of road ditches. To date, the City has already invested approximately \$180 million in improvements to its infrastructure since the program began.

**A1.2**

**Is your city taking action on reducing vulnerability to health externalities?**

Yes

**A1.2a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Air quality initiatives	Policy / Regulation	Currently in effect [city-wide]	Yes	Residents of the greater Houston area can track ozone levels through the Houston Clean Air Network. Sponsored by a three-year \$450,000 grant from Houston Endowment, this website provides real-time air quality updates using maps of the region. The Houston Clean Air Network (CAN) is a collaboration between local non-profits, businesses, researchers, and government agencies who share the goal of protecting public health from air pollution. CAN members are working together to reduce emissions by providing tools for understanding Houston's air pollution challenges. <a href="http://houstoncleanairnetwork.org">http://houstoncleanairnetwork.org</a> The City's SAFEClear program fights to save lives, reduce traffic congestion, cut down on the chaos of the previous system and ensure that citizens are treated fairly by wrecker drivers. <a href="http://www.houstontx.gov/safeclear/">http://www.houstontx.gov/safeclear/</a> The City is also considering a citywide anti-idling policy.
Disease prevention measures	Policy / Regulation	Currently in effect at a significant scale across most of the city	Yes	In September 2012, Mayor Annise Parker announced the launch of Healthy Houston, an initiative designed to reduce obesity and increase healthy eating and exercise. The initiative will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage the development of sustainable food systems and promote recreational opportunities. To lead the initiative, the Mayor has created a Healthy Houston Task Force. They will work to recommend and implement specific actions to reduce the incidence of obesity and its health and economic impacts in the City of Houston, including: <ul style="list-style-type: none"> <li>• Encouraging urban agriculture in community, school, backyard and rooftop gardens and, where feasible, on City property</li> <li>• Improving access to healthy, affordable and locally produced food for all neighborhoods</li> <li>• Supporting education regarding the physical and mental health risks of obesity and the benefits of sustainable agriculture, using locally produced food, consuming fresh fruits and vegetables, infant breastfeeding, providing healthy meals in our schools, physical activity and exercise, and maintaining a healthy weight</li> <li>• Enabling programs that increase physical activity and exercise in schools, at work, and in communities, including those that provide safe playgrounds and parks, pedestrian-friendly walkways, bicycle paths and other recreational opportunities</li> </ul>

**A1.3**

**Is your city taking action on reducing vulnerability to heat stress?**

Yes

A1.3a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Green roofs	Incentive / Disincentive	Currently in effect [city-wide]	Yes	Chapter 13 “STORMWATER QUALITY DESIGN REQUIREMENTS” of the Infrastructure Design Manual has the design criteria for permanent storm water pollution prevention procedures and controls to minimize impacts for new development and decrease impacts for redevelopment. The City of Houston's approved Low Impact Development (LID) infrastructure designs are included in the chapter. In addition, there is a drainage fee on properties within the City limits that is based on the amount of impervious surface within each parcel. Increasing the amount of pervious cover, adding additional detention, or using approved LID best management practices (e.g., green roofs, bio-retention, or porous pavement) can reduce the monthly drainage fee for that property.
White roofs	Policy / Regulation	Currently in effect [city-wide]		As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Green walls				Not applicable
Tree planting	Program	Currently in effect at a significant scale across most of the city	Yes	Tree City USA is a designation that Houston has proudly held for over 20 years. The program is sponsored by the National Arbor Day Foundation, in cooperation with the US Department of Agriculture Forest Service and the National Association of State Foresters. This recognition is awarded to cities that have met four standards: -Creating a tree board or department -Passing a tree care ordinance -Creating a community forestry program with an annual budget of at least \$2.00 per capita -Having an Arbor Day observation and proclamation By meeting these standards, the City of Houston has created a foundation from which to promote and enhance the city's urban forest. It demonstrates to the world that Houston values its trees and the benefits they bring to the environment. The Million Trees + Houston program is adding to the city's Urban Forest by planting more than a million new trees in a three to five year period. The program is coordinated by the Houston Parks and Recreation Department in partnership with Trees for Houston. Other partners include Harris County, the Texas Department of Transportation, and the Quality of Life Coalition.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Green space provision and expansion	Program	Currently in effect [city-wide]	Yes	In November 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City’s green space and flooding challenges. There are numerous other benefits associated with utilizing the City’s bayou corridors for green space and recreation: • Reduced doctor visits due to increased access to recreation opportunities; • Increase in use of alternative transportation for commuting along the hike and bike trails; • Increase in property values along the corridor resulting in increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston’s image to attract the best and brightest to our city.
Shading in public spaces, markets	Program	Still under consideration or awaiting final authorization	Yes	In the 2008-2011 TIP, the Transportation Policy Council committed \$1.5 million to fund Livable Center studies in the region. The goal of H-GAC’s Livable Centers Program is to help create walkable, mixed-use places that provide multi-modal transportation options, improve environmental quality, and promote economic development. Street trees are part of the proposal for all the studies.
Cooling systems for critical infrastructure	Program	Currently in effect [city-wide]		In FY 13, the City is spending approximately 35% of its Capital Improvement budget on maintenance and upgrades of existing infrastructure and the remaining towards new construction/expansion. The CIP budget is used for new infrastructure or replacement of infrastructure that can be capitalized. For maintenance of existing assets and infrastructure, the City relies on its O&M (Operations & Maintenance) funding.
Retrofit of existing buildings	Program	Currently in effect at a significant scale across most of the city	Yes	In the City’s municipal energy efficiency program, over 100 City facilities, 6 million square feet, are achieving guaranteed energy use reductions of 30% with paybacks of, on average, less than ten years. The City will be using qualified energy conservation bonds (QECBs) to fund the next portion of energy efficiency retrofits for the public libraries. Also, all City buildings are being benchmarked in EPA’s Portfolio Manager, over 300 buildings, in hopes to have as many of them achieve an Energy Star rating.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Other cool pavement measures				Not applicable

#### A1.4

Is your city taking action on reducing vulnerability to water stress?

Yes

#### A1.4a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
River abstraction protection	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.
Strategic use of urban green space for urban agriculture	Program	Currently in effect and being piloted	Yes	<p>In November 2012, the City launched the Urban Grows initiative. Urban Grows, part of the City of Houston's Healthy Houston initiative, aims to help communities build vegetable gardens, farms and orchards on vacant land in areas with poor access to healthy fresh foods, often referred to as food deserts. The City of Houston will provide lots through its LARA program (Land Assemblage Redevelopment Authority), which works to redevelop tax-delinquent and abandoned properties. Community members, partnering with local non-profits, foundations or churches, will then work to transform these vacant lots into usable, productive and attractive green spaces. Urban Grows is the first initiative launched as part of Mayor Parker's new program, Healthy Houston, which is designed to reduce obesity and increase healthy eating and exercise. Healthy Houston will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage the development of sustainable food systems and promote recreational opportunities. Urban Grows will:</p> <ul style="list-style-type: none"> <li>• Encourage urban agriculture in neighborhoods, utilizing vacant City property</li> <li>• Improve access to healthy, affordable and locally produced food for all neighborhoods</li> <li>• Support education regarding the benefits of sustainable agriculture</li> </ul> <p>Urban Grows will complement the City's existing efforts, including the launch of the City Hall Farmers Market and farmers markets at the City's multi-service centers; new vegetable container gardens downtown and throughout the City; and a Grocery Access Task Force that works with grocers on providing economic tools and incentives to help spur more supermarket and grocery development in areas where they are needed.</p>
Low flow taps	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	<p>In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management</p>



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				practices and conservation goals for the City.
Water butts	Program	Currently in effect at a significant scale across most of the city	Yes	The City organizes a half-price rain barrel and compost bin sale every year in the fall.
Xeriscapes – low water landscaping design	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.
Additional reservoirs and wells	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.
Water supply restrictions	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.

**A1.5**

Please detail any other actions your city is taking on climate adaptation.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Mobile Solar Generators	Policy / Regulation	Currently in effect and being piloted	Yes	The City of Houston acquired 17 SPACE units, which are mobile solar generators made with shipping containers. The generators are designed for emergency relief efforts and were purchased to serve in the recovery efforts from future hurricanes. The units contain refrigerators and air conditioning to provide relief and also to allow emergency equipment to be hooked up when needed.

**Page: Energy Supply**

**E0.1**

What percentage of the population has access to electricity?

100%

**E0.2**

What are the main sources for heating? Indicate TWh (thermal) and percent from each source:

Heating Sources	TWh	Percentage
Electricity	84	54%
Gas	70	45%
Oil		
Biomass		
Other solid fuels		
Other	1	1%

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**E0.3**

Does the city authority purchase energy (electricity/gas/heat/oil products) etc for use in its own buildings?

Yes

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**E0.3a**

Please state the percentage of the total cost of energy (electricity/gas/heat/oil products) for the following:

Buildings	Answer
Educational Facilities	
Hospitals	
Government buildings	
Leisure facilities	
Other	

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**E0.4**

Does the city have a district heating system?

Yes

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**E0.4a**

**What proportion of a city's buildings are connected to district heating systems?**

1%

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**E0.4b**

**If your city does have one or more district heating systems, what is the percentage of heat that they supply to:**

<b>Buildings</b>	<b>Answer</b>
Residential buildings	
Non-residential buildings	1%

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**E0.5**

**What is the annual energy bill for the city's buildings? (US\$)**

135000000

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**E0.6**

**Does the city have a long term energy procurement contract for municipal energy usage?**

Yes

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**E1.0**

**Is your city taking action on increasing renewable / low carbon energy generation?**

Yes

E1.0a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
On shore wind				Not applicable
Off-shore wind				Not applicable
Solar electricity (photovoltaics, concentrating solar)	Program	Currently in effect and being piloted		<p>The City has existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center. The Green Building Resource Center housed within the Houston Permitting Center provides education and shows real-time energy production of its rooftop solar panels. The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes. On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with HARC on streamlining and refining the solar permitting process. With the support of some federal grant funding, the City will be working on promoting market readiness of solar technologies. Grant funding will be used to make installing rooftop solar photovoltaic easier, faster, and cheaper for homeowners and businesses by implementing streamlined and standardized processes that will dramatically improve local market conditions. The City is also tracking legislation relating to solar, supporting bills such as PACE (Property Assessed Clean Energy) financing that help property owners break down the financial barriers to installing renewable energy projects. The City has explored potential ideas that would keep the market moving forward, including ICLEI's Solar Benefit program. This idea would reduce the complexity and cost of residential solar through a collective group discount program. The program would reach the residential sector via targeted outreach through employer organizations in Houston. The City of Houston is considering offering this solar program to City staff. Using grant funding, 17 mobile solar-powered shipping containers/generators</p>

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				(SPACE units) were acquired through a partnership with the University of Houston Green Building Components Program and placed at fire stations, parks, neighborhood centers and schools. The generators are designed for emergency relief efforts or cooling centers during times of extreme heat. When not being used in an emergency, they are used year-round for services, outdoor classrooms or to educate the public and bring awareness to solar projects.
Solar heat (solar thermal)				Not applicable
Anaerobic digestion	Procurement	Still under consideration or awaiting final authorization	Yes	One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Houston's innovation will: • Provide every residence with curbside One Bin for All services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Allowing technology and new process systems to sort household materials and derive an initial 55% diversion rate, and upwards of 75% with composting, anaerobic digestion and catalytic conversion (biomass-to-fuel) is more efficient and effective. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues.
Mechanical biological treatment	Procurement	Still under consideration or awaiting final authorization	Yes	One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies

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				<p>and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials.</p> <p>Houston's innovation will: • Provide every residence with curbside One Bin for All services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Allowing technology and new process systems to sort household materials and derive an initial 55% diversion rate, and upwards of 75% with composting, anaerobic digestion and catalytic conversion (biomass-to-fuel) is more efficient and effective. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues.</p>
Advanced thermal treatment / Waste to energy				Not applicable
Biofuels				Not applicable
Large scale biomass heating				Not applicable
Community renewable energy projects				Not applicable
Biomass gasification/pyrolysis	Procurement	Still under consideration or awaiting final authorization	Yes	<p>One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials.</p> <p>Houston's innovation will: • Provide every residence with curbside One Bin for All</p>

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Allowing technology and new process systems to sort household materials and derive an initial 55% diversion rate, and upwards of 75% with composting, anaerobic digestion and catalytic conversion (biomass-to-fuel) is more efficient and effective. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues.
Renewable fuel-- Combined heat and power or trigen				Not applicable
Fossil fuel--Combined heat and power or trigen				Not applicable

**E1.1**

**Is your city taking action on incentives for low carbon energy generation?**

Yes

**E1.1a**

**Please select the actions you are taking and provide details for each action.**



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Entering into long-term contracts with renewable heat generators				Not applicable
Property tax rebate	Program	Currently in effect [city-wide]	Yes	In September 2009, Houston enacted Ordinance No. 2009-858, the City of Houston Tax Abatement Program, which establishes a partial tax abatement for commercial buildings that meet LEED standards. A revised standard was passed in December 2011 extending the tax abatement program until December 14, 2013. In order to qualify for the abatement, applicants must register with the US Green Building Council and then submit an application for the abatement prior to beginning any construction on the project. The tax abatement benefit will not become affective until construction of the project has completed and LEED certification is obtained. In addition, projects must meet a minimum investment level for the incremental cost of obtaining the LEED certification.
Generation incentives				Not applicable
Investment incentives				Not applicable
District tax incentives for district heating/electric				Not applicable

## E1.2

**Is your city taking action on optimizing heat generation?**

Yes

### E1.2a

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Fuel switching				Not applicable
Optimizing existing turbines				Not applicable
Increase capture of waste heat	Program	Currently in effect [city-wide]	Yes	Houston-based Thermal Energy Corporation (TECO) has provided reliable, cost-effective and energy-efficient heating and cooling to institutions in the Texas Medical Center since 1969. TECO uses district energy and CHP technology to produce chilled water and steam, which we pipe underground to more than 18 million square feet of customer buildings at 18 institutions. With a solid track record of performance, TECO is well-positioned to provide the energy behind what's next for the buildings and pace-setting services and research at the world-renown Texas Medical Center. The Houston airport systems utilizes waste heat recovery as well.
Heat gen asset replacement	Program	Currently in effect [city-wide]		Many buildings have replaced boilers.

### E1.3

**Is your city taking action on optimizing existing / new power stations?**

No

### E1.3a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description

### E1.4

**Please detail any other actions your city is taking on energy supply.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Solar Benefits Program	Program	Still under consideration or awaiting final authorization	Yes	The City has explored potential ideas that would keep the solar market moving forward, including ICLEI's Solar Benefit program. This idea would reduce the complexity and cost of residential solar through a collective group discount program. The program would reach the residential sector via targeted outreach through employer organizations in Houston. The City of Houston is considering offering this solar program to City staff.
Promoting Commercial Solar	Incentive / Disincentive	Currently in effect and being piloted	Yes	In the commercial sector, there are companies that are implementing solar projects as a testament to their corporate sustainability mission. The City wants to bring recognition to those Houston companies, such as IKEA and Smith and Associates, and celebrate their dedication to leading the charge in the private sector. Other companies, such as NRG, are providing more affordable solutions for residential solar by offering a solar lease program to their customers.
Mobile Solar Generators	Procurement	Currently in effect and being piloted	Yes	The City understands the need for clean, renewable energy is not only to improve the environment but also to offer more reliability during times of extreme weather events. Using grant funding, 17 mobile solar-powered shipping containers/generators (SPACE units) were acquired through a partnership with the University of Houston Green Building Components Program and placed at fire stations, parks, neighborhood centers and schools. The generators are designed for emergency relief efforts during hurricanes or cooling centers during times of extreme heat. When not being used in an emergency, they are used year-round for services, outdoor classrooms or to educate the public and bring awareness to solar projects.
Education/Outreach	Program	Currently in effect and being piloted	Yes	The City of Houston constantly strives to keep solar at the forefront of its sustainability vision, striking a balance between increasing market growth and decreasing regulatory barriers. With existing installations at the George R. Brown Convention Center, City Hall Annex, Discovery Green, and most recently, the Houston Permitting Center, the City is a test bed for solar technologies. The Green Building Resource Center provides leadership and education and shows real-time energy production of its rooftop solar panels. This center provides valuable resources to better inform the public when they are ready for solar and citizens are able to learn what system works best in this climate and location.
Residential Solar	Incentive / Disincentive	Currently in effect and being piloted	Yes	The City's 5-Star Program is a creative way to couple renewable energy systems and energy efficiency projects. The 5-Star Program "sustainably" reinvests in

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				Houston's historic neighborhoods. Builders receive incentives to build energy efficient homes and add photovoltaics and solar thermal as upgrades to these newly completed homes.
Regulatory action/Legislation	Policy / Regulation	Currently in effect and being piloted	Yes	On the regulatory side, funded by the DOE's SunShot Rooftop Solar Challenge grant, the City worked with the Houston Advanced Research Center on streamlining and refining the solar permitting process. With the support of some federal grant funding, the City will be working on promoting market readiness of solar technologies. Grant funding will be used to make installing rooftop solar photovoltaic easier, faster, and cheaper for homeowners and businesses by implementing streamlined and standardized processes that will dramatically improve local market conditions. The City is also keeping track of legislation relating to solar, supporting bills such as PACE (Property Assessed Clean Energy) financing that help property owners break down the financial barriers to installing renewable energy projects.
District Cooling	Program	Currently in effect and being piloted	Yes	Downtown Houston houses the Union Station District Energy Center, which has an underground piping network in downtown, totaling about 4 miles in length. The piping grid connects the district energy center with other customers, including Minute Park and the Alley Theatre. This system serves 24 buildings, which is approximately 6.5 million SF in downtown Houston. Overall, Entergy Solutions District Cooling provides service to approximately 7.2 million SF of space with an efficiency of 0.88 kwh/ton-hour.
Mandatory Utility Energy Savings	Policy / Regulation	Currently in effect [city-wide]	Yes	CenterPoint Energy's goals are mandated by the Public Utility Commission of Texas. For 2013, CenterPoint Energy has to achieve savings equivalent to 30% of the average 5-year demand load growth.

**Page: Community Scale Development**

**D0.1**

**What percentage of the total area of the city is classified as agricultural land?**

7%

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**D0.2**

**How much green space (ie parks) does the city have? (In square meters)**

153177562

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**D0.3**

**Compared to 2 years ago, has the green space in the city grown or reduced in size or stayed the same?**

Grown

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**D0.4**

**Have major regeneration sites been identified in the city?**

Yes

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**D0.4a**

**Are there environmental sustainability requirements for the sites?**

Yes

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**D1.0**

**Is your city taking action on delivering a 'compact city' strategy?**

Yes

D1.0a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
New buildings developed within compact city framework	Incentive / Disincentive	Currently in effect and being piloted	Yes	The City of Houston passed Ordinance No. 2012-739, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the Downtown Living Initiative Chapter 380 Program (Program) is to promote economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for certain new multifamily residential mixed-use developments. The target area comprising the east side of downtown offers exciting attractions and amenities including Discovery Green Park, Phoenicia Market, churches and schools (including the planned HISD High School for the Performing and Visual Arts), major hotels, three of the region's four major sports venues and the George R. Brown Convention Center, ranked in the nation's top twenty.
Smaller, more efficient offices (office planning)				Not applicable
Strategic adaptation of current unused buildings for new purposes	Policy / Regulation	Currently in effect [city-wide]	Yes	Since its inception in the early 1830s, Houston has encountered many transformations. The development of Houston from a tiny village to a substantial metropolitan city is recognized and interpreted through its remaining historic structures. In 1995, City Council adopted Houston's Historic Preservation Ordinance in effort to help preserve the significant reminders of the city's collective past as represented through the built environment. Through this ordinance, the City of Houston offers a process and methods to maintain Houston's architectural history. Landmark and Protected Landmark designations allow for both recognition and protection of individual historic structures, while Historic District designations encourage the recognition and protection of neighborhoods with distinct historic character by classifying a specific bounded area historically significant.
Density bonus for new developments	Incentive / Disincentive	Currently in effect [city-wide]	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				Houston's Major's Office. The City of Houston passed Ordinance No. 2012-739, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the Downtown Living Initiative Chapter 380 Program (Program) is to promote economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for certain new multifamily residential mixed-use developments. The target area comprising the east side of downtown offers exciting attractions and amenities including Discovery Green Park, Phoenicia Market, churches and schools (including the planned HISD High School for the Performing and Visual Arts), major hotels, three of the region's four major sports venues and the George R. Brown Convention Center, ranked in the nation's top twenty.
Minimum density requirements				Under Chapter 42 (Subdivisions, Developments and Platting Ordinance) • General development structure allows for mixed land use development. The "unrestricted reserve" designations allows parcels to be platted without any restriction to the land use. • Created optional performance standards that allow transit oriented developments to receive reduced building setbacks along the existing and proposed Metro Rail/BRT corridors. • Propose to remove the "urban area" and "suburban area" designations as defined by boundary created by Loop 610. Create a core set of rules that apply to the City and the Extra Territorial Jurisdiction (ETJ). Establish optional, city-wide performance standards for single-family residential developments and reduced building lines for commercial, retail, and multi-family developments along major thoroughfares with a planned right-of-way of 80-feet or less. • Propose to establish a minimum lot size of 3,500 SF in the city. The minimum lot size of the ETJ will remain 5,000 SF. • Propose to allow lot size averaging within the city. Lots may be less than 1,400 SF if the average lot area in the subdivision or block face is a minimum of 1,400 SF. • Propose to allow lot width averaging within the city. Lots may have an average lot width of 18-feet within a subdivision or block face as long as no lots are less than 15-feet in width. • Propose to require lots immediately adjacent to the public street and opting into a reduced building setback performance standard to have a front door and pedestrian access to the public street.
Developing underused areas	Incentive / Disincentive	Currently in effect and being piloted	Yes	The City of Houston passed Ordinance No. 2012-739, which established an economic development program called the Downtown Living Initiative Chapter 380 Program. The purpose of the Downtown Living Initiative Chapter 380 Program (Program) is to promote

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				economic development and stimulate business and commercial activity in the target area by providing economic and other development incentives for certain new multifamily residential mixed-use developments. The target area comprising the east side of downtown offers exciting attractions and amenities including Discovery Green Park, Phoenicia Market, churches and schools (including the planned HISD High School for the Performing and Visual Arts), major hotels, three of the region's four major sports venues and the George R. Brown Convention Center, ranked in the nation's top twenty.
Support eco districts				Not applicable

**D1.1**

**Is your city taking action on transit oriented development?**

Yes

**D1.1a**

**Please select the actions you are taking and provide details for each action.**



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Expand transit to support current development	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Major's Office.
Encourage new development to be in transit strong areas	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Major's Office.
Using current transportation infrastructure projects as potential for new development	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	Indirect financial incentives are in place which work to promote desired density, and related built forms, in and around Light Rail Transit (LRT) Stations by allowing reduced parking and setbacks. Where feasible, financial incentives are provided on a case-by-case basis as administered through the Economic Development division of the City of Houston's Major's Office.
Restricting parking spaces in new development	Policy / Regulation	Currently in effect [city-wide]	Yes	In the City of Houston Ordinance No. 2013-208 regarding parking requirements, if a development adds bicycle spaces, is a transit-oriented development, or a historic building, it can reduce its parking space requirement. Under Chapter 26 (The Off-Street Parking Ordinance) • Require bicycle parking for new commercial, retail, and office. Provide incentives that allow for reduced automobile parking up to 10% if additional bicycle parking is provided. • Expand options within the Shared Parking table to allow more uses to participate in shared parking and expand the time periods, thereby reducing the overall number of parking spaces. Director is given discretion to waive up to 10% of the total number of spaces based upon detailed parking study. • Establish procedures and criteria to allow areas to create different parking standards, such as reduced parking requirements, expanded distance for off-site parking, or even the removal of parking

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				<p>requirements. These areas are called Special Parking Areas and are the next generation of Parking Management Areas. • Per requests from the community, the “Warehouse District” on the north side of Downtown has now been included in the Central Business District (CBD) – a district exempt from off-street parking requirements. • Allow a 40% reduction in the parking requirements for a protected landmarked or contributing structure within a historic district that receives an approved Certificate of Appropriateness • Allow grandfathered uses to redevelop into a less intense use without providing additional parking provided, however, they maintain existing parking spaces. • Allow a 20% reduction in the parking requirements for transit-orientated developments that opt-in to the pedestrian/transit focused performance standards found in Chapter 42.</p> <p><a href="http://www.houstontx.gov/planning/DevelopRegs/offstreet/docs_pdfs/Chapter26_Ordinance_march_2013.pdf">http://www.houstontx.gov/planning/DevelopRegs/offstreet/docs_pdfs/Chapter26_Ordinance_march_2013.pdf</a></p>
Reducing private vehicle transit	Policy / Regulation	Currently in effect [city-wide]	Yes	<p>In the City of Houston Ordinance No. 2013-208 regarding parking requirements, if a development adds bicycle spaces, is a transit-oriented development, or a historic building, it can reduce its parking space requirement.</p> <p><a href="http://www.houstontx.gov/planning/DevelopRegs/offstreet/docs_pdfs/Chapter26_Ordinance_march_2013.pdf">http://www.houstontx.gov/planning/DevelopRegs/offstreet/docs_pdfs/Chapter26_Ordinance_march_2013.pdf</a></p>

**D1.2**

**Is your city taking action on building codes and/or standards for new houses?**

Yes

**D1.2a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Energy performance rating for new buildings	Policy / Regulation	Currently in effect [city-wide]		Beginning February 1, 2013, the City of Houston Energy Code for residential structures will require that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. Yes, the City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Environmental impact assessment				Not applicable
Lighting efficiency standards	Policy / Regulation	Currently in effect [city-wide]		Beginning February 1, 2013, the City of Houston Energy Code for residential structures will require that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. Yes, the City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
HVAC efficiency standards	Policy / Regulation	Currently in effect [city-wide]		Beginning February 1, 2013, the City of Houston Energy Code for residential structures will require that new buildings achieve 10% efficiency above the currently adopted Houston Energy Code (i.e. 10% above IECC 2009). Houston is the first city in Texas to be 10% above IECC 2009. Per an ordinance adopted in 2011, City Council will vote again at the end of 2013 to adopt 15% above IECC 2009, putting Houston in compliance with IECC 2012. Yes, the City has the authority to set residential building energy codes that meet or are more stringent than the statewide code.
Appliance efficiency standards				Not applicable
Green community rating system (EED-ND, GreenStar, Enterprise Communities, etc.)				Not applicable

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Require connection to district heating/cooling				Not applicable

**D1.3**

**Is your city taking action on building codes and/or standards for new commercial and industrial buildings?**

Yes

**D1.3a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Energy performance rating for new buildings	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Environmental impact assessment				Not applicable
Lighting efficiency standards	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
HVAC efficiency standards	Policy / Regulation	Currently in effect [city-wide]	Yes	As of September 2011, commercial buildings in Houston had to comply with ASHRAE 90.1-2007 or 2009 IECC commercial energy code. The City has also passed a mandatory cool roof requirement for new construction and roof replacements.
Appliance efficiency standards	Policy / Regulation	Currently in effect and being piloted	Yes	Under Administrative Procedure 7-1 City Energy Efficiency Policy, Section 7.2.7 Equipment Purchasing specifies that all equipment, appliance and computer purchases should be Energy Star rated, when possible. This is applicable to municipal buildings only.
Green community rating system (EED-ND, GreenStar, Enterprise Communities, etc.)	Program	Currently in effect at a significant scale across most of the city	Yes	One of the goals for the Houston Green Office Challenge was to help participants achieve Energy Star or LEED certifications for their buildings. The City had 400 participants in this voluntary program. Houston is #5 in the nation for the number of LEED certified buildings (207 total).
Require connection to district heating/cooling				Not applicable

#### D1.4

**Is your city taking action on supporting brownfield redevelopment?**

Yes

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**D1.4a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Support brownfield redevelopment	Program	Currently in effect at a significant scale across most of the city	Yes	The Houston Brownfield Program seeks to help redevelop and revitalize properties that are abandoned or underutilized due to real or perceived contamination. Brownfield Properties can include sites such as old gas stations and auto body shops, abandoned industrial facilities, and many more. Our program offers comprehensive services to help with these problem properties. <a href="http://www.houstontx.gov/brownfields/">http://www.houstontx.gov/brownfields/</a>

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**D1.5**

Is your city taking action on protecting green and open spaces from development?

Yes

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**D1.5a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Greenbelts	Program	Currently in effect at a significant scale across most of the city	Yes	<p>In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and</li> <li>• Change in Houston's image to attract the best and brightest to our city.</li> </ul>
Large scale green and open space within city	Program	Currently in effect at a significant scale across most of the city	Yes	<p>In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation:</p> <ul style="list-style-type: none"> <li>• Reduced doctor visits due to increased access to recreation opportunities;</li> <li>• Increase in use of alternative transportation for commuting along the hike and bike trails;</li> <li>• Increase in property values along the corridor resulting in increased revenue to the city;</li> <li>• Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces;</li> <li>• Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff;</li> <li>• Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and</li> <li>• Change in Houston's image to attract the best and brightest to our city.</li> </ul>

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Home gardens/garden plots	Policy / Regulation	Currently in effect [city-wide]	Yes	<p>our city.</p> <p>Many citizens are interested in creating Natural Areas as part of their home landscaping to reduce maintenance, attract wildlife, and create garden diversity. However, going the natural area route within the city does not mean simply allowing an area to go unmanaged. The City of Houston Ordinance 32-10 defines a "natural area" as an area of native vegetation within planned and managed landscape. The ordinance gives the Houston Parks and Recreation Department, under the authority of the Director of the Department, the authority to create Rules and Regulations for Natural Areas. Permitting authority for Natural Areas is also given to the department by city ordinance. In addition, the ordinance stipulates what is considered native vegetation and the parameters for use of such plants in the creation, preservation, or restoration of natural plant communities.</p> <p><a href="http://www.houstontx.gov/parks/naturalareaspermit.html">http://www.houstontx.gov/parks/naturalareaspermit.html</a></p>

**D1.6**

**Is your city taking action on increasing green space?**

Yes

**D1.6a**

**Please select the actions you are taking and provide details for each action.**



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Fees to access city green space / parks				Not applicable
Opening schoolyards for public use				The SPARK School Park Program is a non-profit organization operating out of the City of Houston Mayor's office. Developed in 1983 as a way to increase park space in Houston, Texas, Former City Council Member, Eleanor Tinsley, created SPARK to develop public school grounds into neighborhood parks. An inter-local agreement, one of the first in Houston, between the city, the Houston Parks Board and the school district, formally established the SPARK program. SPARK combines the resources of the Department of Housing and Community Development, seven local school districts, Harris County, the private sector, neighborhood group, PTA/PTO groups and concerned citizens. <a href="http://www.sparkpark.org/">http://www.sparkpark.org/</a>
Convert former landfills into parkland				Not applicable

**D1.7**

**Is your city taking action on delivering an Eco-District development strategy?**

Yes

**D1.7a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
District heating/cooling	Program	Currently in effect and being piloted	Yes	There are 16 district energy systems in the city. Downtown Houston houses the Union Station District Energy Center, which has an underground piping network in downtown, totaling about 4 miles in length. The piping grid connects the district energy center with other customers, including Minute Park and the Alley Theatre. This system serves 24 buildings, which is approximately 6.5 million SF in downtown Houston. Overall, Entergy Solutions District Cooling provides service to approximately 7.2 million SF of space with an efficiency of 0.88 kwh/ton-hour. Also, the Thermal Energy Corporation (TECO) has the largest district cooling system in the country and owns and operates a CHP-based district energy system in the Texas Medical Center.
District electricity generation				Not applicable

**D1.8**

**Is your city taking action on encouraging low carbon industries?**

No

**D1.8a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description

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**D1.9**

**Is your city taking action on facilitating urban agriculture?**

Yes

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**D1.9a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Rooftop and vertical gardens	Program	Currently in effect and being piloted	Yes	The City has roof garden using native plants at the Houston Permitting Center.

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**D1.11**

**Is your city taking action on preservation and improvement of bio-diversity and natural assets?**

Yes

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**D1.11a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Tree planting	Program	Currently in effect [city-wide]	Yes	The Million Trees + Houston program is adding to the city's Urban Forest by planting more than a million new trees in a three to five year period. The program is coordinated by the Houston Parks and Recreation Department in partnership with Trees for Houston. Other partners include Harris County, the Texas Department of Transportation, and the Quality of Life Coalition. In the interest of creating a greener, more livable city, many private corporations are joining the effort through a special "Gift of Trees" program. <a href="http://www.houstontx.gov/parks/forestry/milliontrees.html">http://www.houstontx.gov/parks/forestry/milliontrees.html</a>
Reforestation	Program	Currently in effect at a significant scale across most of the city	Yes	Memorial Park Conservancy (MPC) and the Houston Parks and Recreation Department (HPARD) have started planting new trees in Memorial Park, which suffered massive tree loss after a severe drought in 2011. The Memorial Park Forestry Conservation & Management Plan will work on replanting thousands of trees.
Conservation efforts for natural areas	Policy / Regulation	Currently in effect [city-wide]	Yes	The Tree Protection Ordinance as contained in sections V and VI of Chapter 33 of the City of Houston Code of Ordinances pertains to the protection and preservation of trees and shrubs on city property. This includes trees on right-of-ways, medians, parks and other city property. A permit is required to remove any tree on city property or on a setback.
Ecological corridor support	Policy / Regulation	Currently in effect [city-wide]	Yes	The Tree Protection Ordinance as contained in sections V and VI of Chapter 33 of the City of Houston Code of Ordinances pertains to the protection and preservation of trees and shrubs on city property. Under this ordinance, City Council has been given the power to designate a green corridor to consist of right-of-ways of a major thoroughfare and building setback areas of abutting and adjacent properties in order to enhance the beauty of our city. Within the corridor, existing trees are given enhanced protection and the varieties of acceptable new trees are listed. The ordinance requires any tree removal in the corridor to be authorized by city permit, and the tree must be replaced by a specifically stated formula. This applies to trees affected by new construction or renovation of existing structures or parking lots.
Stewardship of existing current open spaces	Program	Currently in effect at a significant scale across most of the city	Yes	In November, 2012, city voters passed a bond referendum for the Bayou Greenways Initiative. Over the next ten years, the Bayou Greenways will add 4,000 acres of new and equitably distributed green spaces that can also serve the function of flood control and storm water quality enhancement. It will also complete 300 miles of continuous all-weather hike and bike trails that will meander through those greenways — an amenity unparalleled in the nation. Developing

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				green corridors along the bayous with connected trails bring a smart and sustainable resolution to alleviate the City's green space and flooding challenges. There are numerous other benefits associated with utilizing the City's bayou corridors for green space and recreation: • Reduced doctor visits due to increased access to recreation opportunities; • Increase in use of alternative transportation for commuting along the hike and bike trails; • Increase in property values along the corridor resulting in increased revenue to the city; • Increased flood prevention due to the opportunity for wet-bottom detention areas in the newly created green spaces; • Increased water quality due to the simple plantings located strategically along the bayous, the wet-bottom detention ponds, and reduced runoff; • Increased air quality due to increased CO2 sequestration by newly planted trees and grasses, and use of trails for alternative transportation; and • Change in Houston's image to attract the best and brightest to our city.
Environmental Impact Assessment of new development				Not applicable

**D1.12**

Please detail any other actions your city is taking on community scale development.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Green Roads	Program	Currently in effect and being piloted	Yes	Midtown is committed to the pedestrian-friendly, sustainable design elements of the currently approved design of Bagby Street. The goal is to develop a plan which will maintain the Midtown community's vision of a sustainable GreenRoads project which provides a balance of vehicular mobility, pedestrian mobility, and roadside parking.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Expedited Permitting for LEED Projects	Incentive / Disincentive	Currently in effect [city-wide]	Yes	For registered LEED projects, plans are eligible for expedited plan review. LEED projects will also qualify for a graduated rebate of the Quick Start fees (as shown on the plan review procedures guidelines.) The City is also supporting commercial PACE legislation that is currently being proposed in the Texas legislature (HB 1094 and SB 385, 83rd Texas Legislative Session).
Promoting Transit-Oriented Development	Policy / Regulation	Currently in effect and being piloted	Yes	Certain performance standard – which work to promote sustainable development practices – are provided as an opt-in option for developments occurring in either urban and/or within a certain vicinity of transit stations. Although building heights are not restricted by the City of Houston, there is a Residential Buffering Ordinance that regulates development adjacent to stable single-family residential neighborhoods. Mixed use is development, on the other hand, is a trend with increasing popularity within the City, and is further encouraged and incentive via reduced parking requirements as specified in Chapter 26 of the City Code of Ordinances. Reduced parking restriction are provided in areas around Transit Stations (Light Rail – LRT) and other mix use focused projects where reduced parking requirements are most appropriate further encouraging accommodation other non-vehicular modes of transportation as well as shared use parking agreements. In addition, our parking rules allow the creation of special parking areas for the purposes of increasing distance of parking to businesses, reducing parking ratios and sharing parking. This provision will allow for better utilization of the land, promote park once opportunities, walking and shared parking reducing the number of surface parking lots.
Combined Metropolitan Transportation/Multi-Modal Plan	Policy / Regulation	Still under consideration or awaiting final authorization	Yes	As the 4th largest city in the US, Houston recognizes the importance of its regional partners and is in constant coordination with the regions transit agencies– METRO, the Gulf Coast Rail District, the state highway system – TxDOT and other regional planning groups such as the local MPO – Houston-Galveston Area Council (H-GAC). As a region, our goal is to provide the most efficient and effective transportation network possible. Through the Sustainable Communities Regional Planning Grant, the City of Houston and partnering communities, are evaluating different strategies that would improve the sustainability of the region as a whole as it applies to each community's specific needs ( <a href="http://www.ourregion.org/about.html">http://www.ourregion.org/about.html</a> ). Similarly, the City is working closely with METRO's as it re-envision current transit routes, service types and related infrastructure requirements. In partnership with H-GAC, METRO aim to improve connections and efficiency between mode types with such studies as the METRO Bike and Ride Sub-regional Planning Study which works to better understand and accommodate both transit and bicycle users of the greater network

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				<p>(<a href="http://www.h-gac.com/taq/sub_regional/metro.aspx">http://www.h-gac.com/taq/sub_regional/metro.aspx</a>). Additionally, the City is developing a Mayoral Executive Order that embraces complete streets. The City of Houston requires sidewalk facilities be provided for increased connectivity as well as safe accommodation of the pedestrian environment just adjacent to the street. Roadway connectivity and access are controlled via the City's Major Thoroughfare and Freeway Plan (MTFP) which designate both current and future roadway type and intended capacity based on projected use or Average Daily Traffic Flows (ADT). Bicycle facilities are in accordance with the City of Houston Bike Program where proper facility type is analyzed at roadway construction to ensure adequate spacing within designated Right of Way (ROW). To further enhance and understand the demands on our Roadway network, the City has also executed a number of mobility studies which center on a multimodal – or multiple modes of transportation – approach for all users of the transportation system. The studies balance the city's mobility needs with the communities character and development context. These studies are critical in developing a comprehensive Transportation Plan for Houston.</p>

**Page: ICT**

**I0.1**

**What proportion of people have access to the internet at home or at work?**

100%

**I0.2**

**How many wireless hotspots are there in your city?**

600

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**I0.3**

**How many registered wireless hotspot users do you have?**

1000000

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**I0.4**

**Does your city government have a website?**

Yes

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**I0.5**

**Does the Mayor have a Twitter account, Facebook page, or some online communications forum to the public?**

Yes

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**I0.6**

**Can the public connect to the Mayor or city officials online (i.e.- email address)?**

Yes

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**I0.7**

**Is there someone who is responsible for information communication technology strategy across the whole city?**

Yes

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**I0.8**

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**Does the city have an overview of total spend on ICT across the city?**

Yes

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**I0.9**

**Does the city have a technical architecture which includes all ICT in use across the city?**

Yes

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**I0.11**

**Has the Mayor/city government assessed the economic case for the strategic use of ICT in the city?**

Yes

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**I0.12**

**Are there staff members within the city with a role specifically responsible for ICT?**

Yes

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**I0.13**

**Does the city have an ICT carbon reduction target?**

No

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**I0.14**

**Does your city have an internet connectivity target?**

Yes

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**10.15**

**Does your city have a wireless hotspot target?**

Yes

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**11.0**

**Is your city taking action on SMART public transport?**

Yes

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**11.0a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Real-time information on routes and availability	Program	Currently in effect [city-wide]	Yes	Houston TranStar is a partnership of four government agencies that are responsible for providing Transportation Management and Emergency Management services to the Greater Houston Region. Houston TranStar, a national leader in freeway incident management, uses state-of-the-art technologies to reduce congestion on major roadways. Monitoring traffic incidents with more than 730 regional Closed Circuit Television Cameras (CCTVs), staff at the TranStar center dispatch vehicles to remove debris or hazardous materials, communicate with emergency vehicles about the most direct routes to an accident scene, and send tow trucks to stalled vehicles. Dynamic Message Signs (DMS), deployed from Houston TranStar, inform travelers about expected travel times and traffic issues ahead. Synchronized traffic signals, speed sensors, Highway Advisory Radio, ramp meters and other devices also help keep the region's traffic moving. Houston TranStar was the first center in the nation to combine Transportation and Emergency Management centers, and the first to bring four agencies together under one roof. Houston TranStar's web site, nationally and locally

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				recognized for the breadth of information it offers the general public, allows subscribers to receive personalized travel time updates and incident warnings, as well as providing up-to-the-minute traffic and weather information. <a href="http://www.houstontranstar.org/">http://www.houstontranstar.org/</a>
Smart card ticketing	Program	Currently in effect [city-wide]	Yes	The METRO Q® Fare Card is an electronic wallet for METRO riders. This unique card contains a computer chip that stores riders' cash balance directly onto the card. Fares are automatically deducted from the card each time a person rides, just like a debit card. The METRO Q®, which stands for "quick," also provides free transfers and tracks progress toward earning five free trips for every 50 paid trips.
Matching systems for carpooling	Program	Currently in effect at a significant scale across most of the city	Yes	NuRide is the nation's largest rewards program for individuals who utilize commute alternatives by carpooling, vanpooling, biking, walking, telecommuting and taking public transportation. NuRide is a free service that can match carpoolers who live and work near each other as well as provide rewards and special offers to all NuRide members who track trips. NuRide is supported by the Houston-Galveston Area Council and local and national sponsors.
Road pricing that's responsive to real time information	Incentive / Disincentive	Currently in effect at a significant scale across most of the city	Yes	METRO HOT (High Occupancy Toll) Lanes allow drivers without passengers (single-occupant vehicles or SOVs) to use the HOV (High Occupancy Vehicle) Lane – for a toll. Traffic monitoring systems help METRO maintain traffic speeds to ensure optimal travel times for existing HOV Lane users, as well those using the METRO HOT Lanes. If speeds slow, single-occupant vehicles are not allowed in the HOV Lane. The lane is also be closed during peak traffic periods – specific to each METRO HOT Lane corridor - to single-occupant vehicles. METRO HOT Lanes benefits: -Provides new options for commuters -Increases safety and promotes quick response to accidents and issues in the lanes, thanks to additional camera monitoring -Improves air quality by reducing traffic congestion -Better utilizes existing HOV Lanes -Offers increased enforcement of the HOV Lane system - Revenue generated from tolls will contribute to the operation, maintenance and enforcement costs for METRO HOT Lanes Tolls are based on time of day and the congestion level of each METRO HOT Lane. METRO will publish the toll rate for specific corridors prior to opening, and tolls will be prominently displayed along each corridor. <a href="http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx">http://www.ridemetro.org/Services/HOTLanes/FAQs.aspx</a>
Charging station mapping and availability				The Houston Drives Electric website updates its charging station map periodically to show where public EV charging is available. The City is a partner in the Center for Commercialization of Electric Technologies and helped with the Texas Triangle Plug-in Electric Vehicle Readiness Plan, which was released in October 2012. Appendix 3B summarizes activities that encourage or facilitate PEVs and outline the number of existing PEVs and equipment in the Houston region. <a href="http://www.greenhoustontx.gov/ev/">http://www.greenhoustontx.gov/ev/</a>

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Tel-commuting / flexible work schedules	Program	Currently in effect and being piloted	Yes	For City of Houston departments, opportunities for teleworking, flexible schedules, and compressed work weeks differ by department. The Houston-Galveston Area Council oversees the Regional Telework Program and offers free consulting services through the Commute Solutions Program to help start companies with their telework program or expand their existing telework program. They have also developed an Employer Telework Kit and offer grants to businesses wanting to begin or expand their teleworking program. <a href="http://www.mysolutionis.com/hr-management/telework/default.aspx">http://www.mysolutionis.com/hr-management/telework/default.aspx</a>
Bike scheme systems that track availability of bikes and locations for drop off	Program	Currently in effect at a significant scale across most of the city	Yes	The City launched its bike share program, Houston Bike Share, in May 2012, which is an active transportation alternative for the City. Houston's initial phase has been successful and, received funding support from Blue Cross Blue Shield TX and the US Department of Energy, totaling nearly \$2 million. On April 3, 2013, Houston B-cycle, expanded from 3 to 21 stations and from 18 to 175 bicycles. This Phase II expansion creates a presence not only in Downtown, but also in the East End, Midtown, Montrose and the Museum District/Hermann Park with four of the stations located at key METRORail stops. Phase III expansion discussions and planning include the Texas Medical Center and local universities, as well as additional neighborhoods. Pollution, traffic, and rising oil costs are just a few of the reasons why Houstonians need options for getting around. <a href="http://www.houston.bcycle.com">www.houston.bcycle.com</a> The bike share system tracks availability of bikes and where the bikes can be docked via a mobile app or the website.
Apps for real time bike and ped routes	Program	Still under consideration or awaiting final authorization	Yes	An app for bike and ped routes has been discussed and is under consideration.

## I1.1

### Is your city taking action on SMART Energy?

Yes

#### I1.1a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Smart Grids	Program	Currently in effect [city-wide]	Yes	CenterPoint Energy Houston Electric's (CPE) Smart Grid project involves deployment of a fully integrated advanced metering system and Web portal access to over 2.2 million customers, along with installation of advanced monitoring and distribution automation equipment. The project aims to reduce peak loads, overall electricity use, and operations and maintenance costs while increasing distribution system reliability. The project implements secure communications to: (1) allow smart meter customers to view their electricity consumption data whenever they want through the Smart Meter Texas (SMT) data exchange, and (2) allow CPE to effectively visualize and operate the distribution system. As a transmission and distribution service provider, CPE provides metering data to retail energy providers (REPs) through the SMT data exchange. The billing data and customer systems enable REPs to offer information feedback, new pricing programs, and other electric service options to customers. The project also deploys a more advanced distribution management system and automated feeder switching, that reduces operational costs and improves service reliability.
Smart meters/controls	Program	Currently in effect [city-wide]	Yes	CenterPoint Energy Houston Electric's (CPE) Smart Grid project involves deployment of a fully integrated advanced metering system and Web portal access to over 2.2 million customers, along with installation of advanced monitoring and distribution automation equipment. The project aims to reduce peak loads, overall electricity use, and operations and maintenance costs while increasing distribution system reliability. The project implements secure communications to: (1) allow smart meter customers to view their electricity consumption data whenever they want through the Smart Meter Texas (SMT) data exchange, and (2) allow CPE to effectively visualize and operate the distribution system. As a transmission and distribution service provider, CPE provides metering data to retail energy providers (REPs) through the SMT data exchange. The billing data and customer systems enable REPs to offer information feedback, new pricing programs, and other electric service options to customers. The project also deploys a more advanced distribution management system and automated feeder switching, that reduces operational costs and improves service reliability.
Smart street lighting	Procurement	Currently in effect [city-wide]	Yes	All streetlights are retrofitted with photocell technology in order to deliver lighting based on need instead of being set on a timer.

**Is your city taking action on SMART Emergency Response?**

Yes

**I1.2a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Real-time information on rainfall and/or temperature	Program	Currently in effect [city-wide]	Yes	The Harris County Flood Control District's Flood Warning System (FWS) measures rainfall amounts and monitors water levels in bayous and major streams on a real-time* basis to inform Houstonians of dangerous weather conditions. The system relies on 133 gage stations strategically placed throughout Harris County bayous and their tributaries. The stations contain sensors that transmit valuable data during times of heavy rainfall and during tropical storms and hurricanes. Some gages also measure wind speed and direction, barometric pressure, air temperature, road temperature and humidity. <a href="http://www.hcfdc.org/me_harriscountyfws.html">http://www.hcfdc.org/me_harriscountyfws.html</a>
Real-time information on flooding, heat, etc.	Program	Currently in effect [city-wide]	Yes	The Harris County Flood Control District's Flood Warning System (FWS) measures rainfall amounts and monitors water levels in bayous and major streams on a real-time* basis to inform Houstonians of dangerous weather conditions. The system relies on 133 gage stations strategically placed throughout Harris County bayous and their tributaries. The stations contain sensors that transmit valuable data during times of heavy rainfall and during tropical storms and hurricanes. Some gages also measure wind speed and direction, barometric pressure, air temperature, road temperature and humidity. <a href="http://www.hcfdc.org/me_harriscountyfws.html">http://www.hcfdc.org/me_harriscountyfws.html</a>

**I1.3**

**Is your city taking action on improving information communication technology connectivity?**

Yes

**I1.3a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Increasing wireless hotspots	Program	Currently in effect [city-wide]	Yes	WeCAN is a partner with the City of Houston to expand a citywide WiMax and WiFi network that will enable free community and retail broadband access for 300,000 residents living in underserved communities as well as interconnect 5,000 traffic signals and school zone flashers, over 500 remote offices and facilities, 500,000 water meter accounts, 1,500 field workers, and over 1,500 electronic parking pay stations. This municipal broadband network will enable the City to save millions of dollars each year through reduced commercial broadband service costs. <a href="http://www.wecanhouston.org/">http://www.wecanhouston.org/</a>
Increasing mobile phone coverage		Currently in effect [city-wide]	Yes	WeCAN is a partner with the City of Houston to expand a citywide WiMax and WiFi network that will enable free community and retail broadband access for 300,000 residents living in underserved communities as well as interconnect 5,000 traffic signals and school zone flashers, over 500 remote offices and facilities, 500,000 water meter accounts, 1,500 field workers, and over 1,500 electronic parking pay stations. This municipal broadband network will enable the City to save millions of dollars each year through reduced commercial broadband service costs. <a href="http://www.wecanhouston.org/">http://www.wecanhouston.org/</a>
Increasing access to internet connection		Currently in effect [city-wide]	Yes	WeCAN is a partner with the City of Houston to expand a citywide WiMax and WiFi network that will enable free community and retail broadband access for 300,000 residents living in underserved communities as well as interconnect 5,000 traffic signals and school zone flashers, over 500 remote offices and facilities, 500,000 water meter accounts, 1,500 field workers, and over 1,500 electronic parking pay stations. This municipal broadband network will enable the City to save millions of dollars each year through reduced commercial broadband service costs. <a href="http://www.wecanhouston.org/">http://www.wecanhouston.org/</a>
Increasing public access to computers	Program	Currently in effect [city-wide]	Yes	Citizens can check out laptop at the Houston Public libraries.

#### I1.4

Please detail any other actions your city is taking on ICT.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Ozone Mapping Tool	Program	Currently in effect [city-wide]	Yes	Residents of the greater Houston area can track ozone levels through the Houston Clean Air Network. Sponsored by a three-year \$450,000 grant from Houston Endowment, this website provides real-time air quality updates using maps of the region. The Houston Clean Air Network (CAN) is a collaboration between local non-profits, businesses, researchers, and government agencies who share the goal of protecting public health from air pollution. CAN members are working together to reduce emissions by providing tools for understanding Houston's air pollution challenges. <a href="http://houstoncleanairnetwork.org">http://houstoncleanairnetwork.org</a>

**Page: Finance**

**F0.1**

**Has the city sought funding from the Clean Development Mechanism (CDM) for low carbon initiatives?**

No

**F0.2**

**Has the city sought funding for any energy efficiency/low carbon/renewable energy project(s) for a multi-lateral funding donor (ie World Bank, Asia Development Bank, etc)?**

No

**F0.3**

**Has the city established a fund to invest in energy efficiency, renewable energy or carbon reduction projects?**

No

**F0.4**



**What proportion of the city's GDP is accounted for by the following sectors (in % city GDP)?**

<b>Sectors</b>	<b>% of city GDP</b>
Service - Finance	17%
Service - Business	16%
Service - Creative industries and film	2%
Light industry/Manufacturing	23%
Heavy industry	19%
Tourism	3%
Education	3%
Health	4%
Agriculture	4%
Public sector	9%

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**F0.5**

**What is the financial condition of the water supply utility?**

Revenue from tariffs generally covers all operating costs

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**F0.6**

**Does the city have its own credit rating?**

Yes

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**F1.0**

**Is your city taking action on low carbon infrastructure finance?**

Yes

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**F1.0a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Loans				Not applicable
Bonds	Program	Currently in effect and being piloted	Yes	The City will be using Qualified Energy Conservation Bonds (QECBs) to fund energy efficiency work in the City's libraries (\$8 million tranche) and is considering using QECBs for additional work in 2013/2014.
Revolving funds				Not applicable
Guarantees				Not applicable
Fiscal incentives				Not applicable
Green mortgages				Not applicable
Multilateral/Bilateral climate funds				Not applicable
Venture capital/Angel funds				Not applicable
Energy service company (ESCO) financing	Program	Currently in effect at a significant scale across most of the city	Yes	Through performance contracting, a total of 297 City facilities are expected to achieve guaranteed energy use reductions of 30%, saving over 22 million kWh of electricity every year, with paybacks of, on average, less than ten years. Both Siemens and Schneider Electric worked on the performance contracting.
Adaptation infrastructure finance	Policy / Regulation			Not applicable
Clean development mechanism (CDM)/Joint implementation (JI)				Not applicable
City carbon trading scheme				Not applicable

F1.1

Is your city taking action on supporting clean tech clusters?

No

F1.1a

Please select the actions you are taking and provide details for each action.

Action	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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## F1.2

Is your city taking action on promotion of green industries?

Yes

### F1.2a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Green manufacturing	Program	Still under consideration or awaiting final authorization	Yes	The City is working on its innovative recycling initiative One Bin for All. One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating trash as valuable assets, dramatically increasing recycling using game changing technologies. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Houston has a well-established industrial and energy base. This high-profile development will provide incentives for networks to form around newly separated materials that will be available as feedstocks. One Bin for All recognizes value from assets that are now being discarded, and stimulates associated growth in companies in materials management. By having access to more volume, One Bin for All will separate material into new commodities. With larger volumes of materials, new feedstocks will be created, thereby extracting maximum value from material to create new products. For example, using DOE funded research, a scalable and commercial process can occur in which a catalyst transforms discarded paper products

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				directly into gasoline or diesel for use in standard internal combustion engines. In addition, access to all discarded glass will spark glass recyclers to build facilities in Houston.
Promoting green industry clusters				

**F1.3**

Please detail any other actions your city is taking on finance.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description

**Page: Outdoor Lighting**

**L0.1**

Does the city monitor electricity use for street lighting?

No

**L0.2**

How much of the city's area is covered by street lighting?

Area	Unit

Area	Unit
85	%

**L0.3**

What is the proportion of each type of luminaires (lightbulbs) used in street lighting across the city?

Lighting types	Percent
Incandescent	0%
Sodium discharge	99%
LED	1%
Other	0%

**L1.0**

Is your city taking action on reducing emissions from street lights?

Yes

**L1.0a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
More efficient luminaires (e.g. LED)	Program	Currently in effect [city-wide]	Yes	CenterPoint Energy owns the streetlights within the city, while the City of Houston pays for the usage of the streetlights and electricity based on a tariff rate. The City has directed CenterPoint to use full cut-off luminaires to reduce light pollution.
Reduce number of street lights				Not applicable

**L1.1**

**Is your city taking action on introducing smart street lighting?**

Yes

**L1.1a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Timed lighting				Not applicable
Computerized lighting				Not applicable
Sensor-based lighting	Program	Currently in effect [city-wide]	Yes	All streetlights are retrofitted with photocell technology in order to deliver lighting based on need.
Solar powered streetlights				Not applicable

**L1.2**

**Please detail any other actions your city is taking on outdoor lighting.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
LED Streetlights Downtown	Program	Currently in effect and being piloted	Yes	Central Houston, Downtown District, City of Houston & CenterPoint Energy have a pilot LED street light program downtown.
LED Traffic Signals	Program	Currently in effect [city-wide]	Yes	The City has completed replacing the incandescent bulbs at all of its 2,450 signalized intersections with LEDs, which are 75% more energy efficient. In addition, the City is now realizing over \$3.6 million a year in savings.

**WST0.1**

**How much waste does the city generate (kg/person/day)?**

Waste Types	Answer
Municipal waste	2
Commercial/Industrial waste	1
Construction and demolition waste	1
Hazardous waste	1

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**WST0.2**

**What is your municipal waste breakdown?**

Waste Types	Percentage
Organics	27%
Metals	9%
Wood	7%
Glass	5%
Textiles	8%
Plastics	12%
Paper and cardboard	29%
Fines (soil, dust etc)	0%
Other	3%

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**WST0.3**

**Does the city have any formal waste collection?**

Yes

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**WST0.4**

**Do you have any informal sector waste collection?**

Yes

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**WST0.5**

**Percentage of total waste collected?**

7%

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**WST0.6**

**Does the city have recyclables collection for single-family households?**

Yes

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**WST0.7**

**Does the city have recyclables collection for multi-family buildings?**

No

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**WST0.8**



**Does the city have recyclables collection for commercial establishments?**

No

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**WST0.9**

**Does the city have organics collection for single-family households?**

No

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**WST0.11**

**Does the city have organics collection for multi-family buildings?**

No

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**WST0.12**

**Does the city have organics collection for commercial establishments?**

No

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**WST0.13**

**Does the city have collection fees for single-family households?**

No

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**WST0.14**

**Does the city have collection fees for multi-family buildings?**

No

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**WST0.15**

**Does the city have collection fees for commercial establishments?**

No

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**WST0.16**

**Does the city have a solid waste management master plan?**

Yes

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**WST0.17**

**Do the landfills have landfill gas (LFG) management?**

Yes

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**WST0.18**

**Is the city generating energy from landfill gas (LFG)?**

Yes

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**WST0.19**

**Provide a breakdown of current municipal waste treatment by method:**

Waste Treatment Method	Answer
Re-use	1%
Recycling / composting	18%

Waste Treatment Method	Answer
Waste to energy	0%
Landfill	81%
Other	

### WST1.0

Is your city taking action on residential waste prevention/minimization?

Yes

### WST1.0a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Pay as you throw				Not applicable
Disincentives or bans on certain waste (e.g., plastic bags)				Not applicable
Outreach / informative programmes	Program	Currently in effect at a significant scale across most of the city	Yes	Community outreach programs include presentations to schools, neighborhood associations, business groups and more. The Solid Waste Department has mascots to represent recycling and encourage kids to get involved. The City has also participated in an incentive program called Recycle Bank that offers rewards in the form of coupons to residents for recycling.
Reducing packaging				Not applicable
Waste collection fees				Not applicable

WST1.1

Is your city taking action on residential recycling and reutilization?

Yes

WST1.1a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Statys	Do you plan to expand this action in the future?	Action Description
Re-use schemes	Program	Currently in effect [city-wide]	Yes	The City operates a couple of reuse centers for building materials and some hazardous materials (ex. paint) in good condition. In the future similar locations could be set up in other parts of the city. <a href="http://www.houstontx.gov/solidwaste/reuse.html">http://www.houstontx.gov/solidwaste/reuse.html</a>
Source separation policies	Program	Still under consideration or awaiting final authorization	Yes	The City is working on a new innovation that would do the opposite of source separation, minimizing all separation, while achieving high recycling rates and diversion. One Bin for All would allow residents to discard all materials in one bin, treating trash as valuable assets, dramatically increasing recycling using game changing technologies. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Proven technologies (shredders, sensors, density separators and optical scanners) have been used previously in the waste, mining, or refining industries, but combined in a new process will yield a much higher recycling rate. This innovation will reduce greenhouse gas (GHG) emissions and improve air quality, provide an easy-to-use program for residents, save money and increase revenues. In the meantime, while One Bin for All is receiving approvals, etc., the City will continue to expand its single-stream recycling program (the bins can be used as the One Bin for the program in the future, so there will be no sunk costs). The program should expand to 30k households in 2013.
Municipal recycling points or centres for residents	Program	Currently in effect [city-wide]	Yes	The City currently operates 13 drop-off locations for residents to bring recyclable materials.

Actions	Lever	Scale and Statys	Do you plan to expand this action in the future?	Action Description
Incentives for recycling	Program	Currently in effect and being piloted	No	The City has also participated in an incentive program called Recycle Bank that offers rewards in the form of coupons to residents for recycling.
Electronic waste recycling	Program	Currently in effect [city-wide]	Yes	The City currently collects ewaste at three permanent locations, and also hosts drop-off events for different areas through out the year. The City also responsibly e-cycles all of its municipal waste.
Composting in house				Not applicable

#### WST1.2

Is your city taking action on residential organic waste management/composting?

Yes

#### WST1.2a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Re-use schemes				Not applicable
Source separation policies	Policy / Regulation	Currently in effect [city-wide]	No	Residents are required to place yard trimmings in city approved compostable bags for separate collection. In addition, every other month residents are provided collection of tree waste only on their heavy trash (bulky item) collection day. These materials are composted and mulched using a contracted private firm.
Municipal recycling	Program	Currently in	Yes	The City operates drop-off locations where residents may bring tree debris for disposal

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
points or centres for businesses		effect [city-wide]		in between collection days.
Incentives for organics treatment				Not applicable

### WST1.3

Is your city taking action on commercial waste prevention/minimization?

Yes

### WST1.3a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Pay as you throw				Not applicable
Disincentives or bans on certain waste (e.g., plastic bags)				Not applicable
Outreach / informative programmes				Not applicable
Reducing				Not applicable

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
packaging				
Waste collection fees	Program	Currently in effect and being piloted	Yes	For a fee, the city currently offers collection of recycling to small businesses near residential collection routes. This is a new program currently being piloted in a few areas with the intent to grow the program to more areas over time. <a href="http://www.houstontx.gov/solidwaste/business_recycling.html">http://www.houstontx.gov/solidwaste/business_recycling.html</a>

#### WST1.4

Is your city taking action on commercial waste recycling and reutilization?

Yes

#### WST1.4a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Re-use schemes				Not applicable
Source separation policies				Not applicable
Municipal recycling points or centres for businesses				Not applicable
Incentives for recycling				Not applicable
Electronic waste recycling				Not applicable

#### WST1.5

**Is your city taking action on commercial organic waste management/composting?**

No

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**WST1.5a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.6**

**Is your city taking action on industrial waste prevention/minimization?**

No

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**WST1.6a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.7**

**Is your city taking action on industrial waste recycling and reutilization?**

No



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**WST1.7a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.8**

**Is your city taking action on construction and demolition waste prevention/minimization?**

Yes

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**WST1.8a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Waste management plans on construction sites	Program	Currently in effect at a significant scale across most of the city		The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. In the LEED Rating System, there are two credits that relate to construction waste management. Many projects in the community have achieved this credit.
Construction waste recycling/reuse	Program	Currently in effect at a significant scale across most of the city		The City has a Green Building Resolution, which sets a target of LEED-Silver certification for new construction, replacement facilities and major renovations of city of Houston-owned buildings and facilities with more than 10,000 square feet of occupied space. In the LEED Rating System, there are two credits that relate to materials reuse. Many projects in the community have achieved this credit.
Construction waste				Not applicable

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
permitting				
Reduce dumping of waste	Program	Still under consideration or awaiting final authorization	Yes	The City has convened an Illegal Dumping Task Force to strategize ways to combat illegal dumping.
Promoting C&D waste re-use	Program	Currently in effect [city-wide]	Yes	The city currently operates one location for the collection of gently used building materials that are then made freely available to non-profit organizations for reuse. <a href="http://www.houstontx.gov/solidwaste/reuse.html">http://www.houstontx.gov/solidwaste/reuse.html</a>

#### WST1.9

**Is your city taking action on agricultural waste prevention/minimization?**

No

#### WST1.9a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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#### WST1.11

**Is your city taking action on agricultural waste recycling and composting?**

No

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**WST1.11a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.12**

**Is your city taking action on landfill management?**

No

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**WST1.12a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.13**

**Is your city taking action on waste collection and transport: optimizing waste collection logistics?**

Yes

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**WST1.13a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Single waste stream collection	Program	Currently in effect and being piloted	Yes	The city currently offers curbside single stream recycling to a portion of the residents receiving city solid waste collection services. Another fraction receive dual stream curbside recycling collection and the remainder do not have curbside recycling collection. The intent of the City is to implement One Bin for All and increase its diversion to 75%, providing all citizens the ability to participate in recycling/reuse.
Automated (vacuum) waste collection				Not applicable
Sectoral consolidated waste collection	Program	Currently in effect [city-wide]	Yes	Transfer stations
Geographical franchising (if private)				Not applicable

#### WST1.14

Is your city taking action on waste collection and transport: segregating collection?

No

#### WST1.14a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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**WST1.15**

**Is your city taking action on waste collection and transport: improving the CO2e efficiency of waste collection vehicles?**

Yes

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**WST1.15a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Introduce low carbon collection vehicles	Procurement	Currently in effect at a significant scale across most of the city	Yes	Solid waste has 10 hybrid trucks in its fleet.

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**WST1.16**

**Is your city taking action on waste collection and transport: reduce CO2e intensity of long-haul transport?**

No

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**WST1.16a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
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**WST1.17**

**Is your city taking action on wastewater treatment: improving efficiency?**

No

WST1.17a

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
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WST1.18

Please detail any other actions your city is taking on waste.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Innovative Recycling program	Program	Still under consideration or awaiting final authorization	Yes	One Bin for All is a revolutionary idea for residents to discard all materials in one bin, treating "trash" as valuable assets, dramatically increasing recycling using game changing technologies. This cost-neutral, technological innovation is a paradigm shift, changing how people think about waste and recycling. The concept of "trash" will be extinct and replaced by an understanding that all discarded material has value and can be recycled. Houston will apply proven technologies and new processes, redefining municipal solid waste from a liability to a valuable asset. This first-of-its-kind innovation uses technology in a way that has never been done before. This approach has the potential for cities across the globe to reduce greenhouse gas emissions, save money and create high value materials. Houston's innovation will: • Provide every residence with curbside One Bin for All services; • Decrease the volume of waste sent to landfills; • Reduce air pollution; and, • Manage waste and recycling costs. Houston will divert up to 75% of its waste. Houston has evidence the technology can work, significantly increasing its recycling rate at a price that is affordable. For more information, please visit <a href="http://www.huffingtonpost.com/annise-parker/mayors-challenge-houston-_b_2711153.html?utm_hp_ref=fb&amp;src=sp&amp;comm_ref=false">http://www.huffingtonpost.com/annise-parker/mayors-challenge-houston-_b_2711153.html?utm_hp_ref=fb&amp;src=sp&amp;comm_ref=false</a> .

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**FA0.1**

**How many metric tonnes of CO2e are generated annually from food consumption within the city?**

223000

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**FA0.2**

**What proportion of food consumed within the city is grown within the administrative boundaries of the city?**

3%

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**FA0.3**

**What is the city's budget for food-related policies and programs? (US\$)**

350000

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**FA0.4**

**What percentage of the city land is devoted to food production?**

7%

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**FA0.5**

**Does the city have a resilience or self-sufficiency target for food?**

Yes

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**FA0.6**

**Does the city have a target for reducing food miles, or encouraging local food production?**

Yes

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**FA1.0**

**Is your city taking action on encouraging sustainable agriculture?**

Yes

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**FA1.0a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Farmers' markets	Program	Currently in effect at a significant scale across most of the city	Yes	Farmer's markets have gained popularity in Houston, including the City Hall Farmer's Market, the Eastside Street Farmer's Markets, and the Rice University Farmer's Market. <a href="http://www.visithoustontexas.com/shopping/farmers-markets/">http://www.visithoustontexas.com/shopping/farmers-markets/</a>
Local farmer cooperatives	Program	Currently in effect at a significant scale across most of the city	Yes	The largest farmer's cooperative is Central City Co-op. <a href="http://www.centralcityco-op.com/index.html">http://www.centralcityco-op.com/index.html</a>
Community gardens or allotments	Program	Currently in effect and being piloted	Yes	In November 2012, the City launched the Urban Grows initiative. Urban Grows, part of the City of Houston's Healthy Houston initiative, aims to help communities build vegetable



Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				gardens, farms and orchards on vacant land in areas with poor access to healthy fresh foods, often referred to as food deserts. The City of Houston will provide lots through its LARA program (Land Assemblage Redevelopment Authority), which works to redevelop tax-delinquent and abandoned properties. Community members, partnering with local non-profits, foundations or churches, will then work to transform these vacant lots into usable, productive and attractive green spaces. Urban Grows is the first initiative launched as part of Mayor Parker's new program, Healthy Houston, which is designed to reduce obesity and increase healthy eating and exercise. Healthy Houston will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage the development of sustainable food systems and promote recreational opportunities. Urban Grows will: <ul style="list-style-type: none"> <li>• Encourage urban agriculture in neighborhoods, utilizing vacant City property</li> <li>• Improve access to healthy, affordable and locally produced food for all neighborhoods</li> <li>• Support education regarding the benefits of sustainable agriculture</li> </ul> Urban Grows will complement the City's existing efforts, including the launch of the City Hall Farmers Market and farmers markets at the City's multi-service centers; new vegetable container gardens downtown and throughout the City; and a Grocery Access Task Force that works with grocers on providing economic tools and incentives to help spur more supermarket and grocery development in areas where they are needed.
Commercial urban food production	Program	Currently in effect and being piloted	Yes	The City of Houston has employee gardens at Tranquillity Park, the Bob Lanier Building, the Houston Permitting Center, and some health department buildings. Buildings have employee garden consortiums to maintain the raised beds or container gardens.
Promote organic/sustainable farming				The City Hall Farmer's market brings in local farmers that use organic or sustainable farming practices.
Promote reduction in application of pesticides and chemical fertilizers				Not applicable
Rooftop gardening	Program	Still under consideration or awaiting final authorization	Yes	The City is considering having a demonstration rooftop garden.
Vertical farming				Not applicable

FA1.1

Please detail any other actions your city is taking on food and agriculture.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Increasing Food Access	Program	Currently in effect and being piloted	Yes	The Houston Grocery Access Task Force, convened by Children at Risk, the City of Houston, and The Food Trust has developed a draft roadmap for improved grocery access in Houston and Texas. In response to the work of the task force, the City of Houston has created a pilot program that uses an existing economic development tool to incentivize healthy food retail development or expansion in four target neighborhoods currently underserved by grocery stores. <a href="http://www.healthyfoodaccess.org/policy-efforts/texas">http://www.healthyfoodaccess.org/policy-efforts/texas</a> <a href="http://www.greenhoustontx.gov/20130205.html">http://www.greenhoustontx.gov/20130205.html</a>
Healthy Houston	Program	Currently in effect [city-wide]	Yes	In September 2012, Mayor Annise Parker announced the launch of Healthy Houston, an initiative designed to reduce obesity and increase healthy eating and exercise. The initiative will promote programs, policies and actions designed to reduce food deserts, promote the availability of locally-grown foods, encourage the development of sustainable food systems and promote recreational opportunities. To lead the initiative, the Mayor has created a Healthy Houston Task Force. They will work to recommend and implement specific actions to reduce the incidence of obesity and its health and economic impacts in the City of Houston, including: <ul style="list-style-type: none"> <li>• Encouraging urban agriculture in community, school, backyard and rooftop gardens and, where feasible, on City property</li> <li>• Improving access to healthy, affordable and locally produced food for all neighborhoods</li> <li>• Supporting education regarding the physical and mental health risks of obesity and the benefits of sustainable agriculture, using locally produced food, consuming fresh fruits and vegetables, infant breastfeeding, providing healthy meals in our schools, physical activity and exercise, and maintaining a healthy weight</li> <li>• Enabling programs that increase physical activity and exercise in schools, at work, and in communities, including those that provide safe playgrounds and parks, pedestrian-friendly walkways, bicycle paths and other recreational opportunities</li> </ul> <a href="http://www.houstontx.gov/mayor/press/20120912.html">http://www.houstontx.gov/mayor/press/20120912.html</a>

Page: Water.

W0.1

How many metric tonnes of CO2e are generated annually from supplying water?

146470

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**W0.2**

What are the sources of the city's water supply?

Water supply sources	Percentage
Surface water	86%
Ground water	14%
Desalinated seawater	
Re-cycled water	

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**W0.3**

How much water is used in the city per day (for all uses)? (in millions of liters per day)

2297

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**W0.4**

How is water used? Please indicate percentage of each end user.

End Users	Percentage
Domestic	
Commercial	
Municipal	
Industrial	
Agriculture	
Other	

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**W0.5**

**What percent of domestic users have a metered supply?**

100%

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**W0.6**

**Is metering mandatory for domestic users?**

Yes

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**W0.7**

**What percent of industrial and commercial users have a metered supply?**

100%

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**W0.8**

**Is metering mandatory for industrial and commercial users?**

Yes

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**W0.9**

**What volume of wastewater is treated per day (on average)? (in millions of liters per day)**

821

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**W0.11**

**What percent of the population has access to safe drinking water?**

100%

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**W0.12**

**What percent of the population has access to adequate sanitation?**

100%

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**W0.13**

**How is storm and waste water collected and treated?**

The Storm Water Management Program (SWMP) supports the City of Houston in its implementation of citywide storm water drainage improvements and management practices. Specific work efforts within the SWMP include:

- The implementation of storm drainage improvements to the Texas Medical Center (TMC) and various neighborhood storm drainage improvement projects
- Floodplain Management
- Support of the City's participation in the National Flood Insurance Program (NFIP)
- The City of Houston Comprehensive Drainage Plan (CDP)

The SWMP designs and constructs Capital Improvement Projects (CIP) in order to provide increased levels of flood protection for Houston and its citizens.

<http://www.swmp.org/>

WASTEWATER FACILITIES OPERATIONS AND MAINTENANCE is charged with protecting public health and the environment by providing wastewater services through treatment of wastewater generated by residential, commercial and industrial customers. To ensure routine daily activities can be carried out by our citizens, the branch operates and maintains 40 wastewater treatment plants treating an average of 277 million gallons per day, and 420 lift stations over a 650 square mile region. The system is closely managed through the City's Supervisory Control and Data Acquisition (SCADA) central monitoring system in order to meet all federal and state regulatory requirements and most important to provide 24-hour per day wastewater service to our customers.

<http://www.publicworks.houstontx.gov/utilities/wwops.html>

Houston has a separate storm water and waste water system. Wastewater is collected in a separate pipe system and treated at wastewater treatment plants. Storm water is not collected, and the system is designed to drain to the bayous and eventually to Galveston Bay as quickly as possible. Storm water is not treated.

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**W1.0**

**Is your city taking action on increasing sustainable water supply?**

Yes

**W1.0a**

**Please select the actions you are taking and provide details for each action.**

<b>Actions</b>	<b>Lever</b>	<b>Scale and Status</b>	<b>Do you plan to expand this action in the future?</b>	<b>Action Description</b>
Rainwater harvesting	Program	Currently in effect [city-wide]	Yes	The City organizes a half-price rain barrel and compost bin sale every year in the fall.
Mandatory connection for reclaimed water		Currently in effect [city-wide]		Not applicable
Connection fees for new buildings	Policy / Regulation	Currently in effect [city-wide]	Yes	Code enforcement has impact fees for connecting buildings to the City's water and sewer sytem.
Reduce leakages in water supply	Program	Currently in effect [city-wide]	Yes	The Utility Maintenance Branch of Public Works and Engineering is responsible for maintaining 14,000 miles of water distribution and wastewater collection lines. The following services are provided for City of Houston residents: -Repair of water breaks on public properties. -Relocation of water meters and service lines to access new and larger water mains installed in the streets. - Investigation of low water pressure. -Fire hydrant repair, replacement and preventive maintenance. -Investigation of sanitary sewer odors. -Dye testing, smoke testing, and removal of sanitary sewer stoppages and overflows. -Cleaning and repair of sanitary sewer lines. - Restoration of public and private property after the repair of water and sewer lines. <a href="http://www.publicworks.houstontx.gov/utilities/utmaint.html">http://www.publicworks.houstontx.gov/utilities/utmaint.html</a>
Water recycling or reclamation	Program	Currently in effect and being piloted	Yes	Two golf courses take water from water treatment plants and use it for irrigation. Also, there are commercial/industrial treated water users who make great efforts to be water efficient.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Optimising delivery fuel mix of water supply	Program	Currently in effect at a significant scale across most of the city		Currently, green power accounts for 35% of the City's electricity usage with a goal of achieving 50% in 2013.
Optimising delivery mode of water consumption	Program	Currently in effect [city-wide]	Yes	Under Public Works & Engineering division of Utility Maintenance, water distribution and transmission pipes are upgraded per the asset management program.

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**W1.1**

**Is your city taking action on improving the efficiency of water consumption?**

Yes

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**W1.1a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future ?	Action Description
Incentives to introduce water efficiency measures	Incentive / Disincentive	Still under consideration or awaiting final authorization	Yes	In July 2012, Mayor Annise Parker announced the formation of a Water Conservation Task Force. Following the drought in 2011, and the mandatory water conservation measures imposed that summer, the Mayor is actively looking at long-term water supply and water conservation solutions. The Task Force is reviewing water supply options and conservation measures for Houston, and looking at other ideas to diversify the City's water supply, including recycled water for irrigation, greywater use, rainwater harvesting and desalination among other ideas. While surface water storage has recently recovered, the City must plan for the future and continue to encourage water customers to practice and further develop water conservation efforts. The Task Force will develop a report which will include recommendations for best management practices and conservation goals for the City.
Bans/restrictions on irrigation/hosepipes			Yes	During states 2-4 of the Water Shortage and Emergency Plan, water shortage restrictions are put in place.
Standards for water use in new buildings	Policy / Regulation	Currently in effect [city-wide]	Yes	Water use in new buildings is per the 2006 Uniform Plumbing Code and the Houston Amendments to the 2006 UPC. Standards also follow state regulations on low-flow toilets.
Standards for connection to recycle water network	Policy / Regulation	Currently in effect [city-wide]	Yes	Standards to use reclaimed water have been included in the Houston Amendments to the adopted 2006 Uniform Plumbing Code Ch. 16. Sec 1601.1.2. 1601.1.2 Allowable Use of Alternate Water. Where approved by the Authority Having Jurisdiction, alternate water sources (reclaimed (recycled) water, rainwater, gray water and onsite treated nonpotable water) shall be permitted to be used in lieu of potable water for the applications identified in this chapter. <a href="http://documents.publicworks.houstontx.gov/documents/divisions/planning/enforcement/06_upc_amendments.pdf">http://documents.publicworks.houstontx.gov/documents/divisions/planning/enforcement/06_upc_amendments.pdf</a>
Water efficient appliances	Program	Currently in effect at a significant scale across most of the city	Yes	Green Building Resource Center educates the public on water efficient appliances. <a href="http://www.codegreenhouston.org/">http://www.codegreenhouston.org/</a>
Smart metering	Program	Currently in	Yes	The City of Houston was the first major city in the U.S. to use in ground automated water meter reading



Actions	Lever	Scale and Status	Do you plan to expand this action in the future ?	Action Description
		effect [city-wide]		(AMR) technology. This technology enables customers to receive instantaneous feedback of water use. Utility company managers from all over the country come to Houston to inspect this state-of-the-art payment processing equipment and the Automatic Meter Reading Program.
Water use audits				Not applicable

**W1.2**

**Is your city taking action on stormwater management?**

Yes

**W1.2a**

**Please select the actions you are taking and provide details for each action.**

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Streetscapes	Policy /	Currently in	Yes	Chapter 13 "STORMWATER QUALITY DESIGN REQUIREMENTS" of the Infrastructure Design

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
with retention / detention mechanisms	Regulation	effect [city-wide]		Manual has the design criteria for permanent storm water pollution prevention procedures and controls to minimize impacts for new development and decrease impacts for redevelopment. The City of Houston's approved Low Impact Development (LID) infrastructure designs are included in the chapter. In addition, there is a drainage fee on properties within the City limits that is based on the amount of impervious surface within each parcel. Increasing the amount of pervious cover, adding additional detention, or using approved LID best management practices (e.g., green roofs, bio-retention, or porous pavement) can reduce the monthly drainage fee for that property.
Relief canals/new grey pathways for stormwater distribution	Program	Currently in effect at a significant scale across most of the city	Yes	The Mary Gibbs and Jesse H. Jones Greenway is a walking trail and waterway through the main Lake Plaza and Houston Zoo parking area. The bayou swale-style basin, full of lush plantings, collects water from the plaza, and filters pollutants before the water flows into Brays Bayou. It also holds water during heavy rainfall to reduce flooding and offers an enhanced wildlife habitat. From there, another greenway trail takes walkers through the golf course to Bayou Parkland, an eighty-acre urban forest separated from the formal center of the park by North and South MacGregor Ways. During the 1990s and 2000s, it underwent a revitalization that included construction of walking trails, boardwalks, and multi-use outdoor pavilion. Accessibility to Bayou Parkland will increase with the new Bill Coats Bike Bridge over Brays Bayou scheduled to open in late summer 2012. It will connect cyclists and pedestrians to trails along the bayou on both sides, giving visitors convenient walking access to Bayou Parkland and its amenities from the main body of the park. <a href="http://houstonhistorymagazine.org/wp-content/uploads/2013/02/vol-9-no-3-final-optimized.pdf">http://houstonhistorymagazine.org/wp-content/uploads/2013/02/vol-9-no-3-final-optimized.pdf</a> The Greens Bayou Wetlands Mitigation Bank is a 1,400-acre wetland project located in northeast Harris County. The Bank project combines wetland creation, mitigation and natural stormwater runoff treatment in a unique and highly beneficial manner. The design is the result of input from a team comprised of some of the most renowned experts in the fields of wetland ecology and water quality. Two phases of subdivisions have been completed, and the design calls for at least six more phases, which will provide for the restoration and preservation of the remaining 1,200 acres. <a href="http://www.hcfd.org/greensbayou_wmb.html">http://www.hcfd.org/greensbayou_wmb.html</a> On Friday, October 27, 2006, a milestone was marked for the ecology of the Brays Bayou watershed. A newly created wetland environment encompassing 3.5 acres was unveiled in Mason Park, located in eastern Houston at the intersection of South 75th and Tipps Streets. The Tidal Freshwater Wetlands project was undertaken by the Texas Coastal Watershed Program, under the auspices of Texas Cooperative Extension/Texas Sea Grant. <a href="http://www.houstontx.gov/parks/masonparkwetland.html">http://www.houstontx.gov/parks/masonparkwetland.html</a> <a href="http://glendale.directrouter.com/~cwporg/images/stories/WTM/cwp_brays_finalpost.pdf">http://glendale.directrouter.com/~cwporg/images/stories/WTM/cwp_brays_finalpost.pdf</a>
Increasing capacity of				ReBuild Houston is the City of Houston's initiative to improve the quality of life and mobility for residents of the city by rebuilding our drainage and street infrastructure. To support the initiative, the

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
existing stormwater drains/systems				city has established a dedicated, pay-as-you-go fund to maintain the infrastructure, and to plan upgrades to meet future needs as the city grows. ReBuild Houston is a direct result of City of Houston voters approving Proposition One on November 2, 2010. A 10- year planning cycle will identify new projects based on need, prioritizing the worst needs first. ReBuild Houston will help: -Reduce street flooding -Improve mobility -Reduce structural flooding • Rebuild Houston is now in its second year. In its first year, the City completed a total of 16 major street or drainage improvement projects and 12 local drainage projects, as well as continuing or starting another 14 major projects and 4 more local drainage projects. The City resurfaced 136 lane miles of asphalt streets, cleaned 75 miles of storm sewers and re-graded 277 miles of road ditches. To date, the City has already invested approximately \$180 million in improvements to its infrastructure since the program began. <a href="http://www.rebuildhouston.org/">http://www.rebuildhouston.org/</a>
Permeable paving	Program	Currently in effect and being piloted	Yes	Public Works & Engineering have permeable paving pilot installations on Rice University Campus sidewalks and parking lots and at Cliff Tuttle Park.
Storm water retention / detention in new developments	Policy / Regulation	Currently in effect [city-wide]	Yes	Chapter 13 “STORMWATER QUALITY DESIGN REQUIREMENTS” of the Infrastructure Design Manual has the design criteria for permanent storm water pollution prevention procedures and controls to minimize impacts for new development and decrease impacts for redevelopment. The City of Houston's approved Low Impact Development (LID) infrastructure designs are included in the chapter. In addition, there is a drainage fee on properties within the City limits that is based on the amount of impervious surface within each parcel. Increasing the amount of pervious cover, adding additional detention, or using approved LID best management practices (e.g., green roofs, bio-retention, or porous pavement) can reduce the monthly drainage fee for that property.
Incentives for rain gardens and/or cisterns	Program	Currently in effect [city-wide]	Yes	The City organizes a half-price rain barrel and compost bin sale every year in the fall.
Green roofs	Policy / Regulation	Currently in effect [city-wide]	Yes	Chapter 13 “STORMWATER QUALITY DESIGN REQUIREMENTS” of the Infrastructure Design Manual has the design criteria for permanent storm water pollution prevention procedures and controls to minimize impacts for new development and decrease impacts for redevelopment. The City of Houston's approved Low Impact Development (LID) infrastructure designs are included in the chapter. In addition, there is a drainage fee on properties within the City limits that is based on the amount of impervious surface within each parcel. Increasing the amount of pervious cover, adding additional detention, or using approved LID best management practices (e.g., green roofs, bio-retention, or

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
				porous pavement) can reduce the monthly drainage fee for that property.

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**W1.3**

**Is your city taking action on energy from wastewater treatment?**

No

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**W1.3a**

Please select the actions you are taking and provide details for each action.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description

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**W1.4**

Please detail any other actions your city is taking on water.

Actions	Lever	Scale and Status	Do you plan to expand this action in the future?	Action Description
Conducting Water Quality Assessments	Program	Currently in effect [city-wide]	Yes	<p>The City of Houston is a partnering agency under the Texas Clean Rivers Program, locally managed by the Houston-Galveston Area Council. All of the data that the City collects is used by the Houston-Galveston Area Council and the Texas Commission on Environmental Quality to conduct water quality assessments for water bodies throughout Houston, Harris County, and the surrounding region. Although internally, the City does not keep “statistics,” the City reviews the data and compiles lists of sites where the City frequently find elevated levels of bacteria. The bureau investigates these water bodies in attempt to identify and mitigate potential sources. The Houston-Galveston Area council’s assessments are more encompassing. They analyze trends in nutrient levels, bacteria concentrations, and other general water quality parameters such as dissolved oxygen and pH. They provide a report on the current water quality (specific to individual waterways) as well as some statistics on the percentage of water bodies improving and degrading. Their assessments are based on a comparison to state water quality standards (which can be found in Title 30 Chapter 307 of the Texas Administrative Code). There are two publications which provide snapshots of the water quality for individual water bodies based on the most recently analyzed data. These are links to the 2012 Basin Highlights report and the 2011 Basin Summary report. <a href="http://www.h-gac.com/community/water/publications/crp_basin_highlights_report_2012.pdf">http://www.h-gac.com/community/water/publications/crp_basin_highlights_report_2012.pdf</a> <a href="http://www.bsr2011.com/">http://www.bsr2011.com/</a></p>
Source Water Protection Plan	Policy / Regulation	Currently in effect [city-wide]	Yes	<p>The City of Houston recently revised Chapter 23 of the Code of Ordinance, which includes many measures to protect our lakes as a drinking water source, and there is a regulatory required wellhead protection program in place for the groundwater wells. There is also a Bacteria Implementation Plan for the region that was approved by the Texas Commission on Environmental Quality. Bacteria Implementation Plan: <a href="http://www.h-gac.com/community/water/tmdl/BIG/documents/42-HoustonBIG-lplan.pdf">http://www.h-gac.com/community/water/tmdl/BIG/documents/42-HoustonBIG-lplan.pdf</a> <a href="http://www.h-gac.com/community/water/tmdl/BIG/default.aspx">http://www.h-gac.com/community/water/tmdl/BIG/default.aspx</a></p>
Water Conservation Target	Policy / Regulation	Currently in effect [city-wide]	Yes	<p>The water utility does have water conservation targets of reducing unaccounted water use in the amount of 10% by 2020. This target was a recommendation by the Texas Water Development Board in 2009 and is part of the City's current conservation plan. In November 2012, the City of Houston passed amendments to the Chapter 47 Water and Sewers Ordinance. Sections 47-251 through 47-254 address water use reductions, during various stages of a water shortage, that range from 5% to 35%.</p>