



# Sustainability Tools for Assessing and Rating Communities for the City of Houston

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A technical internship report prepared in partial fulfillment of the requirements for the degree of  
MASTER of SCIENCE  
in  
Environmental Analysis and Decision Making

May 2015



## **Abstract**

### **The City of Houston’s Sustainability Efforts**

The City of Houston (COH) is dedicated to greening the community and pursuing a sustainable future for Houstonians.<sup>1</sup> In January 2014, the Sustainability Tools for Assessing and Rating (STAR) Communities selected Houston as one of twenty U.S. cities, towns, and counties to participate in its inaugural 2014 Leadership STAR Community Program. By gathering and collecting the information required for STAR certification, the City gained a deeper understanding of the community’s sustainability strengths, needs, and areas for improvement.

### **The STAR Sustainability Framework**

The STAR framework uses a comprehensive view of sustainability that surpasses traditional ecological and environmental definitions for the following goal areas:

1. Built environment
2. Climate and energy
3. Economy and jobs
4. Education, arts and community
5. Equity and empowerment
6. Health and safety
7. Natural systems
8. Innovation and process credits

Each goal area encompasses up to seven objectives that are evaluated by community level outcomes and local actions; STAR uses completed outcomes, objectives, and goal areas to produce a measurable indicator depicting the city’s progress towards sustainability. To achieve

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<sup>1</sup> Throughout this paper, the City of Houston (COH) and City (with a capital “C”) will refer to the government and the people working for the local government. Houston and city (with a lowercase “c”) will refer to the city itself.

progress towards shared community sustainability across a wide range of objectives, the STAR Rating System encourages strong partnerships between the City of Houston, regional committees, local organizations, and community groups.

### **My Role in STAR Reporting**

I worked continuously with Ms. Lin on STAR from June 2014 until January 2015 for the initial submission, and from March through April 2015 for edits and the final submission. For every goal area in the STAR Rating System, I read the technical manual, gathered information from different organizations, and entered the data and information in the Online Reporting Tool. I was also in charge of several other interns who worked for shorter periods of time throughout the summer and fall semesters. Around the initial deadline, I worked closely with Ms. Lin to finalize all of the data for the submission. I am currently reviewing the notes that the STAR verification team provided and revising the relevant information for the final submission.

### **Key Findings**

As of March 16, 2015, Houston is on track to achieve a 3-STAR Community rating out of 5, with an initial 236.48 verification score out of the total possible 720 points. After the final verification scoring and STAR certification, Houston will be the most populous city to be recognized as a STAR Certified Community. The City received the majority of its points for local actions, such as practice improvements and outreach campaigns. Although sustainability is a relatively new commitment for the City of Houston, these results show that Houston is committed to decisions and investments that will guide them towards a sustainable future.

## **Recommendations for the City of Houston's Future in Sustainability**

After using the STAR feedback and rating system to pinpoint Houston's strengths and areas for improvement, the City of Houston will use the STAR framework to develop the city's sustainability plan and climate action plan. Regularly reviewing the results from Houston and other STAR communities will allow decision makers and residents to observe Houston's progress towards achieving sustainability, create future plans to raise awareness, and increase sustainability in Houston's community.

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## **Introduction**

### **The Green Houston Office of Sustainability and STAR Communities**

The City of Houston (COH) began pursuing environmental initiatives in 2004 under Mayor Bill White and his Office of Environmental Programming. The momentum from their initiatives led Mayor Annise Parker to establish the city's first Green Office of Sustainability in 2010. This office is responsible for coordinating and implementing environmental projects and initiatives – such as alternative and clean transportation, green buildings, and waste minimization – that will improve Houston's communities.

Lisa Lin, Sustainability Manager at COH, oversaw the Sustainability Tools for Assessing and Rating (STAR) Communities assessment for Houston. In January 2014, STAR Communities selected Houston as one of twenty U.S. cities, towns, and counties to participate in its inaugural 2014 Leadership STAR Community Program. Throughout the year-long process, Ms. Lin and her team will be working on collecting data and information to put into the online reporting tool.

### **The STAR Sustainability System**

The STAR Community Rating System is designed to help governments identify, validate, and support implementation of best practices for sustainability. To define community-scale sustainability, the system uses a comprehensive vision that covers eight major goal areas:

1. Built environment
2. Climate and energy
3. Economy and jobs
4. Education, arts and community
5. Equity and empowerment
6. Health and safety

7. Natural systems
8. Innovation and process credits

### **Houston's Results and Future in Sustainability**

The City of Houston submitted the preliminary data for review on January 15, 2015. Two months later, the COH received comments back from the STAR reviewers and staff. A final submission from the COH will be turned in on April 15, 2015. Houston received a preliminary score of 236.5 out of a maximum possible 720 points, which earned Houston a 3-STAR Certification rating. In the next month, Ms. Lin and I will be submitting supplementary information to address questions from the STAR staff in our initial submission. A follow-up submission may result in increased points for the COH's final submission, although it will not be possible to achieve a 4-STAR Community Rating during this assessment cycle due to the lack of points necessary to reach the next certification level. Therefore, the final approved 3-STAR Community Rating will last for three years.

The COH and the Green Houston Office of Sustainability will be using the rating and STAR framework to review what Houston has already implemented and what actions will be taken in the future. The COH will monitor any ongoing actions to supplement the STAR submission's data; more importantly, the COH will use STAR as a holistic sustainability framework to complete a city sustainability plan in the future.

### **STAR Community Rating System**

The Sustainability Tools for Assessing and Rating (STAR) Community Rating System is the first



national assessment and certification program for sustainable communities. Local governments built this system to engage and evaluate their communities.

### Development and Evolution

Developed between 2008 and 2012, the STAR rating system was first released in October 2012.

The Pilot STAR Communities consisted of 30 early adopters who were the first to pursue certification. Tacoma, Washington became the first STAR-Certified Community in November 2013 (STAR Staff, 2015). As seen in Table 1, 23 communities have become certified since then.

Table 1: Officially certified STAR Communities as of March 2015 (STAR Staff, 2015).

5-STAR Communities	4-STAR Communities	3-STAR Communities
Northampton, MA	Austin, TX	Albany, NY
Seattle, WA	Broward County, FL	Atlanta, GA
	Davenport, IA	Birmingham, AL
	Evanston, IL	Chandler, AZ
	Memphis, TN	Cleveland, OH
	Portland, OR	Des Moines, IA
	Tucson, AZ	El Cerrito, CA
	Washington, DC	Fayetteville, AR
		Fort Collins, CO
		Indianapolis, IN
		Lee County, FL
		Woodbridge Township, NJ

Eight Technical Advisory Committees comprised of experts in a wide variety of fields determined the metrics for evaluating government progress in sustainability. The Technical Advisory Committees answered to the Steering Committee, which guided the development of the STAR Community Rating System according to the mission, guiding principles, and strategic plan of STAR Communities. The committees were consolidated into a 21-member Technical Advisory Group after the rating system was released in 2012 (Technical Guide to the STAR Community Rating System, 2015). The group clarified and advances the technical aspects of the system, as well as builds and improves the requirements. The contents of the system change over time and adapt to innovation, research, and changing conditions in the field. All changes to STAR have to be approved by the Technical Advisory Group; then the changes are sent to the Steering Committee for revision and acceptance.

### **Framework of the Rating System**

The STAR framework covers seven goal areas, each with multiple objectives that are further defined by community level outcomes and local actions. These outcomes and local actions comprise 526 measurable indicators in the system, which are then entered into STAR's customized online reporting tool. The scoring from the indicators then generates the community's score out of the total possible 720 points to show the community's progress towards STAR certification. Table 2 shows STAR's 44 objectives organized by goal area.

Table 2: STAR Goals and Objectives (Technical Guide to the STAR Community Rating System, 2015).

<b>Built Environment</b>	<b>Climate &amp; Energy</b>	<b>Economy &amp; Jobs</b>	<b>Education, Arts &amp; Community</b>	<b>Equity &amp; Empowerment</b>	<b>Health &amp; Safety</b>	<b>Natural Systems</b>
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health & Health System	Invasive Species
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Prevention & Response	Natural Resource Protection
Housing Affordability	Industrial Sector Resource Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality
Infill & Redevelopment	Resource Efficient Buildings	Targeted Industry Development	Social & Cultural Diversity	Human Services	Indoor Air Quality	Water in the Environment
Public Spaces	Resource Efficient Public Infrastructure	Workforce Readiness		Poverty Prevention & Alleviation	Natural & Human Hazards	Working Lands
Transportation Choices	Waste Minimization				Safe Communities	

## Evaluation Measures

As previously mentioned, the two types of evaluation measures are community level outcomes and local actions. Outcomes depict the community’s progress towards the particular objective. Outcomes are typically represented as trend lines, thresholds, or targets that need to be met to receive points for an objective. The STAR online reporting tool provides Excel spreadsheet templates to fill in data and information; based on the data, the community will either meet the required threshold, be on a trend to meet the threshold, or will not meet the requirements. Within

particular objectives, STAR will offer partial credit or multiple options for communities that are unable to meet one requirement.

Local actions include a wide range of decisions or activities that the community can make or engage in to achieve the outcome. The local actions focus on collaborations and can include efforts by the public, private, and non-profit organizations within the community. There are nine different action types in the rating system as shown in Table 3: STAR Rating System's action types (Technical Guide to the STAR Community Rating System, 2015).

Action Types	
Education and Outreach	Preparatory
Plan Development	
Policy and Code Adjustment	
Partnerships and Collaboration	
Practice Improvements	
Inventory, Assessment or Survey	
Enforcement and Incentives	Implementation
Programs and Services	
Facilities and Infrastructure Improvements	

. Preparatory Actions are foundation steps essential to assess the community’s needs, identify and execute regulatory changes, and strengthen partnerships. Implementation Actions are programs, enforcement mechanisms, and infrastructure investments that a community uses to become sustainable.

Table 3: STAR Rating System's action types (Technical Guide to the STAR Community Rating System, 2015).

Action Types	
Education and Outreach	Preparatory
Plan Development	
Policy and Code Adjustment	
Partnerships and Collaboration	
Practice Improvements	
Inventory, Assessment or Survey	

Enforcement and Incentives	Implementation
Programs and Services	
Facilities and Infrastructure Improvements	

The seven goal areas are each worth 100 points with the exception of the Education, Arts and Community area, which is worth 70 points because it has fewer objectives. The eighth goal area (Innovation and Process Credits) is worth 50 points and serves as extra credit to supplement areas for which communities found it more difficult to achieve their goals due to geographical, climate, or jurisdictional factors. Communities earn points by applying data and information for outcomes and actions. Certain objectives for which outcomes represent national standards allow communities to achieve 100% of the points possible for that outcome without applying information to local actions. When outcomes reflect a local threshold or trend, communities can achieve up to 70% of the objective’s points and apply for supplementary points through actions.

**Verification, Certification, and Recognition**

Communities can choose one of three STAR subscriptions to begin their path to sustainability. The three choices differ based on the participating community’s progress in sustainability, ranging from just starting to pursue sustainability to ready to achieve STAR certification. At the lowest level, the Participating STAR Community is working to assess their city’s current conditions, set goals and priorities, and share a sustainability framework. The Reporting STAR Community is ready to be recognized for their sustainability efforts through the certification program; at this level, the city will have been tracking some sustainability metrics over time. The Leadership STAR Community is already organized around the rating system and is able to collect and report data to receive a certified STAR Community Rating; these communities will have access to the STAR staff, online tools, training programs, and technical assistance needed

to be certified. Chosen as one of twenty cities to participate in the 2014 Leadership STAR Community Program, Houston started working towards certification to demonstrate its commitment to sustainability and to receive national recognition for their leadership and achievements in greening Houston.

Starting on January 2014, the City of Houston Green Office of Sustainability had one year to collect data and information to put into the STAR Online Reporting Tool. After they documented their progress, they submitted their application on January 15, 2015. The STAR verification team reviewed the application over a 60 day period; on March 16, 2015, awarded Houston a preliminary 236.5 score out of a maximum possible 720 points, resulting in a 3-STAR Community rating. The number of points received determines the community’s recognition or certification level. Table 4 outlines the point ranges for each certification level and recognition level. At this time, Ms. Lin and her team are working to revise and supplement the application. The final application will be submitted on April 15, 2015.

*Table 4: Point breakdown for the certification rating levels (Technical Guide to the STAR Community Rating System, 2015).*

<b>Certification Rating Level</b>	<b>Point Range</b>
5-STAR Community <i>Recognized as a top tier achiever in national sustainability</i>	600+
4-STAR Community <i>Recognized for sustainability leadership</i>	400-599
3-STAR Community <i>Recognized for sustainability leadership</i>	200-399
Reporting STAR Community <i>Currently pursuing certification</i>	< 200

## **STAR’s Objectives**<sup>2</sup>

<sup>2</sup> Tables that show the full available point breakdowns for each goal area are located in the appendices.

The first seven goal areas each include multiple objectives that are further evaluated by community level outcomes and local actions. The eighth goal area serves as a supplementary section for communities to detail their emerging and leading edge practices that improve sustainability. The outcomes and local actions make up 526 measurable indicators in the system, which are then entered into STAR's customized online reporting tool. The scoring from the indicators then generates the community's score out of the total maximum possible 720 points. The following sections will give a broad overview of each goal area followed by the COH's approved points and Houston's sustainability highlights respective to each goal area.

## **Built Environment**

The goal for Built Environment is to achieve a quality standard of livability, choice, and access for the community. The objectives in this goal area evaluate community development patterns and design characteristics, covering Ambient Noise and Light, Community Water Systems, Compact and Complete Communities, Housing Affordability, Infill and Redevelopment, Public Spaces, and Transportation Choices. The COH received a preliminary score of 33.83 out of 100 points for Built Environment.

The COH received the majority of its points from Community Water Systems, which focuses on providing a clean and secure water supply for Houston's users through management of potable water, wastewater, and stormwater. The City of Houston works extensively to manage its community water systems and natural water bodies. The COH and Department of Public Works and Engineering release publicly-accessible annual drinking water quality reports for federally regulated and monitored contaminants in drinking water sources. While the City was able to

demonstrate that it had a secure water supply by measuring the height of the water table and surface waters, it was unable to demonstrate that its drinking water quality met EPA's 5% standard for coliform bacteria in water pipes for the past three years.

The COH and PWE are also responsible for releasing the City of Houston Water Conservation Plan, which highlights Houston's continuous progress in preserving long-term water supplies for the city and the greater Houston region. The Water Conservation Plan details many of Houston's water programs and services, such as the Consumption Awareness Program, Internal Water Loss Program, Mainline Leak Detection Program, and revisions and updates of municipal plumbing codes and building standards (COH and PWE, 2014).

The COH, PWE, and Regional Water Planning Group collaborate to develop a City of Houston Drought Contingency Plan, which covers: plans and procedures to be implemented in the case of water shortages (COH and PWE, 2014); different stages or conditions; the triggers for each stage; and the requirements and target reductions that need to be met to end the emergency conditions.

## **Climate and Energy**

The goal for Climate and Energy is to reduce climate impacts through adaptation and mitigation efforts, as well as increasing resource efficiency. Reducing harmful climate impacts by promoting economic savings and decreasing resource use is the key to a healthier and more sustainable community. The seven objectives cover Climate Adaptation, Greenhouse Gas Mitigation, Greening the Energy Supply, Industrial Sector Resource Efficiency, Resource



Efficient Buildings, Resource Efficient Public Infrastructure, and Waste Minimization. The COH received a preliminary score of 47.41 out of 100 points for Climate and Energy.

The COH has also excelled in local actions for their extensive work on climate and energy goals for Houston. Houston is part of multiple collaborations within the climate field and partnerships within the city including: President Obama's Task Force for Climate Preparedness and Resilience, Green Building Resource Center Advisory Committee, C40, Department of Energy Better Buildings Challenge, and Solid Waste Management Committee.

The COH and Institute of Real Estate Management (IREM) have collaborated to create the Houston Green Office Challenge and IREM Sustainable Property Challenge to improve whole-building sustainability. This challenge involves completing activities in education and outreach, energy, water conservation, materials and waste, interior and exterior purchasing, transportation, and stakeholder engagement (Lin, 2010). The objectives in the challenge align closely with STAR, showing how COH is developing holistic systems that approach sustainability on both individual building and community scales.

For instance, LightsOut Houston is an initiative to turn off unnecessary lights in commercial buildings for three days after Earth Day; in 2014 alone, about 134,000,000 square feet of office space in Downtown Houston participated in the program, resulting in an estimated \$5 million in annual cost savings (Mulvaney, 2014). In another example of the COH's programs dedicated to climate and energy, the municipal electric vehicle (EV) project was the largest deployment of EVs and charging infrastructure in history; the City now owns fifty municipal fleet vehicles and

has installed over 200 charging stations over the past three years.

## **Economy and Jobs**

The goal for Economy and Jobs is to create equal shared prosperity and access to quality jobs. A robust local economy will attract new businesses and quality jobs, thus securing its economic sustainability. The goal area seeks to fortify existing industry clusters in Houston (retail trade, health care and social assistance, professional scientific and technical services) and promote emerging green industries to diversify the local economy. The six objectives in Economy and Jobs are Business Retention and Development, Green Market Development, Local Economy, Quality Jobs and Living Wages, Targeted Industry Development, and Workforce Readiness. The COH received a preliminary score of 34.87 out of 100 points for Economy and Jobs.

The City has implemented many local actions to further the green market, including a green purchase policy for municipal transportation and non-transportation energy supplies, educational materials to foster green businesses and practices, and programs to help businesses transition to new green practices. Many of these advances in the green market overlap with the outcomes and actions from the Climate and Energy goal area. Within Houston's targeted industry sectors, the COH noted an increase in sales and value of businesses, total number of new businesses, and total employment. The City has also invested in market studies and research to support this continued growth and expansion of the targeted industry sectors; this ensures that while Houston maintains growth in its historical economy, the city will also see an increase in the green economy.

## **Education, Arts and Community**

The goal for education, arts, and the community is to invest in an educated, connected, and diverse community. A connected community encourages positive interaction between community members, while having a socially and culturally diverse community enhances the local history and allows community groups to educate each other in their respective perspectives. The five objectives in this goal area cover Arts and Culture, Community Cohesion, Educational Opportunity and Attainment, Historic Preservation, and Social and Cultural Diversity. The COH received a preliminary score of 33 out of 70 points for Education, Arts and Community.

Houston excelled in historic preservation and promoting social and cultural diversity. The City has multiple historical districts and landmarks that reinforce Houston's existing community and local history. The city also provides programs and incentives to encourage the rehabilitation of historic buildings and reinvestment in older historic neighborhoods and commercial areas. Houston invests heavily in social and cultural events throughout the community; the City provides financial and logistical support for programs, activities, and events that celebrate the understanding and respect for diversity.

## **Equity and Empowerment**

The goal for Equity and Empowerment is to ensure justice, inclusion, and access to opportunities for all residents. This goal area observes citizen participation in civic affairs, distribution of benefits and burdens of development, enjoyment of civil and human rights, and programs that seek to decrease poverty and increase self-sufficiency. The six objectives in Equity and Empowerment are Civic Engagement, Civil and Human Rights, Environmental Justice,

Equitable Services and Access, Human Services, and Poverty Prevention and Alleviation. The COH received a preliminary score of 20.62 out of 100 points for Equity and Empowerment.

Although the City has programs that met STAR's metrics for environmental justice and received the majority of points for this goal area from those endeavors, the City and Office of Sustainability team recognized that there are still significant opportunities for improvement.

While the City of Houston was able to demonstrate progress towards reduced risk and exposure to pollution and toxics, as well as alleviating disproportionate health hazards, the programs and services dedicated to pollution reduction are not emphasized in areas of low-income residents and persons of color. The City will be working closely with the Bureau of Pollution Control and Prevention and many experts to assess risk and exposure, set pollution reduction targets, implement projects, and monitor improvements for the future.

## **Health and Safety**

The goal for Health and Safety is to strengthen communities by fortifying protection and reducing risk. This goal area requires the City to proactively prevent disease, injury, and premature death. The objectives largely promote efforts to maintain active lifestyles, develop and sustain high quality local health systems, minimize emergency impacts, and reduce vulnerability to hazards. The seven objectives in the Health and Safety goal area are Active Living, Community Health and Health System, Emergency Prevention and Response, Food Access and Nutrition, Indoor Air Quality, Natural and Human Hazards, and Safe Communities. The COH received a preliminary score of 45.9 out of 100 points for Health and Safety.

Houston excelled in active living, health care, and emergency management for the health and safety goal area. Many of these points came from enabling adults and children to integrate physical activity in their daily routines, achieving an equally accessible high quality local health system, and collaborating with community and regional groups to mobilize emergency prevention and response. STAR's metric requires that 21% or fewer adults over the age of 20 report no leisure time or physical activity in the past month, but Houston reported 22%. Fortunately, there is a noticeable downward trend that should allow Houston to meet the threshold by the next submission.

Recognized as a Bicycle-Friendly Community in 2013, Houston constantly works to incentivize bicycle and pedestrian amenities throughout Houston. Article IV Transit Corridor Development (2013) in the Houston Code of Ordinances requires that any new development must contain pedestrian and bike amenities, including pedestrian spaces, hardscape, street lights, and bicycle racks. The COH also works with BikeHouston to promote the benefits of bicycling around Houston; together, they have helped install bike racks on buses, created a bike sharing program with B-Cycle, and improved sidewalk and road conditions for pedestrians and bicyclists.

Houston's local public health department was accredited by the Public Health Accreditation Board in 2014, which shows Houston's commitment to public health issues, prevention, and wellness. Houston's public health work includes community health improvement plans, performance management systems, and comprehensive analyses of public health conditions, trends, and problems affecting the community; together, these efforts serve to strengthen the delivery of health services and improve community health.

Another department that has excelled in Houston's health and safety goals is the Office of Emergency Management, which has been exceedingly successful in reducing harm to humans and property in emergency incidents. The Houston-Galveston Area Council and regional mayors and county judges collaborated to create the Multi-Agency Coordination Center, which coordinates emergency management resources during a disaster event. The Center works with the Regional Catastrophic Planning Team to review and update plans annually based on other regional planning efforts and best practice exercises.

The City of Houston Emergency Management Plan and Downtown Emergency Response Plan both cover various emergencies and priorities to be completed in consecutive phases from before the event to the resumption of business after the event. Both plans thoroughly list emergency response procedures and protocols, as well as major contacts for particular departments and disasters, such as hotels, transportation officials, and the police and fire department (City of Houston Mayor's Office of Emergency Management, 2014; Houston Downtown Management District, 2014).

## **Natural Systems**

The goal for Natural Systems is to protect and restore the natural resources in the community. The community receives a wide range of benefits and environmental services such as food, water purification, and climate and flood regulation, all of which also provide aesthetic and recreational value for the community. The six objectives in the Natural Systems goal area are Green Infrastructure, Invasive Species, Natural Resource Protection, Outdoor Air Quality, Water

in the Environment, and Working Lands. The COH received a preliminary score of 20.85 out of 100 points for Natural Systems.

Outdoor air quality is linked to multiple objectives in the STAR Rating System, including Working Lands, Greenhouse Gas Mitigation, and Waste Minimization. Improving outdoor air quality in Houston would alleviate many public health threats that aggravate respiratory and cardiovascular illnesses, and would decrease the financial burden of chronic diseases on Houston's workforce and increase economic productivity. While Houston's outdoor air quality did not meet STAR's requirement for PM 2.5, PM 10, and ozone to all be attained or decreasing in annual concentration, the COH has gone through many local actions to improve outdoor air quality. The City had adopted regulatory strategies that incentivize mixed-use development, performance-based parking strategies, and collaborations with local industrial operations to minimize noxious odors. The COH has also partnered with local universities, health groups, and regional organizations to study the health impacts of outdoor air quality. Finally, the City promoted rideshare programs and alternative transportation, improved traffic signal timing at intersections, and increased tree canopy throughout Houston.

Developed by industry experts, city officials, the Houston Parks Board, and other stakeholders, the Bayou Greenways 2020 Program aims to transform the major bayous of Houston into greenways of natural beauty, connectivity, recreation, preservation, and increased functionality. This program will add approximately 1,500 additional acres of greenspace and create 150 miles of continuous off-street trails, ensuring that 6 out of 10 Houston residents will live within 1.5 miles of one of the bayou trails. Additionally, the increased equitable distribution

of greenspaces for Houston offers substantial economic value. In November 2012, Houston residents voted to approve a proposition allocating \$100 million to support the program (Crompton, 2011).

### **Innovation and Process Credits**

Due to geographical, historical, economic, or political factors, not all communities have the same access to sustainability outcomes and actions as detailed by the STAR framework, Innovation and Process Credits is a special category for communities to detail their emerging discoveries and cutting edge practices in sustainability. The four sections available for extra credit and points are Best Practices and Processes, Exemplary Performance, Local Innovation, and Regional Priorities.

The STAR verification team gave the COH received a preliminary score of 0 out of 50 points for Innovation and Process Credits, noting that more information was needed. The City believes that they excel at Public Engagement and Codes and Ordinances as a form of the COH's Best Practices and Processes. The City of Houston has managed to bring public engagement through all of the STAR objectives; the COH offers multiple programs, services, educational campaigns, and awareness events to engage the public in many facets of sustainability. The programs engage interested stakeholders and ensure that any implementation reflects the community's values and priorities. The City has also adopted and updated codes and ordinances to help Houston have consistent regulations and processes that reflect the community goals.

### **Sustainability for Houston**



## **Key Findings**

The City of Houston will receive a 3-STAR Community rating after the final submission on April 15, 2015. The City received most of its points through local actions; the Green Houston Office of Sustainability, in conjunction with departments throughout the COH, has been able to implement programs, services, and codes to guide Houston towards sustainability. Because the majority of the actions have been implemented recently, there is not enough data available for long-term trends to input into the STAR Online Reporting Tool. Fortunately, STAR recognizes that not all cities have been working towards sustainability for the same time period, so the system provides action points that COH used to show its commitment to sustainability investments. The positive trends from Houston's action implementations will be evident in the coming years. Houston's local sustainability action accomplishments are a result of other cities' positive trends and best practices; the City, in conjunction with the STAR key staff, benefits from a very diverse knowledge base from stakeholders ranging from NGOs to other cities' local governments.

Throughout the STAR Communities process, the Ms. Lin's team realized that many of its projects accomplished outcomes and actions that crossed over multiple objectives. Rather than implementing multiple small projects to address minor aspects of sustainability one at a time, the COH implements projects and services that approach Houston as a holistic system. This approach allowed COH to input outcomes and actions that cross over multiple objectives during the STAR Communities process. The City's efficiency in accomplishing multiple objectives in one implementation can be clearly seen in crossovers throughout the Climate and Energy goal area. Many programs and services, such as the municipal electric vehicle fleet and green building

codes, are represented in Climate Adaptation, Greenhouse Gas Mitigation, Greening the Energy Supply, Resource Efficient Buildings, Green Market Development and more objectives.

The COH has been able to observe short-term trends through the Kinder Institute for Urban Research's Houston Area Survey (Klineberg, 2014). In the past five years, Houston communities have become more aware of sustainability and quality of life issues. Surveyed Houstonians have shown a higher preference for transit-oriented development rather than car-centered development. There is an increase in the desire for mixed-use development, smaller urbanized residences within walking distance of workplaces and commerce centers, and more spending on public and alternative transportation improvements. From 1982 to 2012, an increasing number of Houstonians believe that national programs are spending too little money on improving and protecting the environment (Rice University Kinder Institute for Urban Research, 2012). While STAR may not fully capture these changing attitudes and social perceptions of sustainability in its rating system framework, it is clear that Houston and its citizens are becoming more conscious of sustainability and its place in Houston's future.

### **Areas for Improvement**

The COH needs to observe the STAR Rating System's results and create plans to address areas where Houston lacks sustainability initiatives. The most notable gaps are the Built Environment, Economy and Jobs, Equity and Empowerment, and the Natural Systems goal areas.

### ***Improvements for Built Environment***

Within the Built Environment goal area, there were few programs dedicated to Ambient Noise and Light, Infill and Redevelopment, and Public Spaces. Due to Houston's urban sprawl, there were inadequate policy commitments to limit expansion of jurisdiction boundaries and urban services. Although there were informal or independent initiatives throughout the city that fit the STAR criteria, the City did not have formalized programs to match STAR's requirements. For example, there was no formalized community program that supported temporary creative neighborhood uses for vacant properties and greyfields. However, local groups had collaborated to reform an old Museum District property into a church community garden.

### ***Improvements for Economy and Jobs***

Within Economy and Jobs, Houston received minimal points for local actions and programs in the Local Economy, Quality Jobs and Living Wages, and Workforce Readiness objectives. The City did not show improvements in any of the outcomes for the three objectives, such as improvements in workforce training outcomes, increased post-secondary educational attainment, or increased total funds in local institutions. Outreach campaigns were not as informative, available, and developed as STAR required; Houston also had very few organizations dedicated to living wages or workforce readiness.

### ***Improvements for Equity and Empowerment***

The City of Houston needs to implement many changes to increase its Equity and Empowerment score. Most cities working towards sustainability have struggled with this goal area. While many cities have fulfilled the requirements for voting and poverty prevention, the most complicated objective to understand and achieve is the Environmental Justice objective. Houston received

many points for this objective by having partnerships, assessments and inventories, policy adjustments, practice improvements, enforcement, and infrastructure at the ten environmental justice sites required by STAR. However, the COH team does not believe that a community's environmental justice can be characterized by the monitoring of ten sites. Instead, they believe that even though the Bureau of Pollution Control and Prevention has air and water quality monitoring throughout Houston, the monitoring stations are not focused on low-income environmental protection, which detracts from the city's environmental justice goals.

Some areas in which the City struggled to achieve points are Civil and Human Rights, Equitable Services and Access, and Human Services. While these services are not necessarily lacking throughout Houston relevant groups are scattered throughout Houston, and the scarcity of available aggregate information and contacts meant there was no way to collect the appropriate data for STAR. Having contacts and liaisons within the City who can compile the materials needed will improve this issue.

### ***Improvements for Natural Systems***

Other than Outdoor Air Quality and Water in the Environment, the Natural Systems goal area also lacked conclusive information. There was little to no information on the trends for outcomes in the STAR requirements. While it is possible that Houston does fulfill the outcomes for Green Infrastructure, Invasive Species, Natural Resource Protection, and Working Lands, there was no time to process the data that was available, and the team moved onto other more time-efficient objectives. Given extra time, it is likely that the City would be able to process the data and earn more points in this area.

## **Conclusion**

Houston received an initial score of 236.5 out of 720 points, which awarded Houston a 3-STAR Community Rating. Because the COH has only recently begun implementing sustainability efforts for the community, there were few long-term trends that were able to fit STAR's criteria and count for points in the rating system. The City therefore received most of its points from the local actions, which shows that the City is committed to implementing sustainability initiatives through programs and services.

According to the STAR, Houston excelled at initiatives that focused on climate change adaptation, green energy implementation, community water source management, and community health improvement. Some of Houston's sustainability highlights include the municipal EV fleet, Houston Green Office Challenge, COH Water Conservation and Drought Contingency Plans, PHAB-accredited public health department, and emergency management plans. On the other hand, Houston severely lacked projects that could further sustainability in green infrastructure, equity and empowerment, natural resource protection, equity, and economy. The City had little to no green infrastructure plans to improve the connectivity and walkability of Houston. There were also limited access and proximity by residents of diverse income levels and ethnicities to community facilities, services, and infrastructure. The City should look to create plans and actions to fill in these gaps in order to pursue community sustainability.

The City of Houston will be using the STAR Rating System as a starting point for its future as a sustainable community. The inputs and results from STAR provide a baseline for what the City

has already committed to sustainability. The STAR rating system and feedback from the staff have helped Houston pinpoint its strengths and areas for improvement, and the STAR framework will help develop the city's future sustainability plans and climate action plans. By aligning closely with the STAR program, the COH is on track to raise awareness and increase sustainability in Houston's community.

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## Appendices

Built Environment	Climate & Energy	Economy & Jobs	Education, Arts & Community	Equity & Empowerment	Health & Safety	Natural Systems
Ambient Noise & Light	Climate Adaptation	Business Retention & Development	Arts & Culture	Civic Engagement	Active Living	Green Infrastructure
Community Water Systems	Greenhouse Gas Mitigation	Green Market Development	Community Cohesion	Civil & Human Rights	Community Health & Health System	Invasive Species
Compact & Complete Communities	Greening the Energy Supply	Local Economy	Educational Opportunity & Attainment	Environmental Justice	Emergency Prevention & Response	Natural Resource Protection
Housing Affordability	Industrial Sector Resource Efficiency	Quality Jobs & Living Wages	Historic Preservation	Equitable Services & Access	Food Access & Nutrition	Outdoor Air Quality
Infill & Redevelopment	Resource Efficient Buildings	Targeted Industry Development	Social & Cultural Diversity	Human Services	Indoor Air Quality	Water in the Environment
Public Spaces	Resource Efficient Public Infrastructure	Workforce Readiness		Poverty Prevention & Alleviation	Natural & Human Hazards	Working Lands
Transportation Choices	Waste Minimization				Safe Communities	

Figure 1: STAR Goals and Objectives (Technical Guide to the STAR Community Rating System, 2015).

Objective Number	Objective Title and Purpose	Available Points
BE-1	<b>Ambient Noise &amp; Light:</b> <i>Minimize and manage ambient noise and light levels to protect public health and integrity of ecological systems</i>	5
BE-2	<b>Community Water Systems:</b> <i>Provide a clean and secure water supply for all local users through the management of potable water, wastewater, stormwater, and other piped infrastructure</i>	15
BE-3	<b>Compact &amp; Complete Communities:</b> <i>Concentrate development in compact, human-scaled, walkable centers and neighborhoods that connect to transit, offer diverse uses and services, and provide housing options for families of all income levels</i>	20
BE-4	<b>Housing Affordability:</b> <i>Construct, preserve, and maintain an adequate and diverse supply of location-efficient and affordable housing options for all residents</i>	15
BE-5	<b>Infill &amp; Redevelopment:</b> <i>Focus new growth in infill areas and on redevelopment that does not require the extension of water, sewer, and road infrastructure or facilitate sprawl</i>	10
BE-6	<b>Public Spaces:</b> <i>Create a network of well-used and enjoyable parks and public spaces that feature equitable, convenient access for residents throughout the community</i>	15
BE-7	<b>Transportation Choices:</b> <i>Promote diverse transportation modes, including walking, bicycling, and transit, that are safe, low-cost, and reduce vehicle miles traveled</i>	20
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 2: Point breakdown for the Built Environmental Goal Area (Technical Guide to the STAR Community Rating System, 2015).

<b>Objective Number</b>	<b>Objective Title and Purpose</b>	<b>Available Points</b>
<b>CE-1</b>	<b>Climate Adaptation:</b> <i>Strengthen the resilience of communities to climate change impacts on built, natural, economic, and social systems</i>	15
<b>CE-2</b>	<b>Greenhouse Gas Mitigation:</b> <i>Achieve greenhouse gas emissions reductions throughout the community</i>	20
<b>CE-3</b>	<b>Greening the Energy Supply:</b> <i>Transition the local energy supply for both transportation and non-mobile sources toward the use of renewable, less carbon-intensive, and less toxic alternatives</i>	15
<b>CE-4</b>	<b>Industrial Sector Resource Efficiency:</b> <i>Minimize resource use and demand in the industrial sector as a means to mitigate greenhouse gas emissions and conserve water</i>	10
<b>CE-5</b>	<b>Resource Efficient Buildings:</b> <i>Improve the energy and water efficiency of the community's residential, commercial, and institutional building stock</i>	15
<b>CE-6</b>	<b>Resource Efficient Public Infrastructure:</b> <i>Minimize resource use and demand in local public infrastructure as a means to mitigate greenhouse gas emissions and conserve water</i>	10
<b>CE-7</b>	<b>Waste Minimization:</b> <i>Reduce and reuse material waste produced in the community</i>	15
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 3: Point breakdown for the Climate and Energy Goal Area (Technical Guide to the STAR Community Rating System, 2015).

<b>Objective Number</b>	<b>Objective Title and Purpose</b>	<b>Available Points</b>
<b>EJ-1</b>	<b>Business Retention &amp; Development:</b> <i>Foster economic prosperity and stability by retaining and expanding businesses with support from the business community</i>	20
<b>EJ-2</b>	<b>Green Market Development:</b> <i>Increase overall market demand for products and services that protect the environment</i>	15
<b>EJ-3</b>	<b>Local Economy:</b> <i>Create an increasingly self-reliant community through a robust local economy with benefits shared by all</i>	15
<b>EJ-4</b>	<b>Quality Jobs &amp; Living Wages:</b> <i>Expand job opportunities that support upward economic mobility and provide sufficient wages so that working people and their families can afford a decent standard of living</i>	20
<b>EJ-5</b>	<b>Targeted Industry Development:</b> <i>Increase local competitiveness by strengthening networks of businesses, suppliers, and associated institutions</i>	15
<b>EJ-6</b>	<b>Workforce Readiness:</b> <i>Prepare the workforce for successful employment through increasing attainment of post-secondary education and improving outcomes of workforce development programs</i>	15
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 4: Point breakdown for the Economy and Jobs Goal Area (Technical Guide to the STAR Community Rating System, 2015).

<b>Objective Number</b>	<b>Objective Title and Purpose</b>	<b>Available Points</b>
<b>EAC-1</b>	<b>Arts &amp; Culture:</b> <i>Provide a broad range of arts and cultural resources and activities that encourage participation and creative self-expression</i>	15
<b>EAC-2</b>	<b>Community Cohesion:</b> <i>Ensure a cohesive, connected community through adequate venues for community interaction, community building activities and events, and the sharing of information about community issues and services</i>	15
<b>EAC-3</b>	<b>Educational Opportunity &amp; Attainment:</b> <i>Achieve equitable attainment of a quality education for individuals from birth to adulthood</i>	20
<b>EAC-4</b>	<b>Historic Preservation:</b> <i>Preserve and reuse historic structures and sites to retain local, regional, and national history and heritage, reinforce community character, and conserve resources</i>	10
<b>EAC-5</b>	<b>Social &amp; Cultural Diversity:</b> <i>Celebrate and respect diversity and represent diverse perspectives in community decision-making</i>	10
<b>Total Credit, Goal Area</b>		<b>70</b>

Figure 5: Point breakdown for the Education, Arts and Community Goal Area (Technical Guide to the STAR Community Rating System, 2015).

Objective Number	Objective Title and Purpose	Available Points
EE-1	<b>Civic Engagement:</b> <i>Improve community well-being through participation in local decision-making and volunteering with community organizations</i>	15
EE-2	<b>Civil &amp; Human Rights:</b> <i>Promote the full enjoyment of civil and human rights for all residents in the community</i>	10
EE-3	<b>Environmental Justice:</b> <i>Reduce polluted and toxic environments with an emphasis on alleviating disproportionate health hazards in areas where low-income residents and persons of color live</i>	15
EE-4	<b>Equitable Services &amp; Access:</b> <i>Ensure equitable access to foundational community assets within and between neighborhoods and populations</i>	20
EE-5	<b>Human Services:</b> <i>Ensure high quality human services programs are available and utilized to guarantee basic human needs so that all residents lead lives of dignity</i>	20
EE-6	<b>Poverty Prevention &amp; Alleviation:</b> <i>Prevent people from falling into poverty and proactively enable those who are living in poverty to obtain greater, lasting economic stability and security</i>	20
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 6: Point breakdown for the Equity and Empowerment Goal Area (Technical Guide to the STAR Community Rating System, 2015).

<b>Objective Number</b>	<b>Objective Title and Purpose</b>	<b>Available Points</b>
<b>HS-1</b>	<b>Active Living:</b> <i>Enable adults and kids to maintain healthy, active lifestyles by integrating physical activity into their daily routines</i>	15
<b>HS-2</b>	<b>Community Health &amp; Health System:</b> <i>Achieve positive health outcomes and minimize health risk factors through a high quality local health system that is accessible and responsive to community needs</i>	20
<b>HS-3</b>	<b>Emergency Prevention &amp; Response:</b> <i>Reduce harm to humans and property by utilizing long-term preventative and collaborative approaches to avoid emergency incidents and minimize their impacts</i>	15
<b>HS-4</b>	<b>Food Access &amp; Nutrition:</b> <i>Ensure that adults and children of all income levels have opportunities to learn about nutritious eating and have physical and economic access to fresh, healthful food</i>	15
<b>HS-5</b>	<b>Indoor Air Quality:</b> <i>Ensure that indoor air quality is healthy for all people</i>	5
<b>HS-6</b>	<b>Natural &amp; Human Hazards:</b> <i>Reduce vulnerability to all hazards, secure critical infrastructure, and ensure that communities are prepared to effectively respond to and recover from crisis</i>	15
<b>HS-7</b>	<b>Safe Communities:</b> <i>Prevent and reduce violent crime and increase perceptions of safety through interagency collaboration and with residents as empowered partners</i>	15
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 7: Point breakdown for the Health and Safety Goal Area (Technical Guide to the STAR Community Rating System, 2015).

<b>Objective Number</b>	<b>Objective Title and Purpose</b>	<b>Available Points</b>
<b>NS-1</b>	<b>Green Infrastructure:</b> <i>Design and maintain a network of green infrastructure features that integrate with the built environment to conserve ecosystem functions and provide associated benefits to human populations</i>	20
<b>NS-2</b>	<b>Invasive Species:</b> <i>Prevent and manage invasive species in order to restore and protect natural ecosystems and the benefits they provide</i>	10
<b>NS-3</b>	<b>Natural Resource Protection:</b> <i>Protect, enhance and restore natural ecosystems and cultural landscapes to confer resilience and support clean water and air, food supply, and public safety</i>	20
<b>NS-4</b>	<b>Outdoor Air Quality:</b> <i>Ensure that outdoor air quality is healthy for all people and protects the welfare of the community</i>	15
<b>NS-5</b>	<b>Water in the Environment:</b> <i>Protect and restore the biological, chemical, and hydrological integrity of water in the natural environment</i>	20
<b>NS-6</b>	<b>Working Lands:</b> <i>Conserve and maintain lands that provide raw materials in ways that allow for sustained harvests and preserves ecosystem integrity</i>	15
<b>Total Credit, Goal Area</b>		<b>100</b>

Figure 8: Point breakdown of the Natural Systems Goal Area (Technical Guide to the STAR Community Rating System, 2015).



Section	Title and Purpose	Available Points
IP-1	<b>Best Practices &amp; Processes:</b> Recognize important local government practices and processes that underpin the implementation of sustainability measures and accelerate community-scale achievement across STAR Goal Areas	10
IP-2	<b>Exemplary Performance:</b> To reward performance in Community Level Outcome measures that significantly exceeds the evaluation criteria established by the existing STAR Community Rating System	10
IP-3	<b>Local Innovation:</b> To encourage and reward creative, effective approaches to enhancing a community's environmental, social and/or economic sustainability not reflected in existing STAR Objectives or evaluation measures	25
IP-4	<b>Regional Priorities:</b> To encourage coordinated regional action on the sustainability issues of greatest importance to the region in which the jurisdiction resides	5
<b>Total Points Available</b>		<b>50</b>

Figure 9: Point breakdown of the Innovation and Processes Goal Area (Technical Guide to the STAR Community Rating System, 2015).

Table 5: Initial Verification Scorecard as provided by the STAR Verification Team.

Initial Verification Scorecard

COMMUNITY: Houston, TX

Date of Scoring: 3/16/2015



Summary Points by Goal

Goal	Preliminary Score	Approved Score	Difference	Total Points Possible	% Earned
Built Environment	47.44	33.83	-13.61	100	33.83
Climate & Energy	53.91	47.41	-6.5	100	47.41
Economy & Jobs	54.94	34.87	-20.07	100	34.87
Education, Arts & Community	46.22	33	-13.22	70	47.14
Equity & Empowerment	37.68	20.62	-17.06	100	20.62
Health & Safety	55.82	45.9	-9.92	100	45.90
Natural Systems	41.33	20.85	-20.48	100	20.85
Innovation & Process	10	0	-10	50	0.00
<b>TOTALS --&gt;</b>	<b>347.34</b>	<b>236.48</b>	<b>-110.86</b>	<b>720</b>	<b>32.84</b>

Table 6: Summary Points by Objective as provided by the STAR Verification Team.

**Summary Points by Objective**

Goal	Objective	Approved Score	Total Points Possible	% Earned
Built Environment	BE-1: Ambient Noise & Light	0.3	5	6
Built Environment	BE-2: Community Water Systems	10.83	15	72.2
Built Environment	BE-3: Compact & Complete Communities	6.22	20	31.1
Built Environment	BE-4: Housing Affordability	4.42	15	29.46667
Built Environment	BE-5: Infill & Redevelopment	0.23	10	2.3
Built Environment	BE-6: Public Spaces	3.5	15	23.33333
Built Environment	BE-7: Transportation Choices	8.33	20	41.65
Climate & Energy	CE-1: Climate Adaptation	8.67	15	57.8
Climate & Energy	CE-2: Greenhouse Gas Mitigation	8.27	20	41.35
Climate & Energy	CE-3: Greening the Energy Supply	7.79	15	51.93333
Climate & Energy	CE-4: Industrial Sector Resource Efficiency	4.96	10	49.6
Climate & Energy	CE-5: Resource Efficient Buildings	12.29	15	81.93333
Climate & Energy	CE-6: Resource Efficient Public Infrastructure	0	10	0
Climate & Energy	CE-7: Waste Minimization	5.43	15	36.2
Economy & Jobs	EJ-1: Business Retention & Development	6.67	20	33.35
Economy & Jobs	EJ-2: Green Market Development	12.27	15	81.8
Economy & Jobs	EJ-3: Local Economy	2.39	15	15.93333
Economy & Jobs	EJ-4: Quality Jobs & Living Wages	1.83	20	9.15
Economy & Jobs	EJ-5: Targeted Industry Development	11.29	15	75.26667
Economy & Jobs	EJ-6: Workforce Readiness	0.42	15	2.8
Education, Arts & Community	EAC-1: Arts & Culture	3.77	15	25.13333
Education, Arts & Community	EAC-2: Community Cohesion	6.13	15	40.86667
Education, Arts & Community	EAC-3: Educational Opportunity & Attainment	8.04	20	40.2
Education, Arts & Community	EAC-4: Historic Preservation	8.96	10	89.6
Education, Arts & Community	EAC-5: Social & Cultural Diversity	6.1	10	61
Equity & Empowerment	EE-1: Civic Engagement	5.25	15	35
Equity & Empowerment	EE-2: Civil & Human Rights	0	10	0
Equity & Empowerment	EE-3: Environmental Justice	12.57	15	83.8
Equity & Empowerment	EE-4: Equitable Services & Access	0	20	0
Equity & Empowerment	EE-5: Human Services	0	20	0
Equity & Empowerment	EE-6: Poverty Prevention & Alleviation	2.8	20	14
Health & Safety	HS-1: Active Living	9.26	15	61.73333
Health & Safety	HS-2: Community Health & Health Systems	18.42	20	92.1
Health & Safety	HS-3: Emergency Prevention & Response	10.24	15	68.26667
Health & Safety	HS-4: Food Access & Nutrition	3.82	15	25.46667
Health & Safety	HS-5: Indoor Air Quality	1.88	5	37.6
Health & Safety	HS-6: Natural & Human Hazards	0.72	15	4.8
Health & Safety	HS-7: Safe Communities	1.56	15	10.4
Natural Systems	NS-1: Green Infrastructure	1.24	20	6.2
Natural Systems	NS-2: Invasive Species	1.68	10	16.8
Natural Systems	NS-3: Natural Resource Protection	2.55	20	12.75
Natural Systems	NS-4: Outdoor Air Quality	6.89	15	45.93333
Natural Systems	NS-5: Water in the Environment	6.16	20	30.8
Natural Systems	NS-6: Working Lands	2.33	15	15.53333
Innovation & Process Cred	Best Practices & Processes	0	10	0
Innovation & Process Cred	Exemplary Performance	0	10	0
Innovation & Process Cred	Local Innovation	0	25	0
Innovation & Process Cred	Regional Priorities	0	5	0
<b>TOTALS --&gt;</b>		<b>236.48</b>	<b>720</b>	<b>32.84444</b>