City of Boca Raton
Sustainability Action Plan
Target 2025

July 2019

City of Boca Raton Sustainability Action Plan

Target 2025

Table of Contents

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Executive Summary

Both the City's Strategic Plan and the Comprehensive plan include general goals and policies related to sustainability, the Sustainability Action Plan (SAP) is a roadmap towards implementing some of those policies through specific action. The City of Boca Raton established its Office of Sustainability in 2018. This plan is a collaboration between that office, City staff, community advisory boards, and citizens. The plan sets out preliminary goals to direct the Office of Sustainability and to guide sustainability efforts across City departments. The target date of 2025 set in the plan reflects when the plan should be updated, but annual progress reports and updates will be conducted.

Greenhouse Gas Inventory and Climate Change Vulnerability Assessment

Metrics presented in the plan are preliminary. One of the goals of the plan will be to establish better baselines and tracking of relevant data as well as gaining a better understanding from which to set targets.

The City will conduct a Greenhouse Gas inventory. Although the distribution of greenhouse gas emissions can be assumed based on regional inventories and similar nearby communities, it will be important to understand the City's particular emissions in order to better identify opportunities, set targets, and track progress. Targets in the plan are based on goals set out in the 2018 Intergovernmental Panel on Climate Change (IPCC) special report on warming on 1.5°C and can be modified and clarified as the City's greenhouse gas inventory is completed.

Boca Raton is one of 9 municipalities that have partnered with Palm Beach County to form the Coastal Resiliency Partnership (CRP) of Palm Beach County. The CRP will work collaboratively to address issues related to coastal resiliency and leverage pooled resources to attract the best projects, funding, and cost effectiveness. The first work project of the CRP will be a Climate Change Vulnerability Assessment (CCVA). The CCVA is expected to be completed in FY20. The assessment will identify vulnerable assets and populations and prioritize potential actions to mitigate and adapt to the identifies hazards. In the meantime, the plan assumes standard risks of climate change including higher storm surge, tidal flooding, stormwater flooding, and increased heat. The completion of the CCVA will result in recommended actions that can be incorporated into this plan and prioritized as appropriate.

Main goals

This action plan will focus on seven main areas; resource use, waste, the natural environment, the built environment, transportation, climate resiliency, and local government. There are many synergies and co-benefits between these seven areas and, when taken together, they form a comprehensive approach to protecting the environment, addressing climate change, and protecting the health of our residents, water bodies, and ecosystems.

Resource Use – Energy and Water

1. Reduce electricity used by the City
2. Reduce electricity used in the community
3. Increase electricity sourced by clean renewable sources
4. Reduce consumption of potable water

Waste

5. Reduce the amount of waste produced.
6. Increase waste diversion rates.
7. Reduce litter and plastic pollution.

Natural Environment

8. Maintain and improve air and water quality.
9. Increase tree canopy cover.
10. Increase wildlife habitat.

Built Environment

11. Increase green buildings.
12. Reduce light pollution.

Transportation

13. Increase alternative fuels.
14. Decrease vehicle miles travelled in City.
15. Decrease vehicle miles travelled by staff.

Climate Resiliency

16. Mitigate drivers of climate change.
17. Adapt to future conditions.
18. Reduce heat impacts on the community.

Government

19. Increase investment in sustainability.
20. Increase staff awareness of sustainability.
21. Increase City leadership on sustainability.

Implementation

The SAP is intended to be an adaptive document. Goals are broad and actions are high level. This strategy allows for the City to have flexibility to prioritize actions based on changing needs and to choose strategies based on ever evolving technologies and best practices. Progress towards goals and actions will be assessed annually and updated as needed. A new plan will be developed in 2025 based on the progress of the current plan, new information from assessments, and advancements in technologies and knowledge.

The final chapter of the plan recommends priorities for initial implementation. These priorities include a mixture of assessments, community outreach, programs, city operations, policies, and regulations.

Introduction:

What is Sustainability:

The City of Boca Raton's Strategic Plan describes a "Vibrant and Sustainable City" as one that achieves a balance between personal livability, environmental stewardship, economic opportunity, and community building. Sustainability means balance. Balance is desired between three main pillars, all of which contribute to quality of life and wellbeing. The three pillars of Sustainability are summarized as people, profit, and planet; sustainability balances social, economic and environmental priorities. In 1987, the United Nations in a report titled *Our Common Future* defined sustainable development as that which "meets the needs of the present without compromising the ability of future generations to meet their own needs." While all three pillars are essential for quality of life, the environment is foundational to the other two. Economies and societies cannot exist without the natural environment providing resources. Actions in this plan, while looking to benefit society and the economy, will focus on enhancing or minimizing impact on the natural environment.

In the 2010 Comprehensive Plan, the City identified sustainability as a guiding principle for future growth. As a sustainable community Boca Raton will conserve energy, protect the environment, use renewable materials, safeguard water resources, and preserve open space while providing for economic development and an enhanced quality of life. The comprehensive plan stated the City Council's commitment at the time to reducing air pollution and greenhouse gas production, conserving energy, protecting native wildlife, preserving environmentally sensitive land, conserving water resources, and providing educational programs that empower citizens and businesses to share the responsibility for environmental stewardship.

Origins and Purpose of this Plan:

This Sustainability Action Plan comes from many years of commitment and progress in the City towards environmental and climate goals. The actions already taken by the City will be described in the relevant chapters of this plan.

In 2010 the City formed the Green Living Task Force to advise the council on residential initiatives to promote local sustainability in the environment. This initial task force became the City's Green Living Advisory Board (GLAB). The scope of the GLAB was to advise City Council on topics and issues related to residential green living. In 2017 the City passed a resolution joining the Southeast Regional Climate Change Compact (Compact) and adopting the Mayor's Climate Action Pledge. The Pledge calls on cities to adopt goals and recommendations from the Compact's Regional Climate Action Plan (RCAP) in to future and existing comprehensive plans and sustainability action plans. In 2018 the City created the Office of Sustainability and hired a Sustainability Manager to develop and implement the City's first Sustainability Action Plan. In 2019 GLAB's scope was expanded to include all sustainability topics and the name of the board was changed to the Sustainability Advisory Board (SAB) to reflect that expansion.

Input into the actions of the plan came from the City and the community. Internally, a Sustainability Task Force was formed in order to develop goals in line with departmental goals and programs. The Task Force was comprised of representatives from multiple departments and offices including Utility Services, Recreation Services, Municipal Services, Information Technologies, Communications, Transportation, and Innovation. Input was also gathered from several other offices around the City.

Sustainability, Resiliency, and Being *Green*

The terms sustainability, resiliency, and being *green* are often used together and sometimes interchangeably. For the purpose of this action plan the three terms will all be considered but used in distinct ways.

> ***Sustainability*** will be used to emphasize a triple bottom line impact. The focus of the sustainability action plan overall and anything labeled "sustainable" will have benefits that are environmental but also which improve societal outcomes and are economically beneficial.
>
> ***Resiliency*** will refer to actions which are intended to address and protect against expected hazards and vulnerabilities, current or projected for the future. These vulnerabilities may be economic, social, or environmental. In the context of this action plan, resiliency will relate primarily to climate related hazards.
>
> ***Green*** refers to actions which are primarily environmental, where the environmental benefit is receiving the focus, or where the environment is the driving motivator.

Climate Change and Resiliency:

In October of 2018 the Intergovernmental Panel on Climate Change (IPCC) released a special report titled G*lobal Warming of 1.5°C*. The report compares impacts at 1.5°C global atmospheric average temperature increases above pre-industrial levels to those at 2°C, the target of the Paris agreement, and outlines the pathways to reach a warming limited to 1.5°C. Across the board, projected impacts of warming at 1.5°C versus 2°C were less severe.

The report stated with high confidence that human activities have already caused approximately 1°C of warming and that if human activities contributing to the warming continue at the current rate, they will likely cause that number to rise to 1.5°C between 2030 and 2052. Historical emissions up until the present will persist and continue to cause climate related changes, such as sea level rise, but are not likely to cause temperature rises of 1.5°C. What this means is that we are not yet "locked in" to this level of global warming and mitigation can be successful in keeping warming to no more than 1.5°C.

There are significant implications to global warming of 2°C rather than 1.5°C. Climate related risks for natural and human systems are higher for 2°C. We have already and will continue to see climate changes related to warming, but the risks seen in the future will depend on the amount of warming that occurs in the future. Risks which will be higher at 1.5°C than at present and higher still at 2°C include temperature extremes, droughts, heavy rains, sea level rise, biodiversity loss, changes in marine habitat, loss in ocean fishery yields, and heat related and vector-borne disease related health risks.

The report recommends that, to limit warming to 1.5°C, CO_2 emissions would have to be reduced by about 45% from 2010 levels by 2030 with net zero reached by 2050 and reductions of 20% by 2030 and net zero by 2075 to stay within the 2°C range. The authors suggest that to limit warming to 1.5°C would "require rapid and far-reaching transitions in energy, land, urban and infrastructure (including transport and buildings), and industrial systems." The authors also suggest that all models which limit global warming to 1.5°C use carbon dioxide removal, such as reforestation and afforestation projects.

The City is and will continue to be vulnerable to many of the risks of Climate Change, notably urban heat, sea level rise, storm surge, and stormwater flooding. Luckily, many of the transitions called for are things within the City's control or influence, such as land use and urban infrastructure. Urban trees, a type of

afforestation, can both remove carbon as well as mitigate heat. The City can also take steps to reduce its own greenhouse gas emissions and take steps to encourage reduction community wide thereby contributing its part to the overall global goals.

Even at the current levels of warming there are impacts, and it is certain City residents will see some level of continued warming and increasing impact in the future. Adaptation and increasing the City's resiliency is necessary. Resiliency can come in the form of finding solutions for living comfortably with the changes. Increased heat may require resiliency in the form of actions to reduce or mitigate the urban heat island as well as take steps to make sure that the most vulnerable community members have access to air conditioning and water on particularly hot days. Resiliency to sea level rise may come in the form of infrastructure changes, some designed to keep the water out and others designed to let the water in. In addition, resiliency can look at the changing face and needs of the City, whether that is mobility for an aging population or job transitions for a clean energy future.

Community Outreach:

Many of the actions within this plan are internal, directing actions by the City to reduce the impact of the City itself on the climate and the environment. There are also actions which focus on the community, either regulations that will impact residents and businesses or incentives and opportunities of which they can take advantage. The key to success of these initiatives will be providing outreach to the community about how they can and why they should participate, integrating public comment and stakeholder engagement in the development of the rules and programs, as well as providing the information and tools necessary to empower the community to act.

Focus Areas

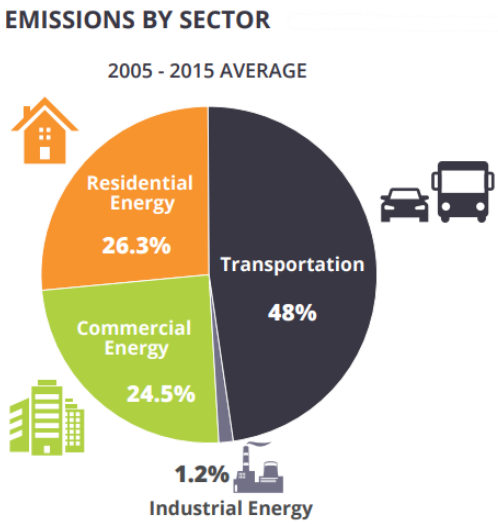
This action plan will focus on seven main areas; resource use, waste, natural environment, the built environment, transportation, climate resiliency, and local government. There are many synergies and co-benefits between these seven areas and, when taken together, they form a comprehensive approach to addressing climate change and protecting the health of our residents, water bodies, and ecosystems.

Goals and Targets:

The Sustainability Action Plan contains several targets within the chapters of the plan. Goals set in this document are general targets, giving a direction towards which to work. One of the outcomes of implementing this plan will be to increase the tracking of many of these metrics.

The City is currently in the process of conducting a greenhouse gas emissions inventory and a climate change vulnerability assessment, both of which will provide science-based targets that can be incorporated into updates and amendments to this plan. A greenhouse gas inventory will help the City to best understand where emissions are originating, develop specific strategies to reduce emissions and track progress in emission reduction. In the meantime, the Compact recently released a regional inventory which showed that in Southeast Florida 48% of direct emissions were from transportation while 50.8% were from commercial (24.5%) and residential (26.3%) energy use. The actions in this plan therefore aim to reduce emissions from these three large categories.

Southeast Florida Regional Climate Change Compact Regional Greenhouse Gas Inventory: Transportation and Stationary Energy, 2005-2015 average (2018).



Similarly, while a climate change vulnerability assessment has not been completed, it is well understood that the general impacts of climate change will include greater tidal flooding, higher storm surge, heavier rainfall, more stormwater flooding, and increased heat. Actions in this plan, therefore, aim to alleviate the impacts of those known hazards. The climate change vulnerability assessment will help to clarify the risks and vulnerabilities, to prioritize actions, and to guide specific metrics.

Boca Raton is one of 9 municipalities that have partnered with Palm Beach County to form the Southeast Florida Coastal Resiliency Partnership (CRP). The CRP will work collaboratively to address issues related to coastal resiliency and leverage pooled resources to attract the best projects, funding, and cost effectiveness. The first work project of the CRP will be a Climate Change Vulnerability Assessment (CCVA). The CCVA is expected to be completed in FY20. The assessment will identify vulnerable assets and populations and prioritize potential actions to mitigate and adapt to the identifies hazards. In the meantime, the plan assumes standard risks of climate change including higher storm surge, tidal flooding, stormwater flooding, and increased heat. The completion of the CCVA will result in recommended actions that can be incorporated into this plan and prioritized as appropriate.

Without a greenhouse gas (GHG) inventory completed, setting specific achievable reduction targets for GHG emissions is challenging. For the purpose of this initial plan, targets for greenhouse emission reductions are based on the IPCC Special Report *Global Warming of 1.5°C* described above. Without more specific information, the targets are set to the minimum reductions from that report. Once the GHG inventory is completed, more specific and ambitious targets will be set.

Metrics	Baseline	2025 Target
GHG emissions; Government Operations	2010 emissions	15% reduction
GHG emissions; Community Wide	2010 emissions	15% reduction

Chapter 1: Resource Use – Electricity and Water

Overview

In the State of Florida, electricity represented 49% of energy use in 2014. In this chapter, electricity will be addressed from two perspectives; the amount that is used and the sources from which it is obtained. Florida Power and Light (FPL) reports that in 2013 they obtained approximately 83% electricity from fossil fuel sources with the remaining from non- fossil fuel sources such as solar and nuclear.

Energy efficiency and renewable energy generation are two powerful tools for mitigating climate change and creating resiliency. According to the World Resource Institute approximately 27% of all the United States' greenhouse gas emissions are related to commercial and residential sector electricity use. To reduce the City's greenhouse gas emissions, reduction of fossil fuel use for electricity by first reducing the amount of electricity used then producing the new smaller amount needed is the best strategy.

Community resiliency can be increased through energy efficiency. With climate change comes warmer temperatures, particularly higher lows and warmer nighttime temperatures. The temperature increase will be most severe in urban areas which are also impacted by the urban heat island effect. With higher temperatures, more energy will be used for cooling. Households in Florida already spend more than four times the rest of the country on energy related to cooling. Reducing the City's contribution to the driving causes of climate change can play a part in reducing rising heat but, more immediately, increasing energy efficiency throughout the community will help to reduce electricity costs as cooling needs increase.

Resiliency to storms can be enhanced through renewable energy. Boca Raton is impacted by hurricanes, with the potential for storms every year. Losing power is not only an inconvenience, it is a health and safety hazard. Increasing the amount of solar photovoltaic (PV) and storage capacity in the City increases those homes and facilities which can be operating after a storm but before the grid is repaired.

The City obtains its water from a single source; the Biscayne Aquifer. This aquifer is surficial, coastal, and utilized by the entire Southeast Florida region from Delray through Miami. Efforts must be put in to place to make sure that water withdraw from the aquifer is sustainable and that the aquifer is protected from pollution and salt water intrusion. This chapter will focus primarily on water conservation and conservation of the aquifer. The quality of surface water bodies will be addressed in the "Natural Environment" chapter.

Water and energy are closely connected. It takes energy to extract, treat, and distribute water and wastewater. By increasing water conservation efforts, energy is saved, reducing fossil fuel use for electricity, and reducing greenhouse gas emissions.

Projects and Programs Previously Completed by the City

- Use of Energy Management Systems (EMS) in City Facilities since 1990s.
- Building energy efficient buildings such as the LEED Silver Fire Station 5 and Downtown Library.
- Replacement of streetlights to LED.
- Capture and reuse of methane gas at the wastewater treatment plant.
- Solar panels generating electricity at Gumbo Limbo Nature Center and Lake Wyman Park.
- Access to Property Assessed Clean Energy (PACE) financing.
- Reduction of per capita water use by 26% since 2005.
- Reuse of 100% of the City's wastewater through *Project IRIS.*

Goals and Targets

1. Reduce electricity used by the City	Reduce City electricity use by 10%
2. Reduce electricity used in the community	Reduce community per capita electricity use 10%
3. Increase electricity sourced by clean renewable sources	20% of City electricity from renewable sources.
4. Reduce consumption of potable water	Reduce per capita water consumption by 5%

Actions

Reduce Electricity Used by the City

Energy efficiency reduces the amount of electricity used and saves the City money, satisfying the City's strategic plan objective of efficient and cost-effective delivery of City services. (Goal 1). To accomplish this, the City's comprehensive plan calls for the City to track energy use and to develop strategies for reducing government energy use. (POLICY CON.6.1.3 and POLICY CON.6.1.4). Retrofits and energy efficient construction can improve the efficiency of a building, but the behaviors of the occupants play a big role as well.

> **Identify opportunities to retrofit City facilities for energy efficiency.** Assess the improvements that could be made to existing facilities to improve energy efficiency such as equipment upgrades, LED lights, and strategies to maximize the benefits of the EMS systems through scheduling. Create a plan to implement the improvements and consider energy savings in CIP prioritization.
>
> **Educate City staff in sustainability and energy and water conserving behaviors.** Create messaging for City staff related to energy and water conservation at the office and at home.

Reduce electricity used in the community.

In a later section actions are laid out to ensure that new buildings are energy efficient but increasing efficiency of existing buildings will also have a large impact. By measuring how buildings use energy and water, goals and strategies can be set to make them more efficient.

Partner with building owners to measure and disclose energy and water usage. Using existing platforms, such as the EPA's Energy Star Portfolio Manager, develop a program by which commercial and multifamily buildings can report energy and water usage. Pilot a voluntary program that takes the information provided and gives feedback on relative building performance and possible upgrades and fixes to improve. Take data on energy and water performance improvements of existing buildings and consider creating an ordinance which requires disclosure, allowing potential tenants to compare energy and water costs, and driving market demand for more efficient buildings.

Assess strategies to increase high impact building improvements. Review the City's code to identify opportunities to upgrade building efficiency through windows, doors, insulation, and HVAC equipment at trigger events such as renovations and transfer of ownership. Identify several high impact strategies and provide information and incentives at the time of building permits to encourage voluntary upgrades.

Offer incentives for home energy audits. Create an incentive program to support home owners and residential property managers to conduct energy audits and implement suggested upgrades. Encourage the use of Home Energy Scores at the point of sale.

Provide education to homeowners and renters on energy efficiency. Create an education program that helps residents learn about no and low-cost upgrades that can be made to save money on their electric bills. Elements of the program may include workshops for renters, kits that can be checked out of the library, and include information about larger investments.

Conduct outreach and gather input regarding community energy goals. For each of the community energy goals there is a need to engage the stakeholders including developers, property managers, home owners, landlords, and residents of affordable housing. Energy costs are a major expense for low income residents and engagement to identify the best ways to lower costs and improve efficiency for all community members must be conducted.

Increase electricity sourced from renewable sources.

The City's strategic plan calls for Boca Raton create an environment to foster economic development growth (Goal 1). Solar Energy is one of the fastest growing industries and job markets and solar installer one of the fastest growing jobs in the state. According to the Solar Energy Industries Association, the number of jobs in the solar industry more than doubled from 2012 to 2017 and solar companies operate in every US state adding $17 billion to the US economy.

Certify as a SolSmart community. Utilize the SolSmart certification to identify areas of improvement in terms of zoning and permitting which streamlines and removes barriers from adopting solar.

Create a solar policy for new City construction. Research options and implement a policy which would require solar to be considered for new construction and new projects within the City. Consider opportunities such as building City facilities to be s*olar ready*, requiring a certain amount of electricity generation relative to project size, and requiring the cost of solar PV and solar water heating systems to be considered as part of the CIP process. Develop a standard solicitation for solar energy installations.

Identify opportunities to include solar energy on existing City facilities. Assess City properties to identify the opportunities to install solar PV or solar heating systems. For example, the Utility Services Department uses approximately 70% of the electricity purchased by the City and has large facilities where solar photovoltaic systems could be constructed. Identify funding for installation of solar and initiate demonstration projects.

Utilize solar + storage for post hurricane resiliency. Assess opportunities to utilize solar PV systems for resiliency and recovery after a storm. Identify remote infrastructure, such as pump stations, that could utilize solar, freeing up staff time from replacing and recharging batteries. Identify locations that would be useful for residents to cool off, charge electronics, access the internet, or obtain hot food as opportunities for solar + storage.

Create incentives for solar energy systems. Identify opportunities to incentivize solar systems such as rebate programs, reduced permit fees, or expedited permitting.

Create requirements for solar energy systems. Pass an ordinance which requires solar PV or solar thermal for new buildings. Consider requirements for new roofs to be built solar ready and for developments of certain types and sizes to include solar systems.

Conduct outreach and gather input regarding solar goals. Increasing solar in the community will take significant buy in from the community stakeholders. The City will engage developers, property managers, homeowners, landlords, and low-income residents in developing the programs, incentives and requirements proposed in this section. The City will also develop educational materials on solar technologies, financing, and co-op opportunities to encourage voluntary adoption.

Reduce consumption of potable water.

The City's comprehensive plan has water conservation education as a priority (POLICY INF.1.3.6). Water and energy are closely related as it takes water to generate electricity and electricity to move and treat water. The City has made many improvements to water consumption, through education and landscape practices more can be achieved.

Continue community education regarding water conservation. Continue to message to the community regarding reasons and methods to conserve water. Include water conservation tactics where appropriate in energy efficiency discussions. Assess the interest in offering a low flow fixture rebate.

Create a policy to require drought resistant landscaping in City properties. Create a policy which outlines strategies to reduce irrigation on City properties including expanding the use of native and drought tolerant species.

Revise the landscape ordinance to increase water conservation. Revise the landscape ordinance which includes provisions intended to increase water conservation. Provisions may include limits to sodded areas, specifications on irrigation systems, increased shade tree canopy, and requirements for native and drought tolerant landscape plant selection.

Regional Climate Action Plan 2.0

The City signed on to the Mayor's Climate Action Pledge of the Southeast Florida Regional Compact on Climate Change (Compact) in May of 2017 stating that the City will integrate the Compact's Regional Climate Action Plan (RCAP) into sustainability plans, comprehensive plans, and other plans as appropriate. The RCAP provides a common framework and common goals for the region to address the challenges of climate change within separate organizations but in a comprehensive and cohesive manner and can be found on the Compact's website (southeastfloridaclimatecompact.org).

The Resource Use Chapter incorporates the following recommendations from the RCAP:

EF-2: Advance energy efficiency and conservation.
EF-3: Increase access to energy efficiency.
EF-6: Streamline permitting and administrative processes.
EF-8: Build future energy capacity.
RR-12: Promote renewable energy and storage.

Case Studies

Sierra Club's Ready for 100 Campaign. *At the time of writing, across the Country, 125 cities have signed on to say they are Ready for 100% renewable energy. The commitments come in the form of statements of support for a 100% goal to detailed strategies to transition city operations and then community wide energy use to renewable (including offsets and credits). The city of Aspen, CO is one of six cities in the United States that has already met their 100% goal. Aspen obtains 46% of its electricity from hydroelectric plants, 53% from wind, and the remaining from solar and landfill gas. Georgetown, TX, has met their target for 100% renewable energy using wind and solar, including a 154-megawatt solar farm.*

Cambridge, MA Building Energy Use Disclosure Ordinance. *After learning that 80% of their greenhouse gases came from buildings, the Cambridge, MA City Council passed the Building Energy Use Disclosure Ordinance in 2014 requiring large buildings, including commercial, multi-family, and government, to track and report their energy usage. Disclosure places the information in the marketplace, where various users such as potential buyers, tenants, realtors, and energy service providers can use the data to make decisions, creating a value to energy efficiency in such buildings. The City utilizes the existing Portfolio Manager data tracking platform through the U.S.EPA reporting. According to the Cambridge website: "The City of Cambridge has a deep commitment to reducing energy use and greenhouse gas emissions" said Assistant City Manager, Iram Farooq. "The data in these reports will help us better understand energy use in Cambridge buildings and create strategies to improve energy performance."*

Chapter 2: Waste

Overview

Materials in our waste stream have embedded energy from their production and transportation. Once disposed, hauling, landfilling, and decomposition also represent energy inputs and greenhouse gases released. The production of waste in the first place is an indicator of inefficient levels of consumption.

Waste reduction is often explained using the three "R's," Reduce, Reuse, and Recycle. This phrase is meant to be a process, listing each as a step to be done in order. The first step is to reduce the waste that is produced. This can be accomplished through more conscious consumption and decisions about the lifespan, packaging, and durability of a necessary product. Reuse recommends that we find ways to repurpose or fix items rather than trading them for something new. Recycling is the act of taking the materials used and turning them in to something else. Materials which are difficult to or cannot be recycled and which are not able to be reused should be avoided.

Recycling is the last step of the process. When waste is produced that can be recycled, it should be, but recycling does not solve the environmental and societal issues with waste in the first place. One example is plastic. Although most recycling programs accept at least some forms of plastic, an estimated 91% of all the plastic disposed of since 1950 has not been recycled.

All waste produced represents within it a certain amount of embedded energy and therefore an embedded climate impact. Reducing waste reduces the demand for energy use, raw material extraction, and transportation. Increasing recycling reduces the energy and climate impact of extracting new materials. Waste management requires movement of waste from homes and businesses to places of disposal and containment. The less there is to move, the less fuel is used and fewer greenhouse gas emissions are produced in the process of hauling.

In addition to the climate impacts listed above, waste can provide a resiliency challenge by being a physical barrier to the movement of water when litter enters drainage systems. Reducing waste overall and particularly non-biodegradable waste should reduce the chance those materials become litter. The City contracts for waste removal from the City's canals and waterways, removing hundreds of pounds weekly. While cleanup efforts are important, they do not get to the root of the issue; the waste itself. Plastic bags,

bottles, and other trash can block the flow of water or the proper functioning of flood prevention structures.

Projects and Programs Previously Completed by the City:

- Promotion of the "Recycle Right" campaign to reduce recycling contamination and maintain recycling markets.
- Promotion of waste reduction campaigns such as Plastic Free July and Coastal Connection Restaurant program.
- Reduction of paper by online permit submittal and electronic building plans.
- Streamlining of processes in the City such as purchase agreements and Council agendas to reduce paper use.

Goals and Targets

5. Reduce the amount of waste produced. 6. Increase waste diversion rates. 7. Reduce litter and plastic pollution.	Reduce solid waste tonnage by 20% Increase recycling revenue shares by 10%

Actions

Reduce the amount of waste produced.

Reduce paper use in the City. Identify ways to eliminate the remaining paper plans used for review. Process signatures on ordinances, resolutions, and RFPs electronically to avoid printing. Provide tablets to each of the Council Members as well as City staff on which to view the agenda books rather than printing for each meeting. Encourage paper use reduction in smaller ways through email signatures, printer settings, and general behavior change.

Improve the waste and recycling behaviors of City employees. Develop consistent messaging to staff to let them know how and why to recycle as well as empowering employees to improve the recycling infrastructure available at their work site. Identify waste streams which could be converted, such as obtaining a contract for a cardboard dumpster at City Hall.

Promote waste reduction through education. The City can, through the website and social media, promote waste reduction goals and tips.

Revise the construction and demolition debris ordinance. Consider an ordinance and other ways to require or incentivize the diversion and reuse of construction and demolition debris.

Reduce food waste produced. The USDA estimates that 30-40% of the food produced in the United States is wasted. The production of food is land, water, and energy intense and reducing food waste has been identified as a major strategy for reducing emissions contributing to climate change. Create outreach strategies to educate residents and students on food waste and strategies for food waste reduction.

Increase Waste Diversion

Require space for recycling in new development. Ensure that new construction and major renovations have areas dedicated for recycling collection included in the plans to facilitate the ease of establishing a recycling program.

Educate building managers about recycling. Conduct outreach to multifamily properties and office buildings. Develop a toolkit with step-by-step guidance of how to contract with an approved hauler and set up a recycling program for the building.

Create requirements for commercial and multi-family recycling. Pass an ordinance to require multifamily and commercial properties to include recycling programs available to tenants and customers.

Increase participation in residential recycling. Identify neighborhoods and individual customers that are not utilizing the recycling service and target those homes and neighborhoods for outreach. Develop an internship or study with a local university.

Reduce contamination. Identify neighborhoods and individual customers that have higher rates of recycling contamination and target those homes and areas for outreach. Develop an internship or study with a local university.

Encourage composting of organic waste. According to the USEPA food waste represents approximately 20% of what enters landfills nationally. Instead of putting organic material into the waste stream, food scraps can be composted and used as soil amendments for gardens or potted plants. Educate the community on organic composting through community garden workshops.

Compost municipal landscaping material. Create a pilot program to compost on City property using landscaping waste from City facilities. Create compost using seaweed from the beaches when there is excess on the beaches. Investigate opportunities to create soil amendment using landscape materials as well as biosolids from the wastewater treatment plant.

Conduct outreach and gather input regarding recycling goals. The success of proposed requirements for recycling will take buy in from the impacted stakeholders. Conduct outreach to gain input on barriers and opportunities to guide policy and program design.

Reduce litter and plastic pollution

The City's Strategic Plan promotes the principle of the City being beautiful by design, with clean and litter free being one of the criteria called for. An important part of reducing litter is reducing the types of items that become litter, such as single use disposable plastics.

Continue to grow the Coastal Connection program. Grow the Coastal Connection program to expand from restaurants to include other opportunities for waste reduction.

Continue community education related to plastic pollution and waste. Continue to utilize opportunities to educate residents, businesses, and students in the City of plastic pollution and strategies to reduce single use plastic waste.

Case Studies

Seattle, WA Zero waste goals and recycling engagement. *The City of Seattle has adopted a mandatory commercial and multifamily recycling ordinance, passed a zero-waste resolution, developed a zero-waste strategy, and continues to increase and revise its recycling goals. To support the mandatory recycling, the City created a full-time enforcement position as well as conducted outreach and studied the effectiveness of implemented programs.*

Chapter 3: Natural Environment

Overview

Boca Raton's parks are distinctive to its character. The Beach and Park District and Recreation Services maintain over 1500 acres of parks including 396 acres of inland parks, 148 acres of beach parks, and 420 acres of conservation areas. All the City's roadways and open spaces are maintained by Recreation Services to create a feel of being within a park even as you drive down a busy road. A large portion of the land in the City, however, belongs to private landowners. There are many opportunities for residents to contribute through their own landscaping and practices in their own yards and neighborhoods.

Although Boca Raton is an urban and suburban community, nature doesn't only occur in our preserves. An urban area can have a positive impact on the local plant and animal life. In this section "nature" will include tree canopy, landscaped habitats, and inputs of pollution that impact the waterways, air, and natural communities around Boca Raton.

Maintaining nature in a city has many benefits. Increasing wildlife habitat through native landscape choices increases local biodiversity and enhances residents' ability to view butterflies, wading birds, and migratory birds. Tree canopy has been demonstrated to make neighborhoods safer and to increase property values. Scientists continue to discover the ways that time spent in nature, even urban versions, improves health, productivity, mood, and creativity. The plants and trees around us are also busy scrubbing toxins out of the air and water, improving the health or people and ecosystems alike. One of the major drivers of climate change is land use change, essentially taking more productive land and changing it to less productive uses in terms of photosynthesis and carbon absorption. By incorporating more green space, plant material, and particularly trees into the urban space it allows for carbon sequestration to occur in urban spaces. The IPCC's 2018 report on the impacts of warming indicated that to prevent the worst of the warming, practices will need to be put in to place which remove carbon from the atmosphere. Urban trees can fill part of this role.

Increasing tree canopy will help to mitigate Urban Heat Island Effect. By providing shade, trees prevent the heating of dark colored impervious areas such as roads and parking lots. Shade on buildings reduces energy used for cooling, both mitigating the economic impact of warmer temperatures and preventing additional warming from the running of air conditioners. Trees cool the air through the process of evapotranspiration. Trees also absorb stormwater, helping prevent stormwater runoff and flooding, a service which will be important in a future of heavier rainfall.

Water intensive landscapes, such as lawns and exotic ornamental plants, are also intensive users of fertilizers and pesticides. Runoff from pervious area and laws adds to pollution of our waterways, reducing water quality.

Projects and Programs Previously Completed by the City:

- Outreach programs helping residents maintain their trees in a sustainable way.
- Annual tree sales through the Beautification Committee's Project Shade Tree.
- Pilot programs in beachfront parks on the barrier island to reduce herbicide use and use organic products.
- Sugar Sand Park includes a butterfly garden and demonstration area certified as wildlife habitat through the National Wildlife Federation's Garden for Wildlife program.
- Seven public preserves totaling over 500 acres of environmentally sensitive land.
- Park staff are trained in best management practices (GI-BMP) and utilize integrated pest management (IPM) practices to reduce the need for synthetic chemical use.
- Ordinance 5469 mandates Florida Friendly Fertilizer practices and training for all commercially licensed landscapers.

Goals and Targets

11. Maintain and improve air and water quality.	Air Quality Index 100% Moderate and Good
12. Increase tree canopy cover.	Increase tree canopy to 35%
13. Increase wildlife habitat.	NWF wildlife habitats certified increased by 20%

Actions

Maintain and improve air and water quality

The City's comprehensive plan is clear in its dedication to the protection of the intracoastal waterway and the quality of both freshwater and saltwater resources. (POLICY CM.1.1.1 and GOAL CON.2.0.0). plan calls for stormwater systems that can manage the level of discharge for an area; an amount that will increase in the future (POLICY CON.2.1.1) and calls on the stormwater systems to maintain high water quality (GOAL INF.3.0.0) and include natural drainage features (OBJECTIVE INF.3.2.0) as well as supporting air pollution guidelines of the Florida Department of Environmental Protection including effective controls for mobile sources of air pollution within the City (POLICY CON.5.1.1).

Increase the use of green infrastructure in public projects. Utilize green infrastructure to improve quality of stormwater through the City. Consider the inclusion of green infrastructure elements as roads are resurfaced or parks and other facilities are redeveloped.

Review the code of ordinance to allow green infrastructure. Review the City's code to ensure consistency between what is allowed and required and what the City is encouraging and promoting in terms of permeable areas, swales, and rain gardens.

Implement the State's green infrastructure manual. The Department of Environmental Protection is creating a manual to guide the use of green infrastructure and low impact development in Southeast Florida. The manual, *Low-Impact Development & Green Infrastructure: Pollution Reduction Guidelines for Coastal Water Quality in Southeast Florida*, provides a framework for incorporating GI and LID principles and techniques into stormwater plans. The City

can pass a resolution implementing use of the manual for the purpose of incorporating into public projects and guiding private development.

Pass an ordinance to increase green infrastructure. Develop an ordinance or develop incentives to require and encourage more use of LID by developers to manage stormwater. Include education in the building permit review and promote examples of permeable surfaces for flood prevention that exist in the City, such as the pervious pavers at Mizner Park Amphitheater.

Pass an ordinance creating pervious requirements for all zones. Develop requirements for all zones, including single family residential, to include a certain amount of pervious on site and/or to require that a certain amount of stormwater be managed on site.

Reduce vehicle idling through education. Create educational campaigns that educate the community and employees on the impact of vehicle idling on the vehicle's engine, air quality, and health. Target employees driving City owned vehicles and areas around vulnerable populations.

Implement guidelines for the use of leaf blowers. Gas powered leaf blowers generate noise which is both unpleasant and dangerous and are highly polluting creating a hazard to both lawncare professionals and residents. Blowing leaves and grass clipping into streets, storm drains, and canals contributes to water pollution. Consider strategies to reduce the impacts of blowers.

Conduct outreach and gather input regarding pollution reduction strategies. New requirements will be most successful when developed and implemented with stakeholder buy in. Conduct outreach and gather input from communities impacted by pollution, advocacy groups, and those targeted by suggested policies.

Increase shade tree canopy

Tree canopy provides many benefits to the community. Aside from being beautiful, shade cools the surrounding area making it more comfortable to walk and bike, slows rainfall and helps prevent stormwater flooding, provides habitat for birds, and has even been demonstrated to slow traffic and reduce accidents. The City will promote trees and canopy in the following ways:

Provide incentives for homeowners to plant trees. Provide education to the community regarding the benefits of trees. Create incentives for homeowners to plant trees, such as free tree giveaways at City events.

Require shade canopy trees in zoning regulations. Review the Zoning and Development code for opportunities to increase trees maintained or planted as parcels are developed or redeveloped. Maintenance of existing tree canopy should be a priority for any project, private or public. Increasing shade tree canopy is the priority. Trees should be considered as part of a stormwater strategy. Revise and uphold the Community Appearance Board requirements.

Increase shade tree canopy on public lands. Continue to plant trees on public properties. Develop a policy for City landscaping which prioritizes shade trees, shades pedestrian facilities, and uses trees in stormwater maintenance.

Increase wildlife habitat.

The City is committed to maintaining its parks, facilities, and landscaped areas for the benefit of nature, human health, wildlife, and recreational use. Currently the City uses an IPM policy and has staff trained in Green Industry Best Management Practices. There are over 500 acres of natural areas, wetlands, and environmentally sensitive lands in the City. These areas are important wildlife habitat for many protected species such as the gopher tortoise and the burrowing owl, both listed by the state as threatened, as well as many migratory birds. As isolated islands, natural areas are limited in their ability to sustain wildlife populations. Conscious landscaping choices on public and private land can help to expand and create connections between these habitats.

Adopt a Florida Friendly Landscaping policy. Implement Florida Friendly Landscaping in more parks and public spaces around the City for reducing water, fertilizer, and herbicide needs and enhancing the diversity of native plants.

Control invasive exotic species. In managing natural areas, the City will continue to use the most effective techniques available to control exotic invasive plant species. Options may include partnering with organizations such as the Institute for Regional Conservation to organize volunteer efforts for the maintenance and restoration of native plant communities.

Certify wildlife habitat. Pursue community habitat designation through the National Wildlife Federation by designating public facilities as habitat, encouraging schools, businesses, and homeowners to certify habitat, and educating the community on gardening for wildlife.

Consider opportunities for beneficial wildlife attracting programs. Look for opportunities on City properties or with partner organizations to install bat boxes and beehives to support populations of those or other groups of species.

Case Studies

Portland, OR Green Streets: *In order to protect water quality in their river from runoff from City Streets, the City of Portland, OR's Environmental Services Department instituted a policy of "Green Streets." In areas where stormwater flooding is problematic, Portland designs streets to include water capture in the landscape design, treating the stormwater using the natural processes of plants and street trees. The Green Streets solve multiple problems, they reduce stormwater flooding, improve water quality, as well as provide aesthetically pleasing roadways which provide better infrastructure for pedestrians and cyclists. The City of Portland has been incorporating green infrastructure into stormwater management since 1992.*

National Wildlife Federation Community Habitats: *The National Wildlife Federation's Garden for Wildlife program provides guidance on five garden principles that help landscapers foster use by wildlife. These pockets of habitat provide important stopping points along migration routes and essential connections between larger natural areas and parks. NWF recognizes Community Habitats knowing that the more backyard habitats there are the better the connections, and fostering connections requires a community effort. Cities qualify as community habitats if a certain number of homes, schools, businesses, and government properties are certified through the Garden for Wildlife program. Community Habitats also provide education and outreach to their community to promote the program.*

Chapter 4: Built Environment

Overview

The design of a City and the buildings within it are major ways that a City impacts the environment. 70% of the electricity used in the United States is used by buildings. Buildings account for around 40% of the greenhouse gas emissions in the United States. Most of these emissions and electricity use are from heating, cooling, lighting, appliances, and electrical equipment. Improving efficiency and transferring some of those processes to passive design or clean energy can do a lot to improve the climate impact of a building. Designing buildings to be more efficient and to compliment and improve the environment around them will help reduce that contribution to greenhouse gas emissions. Because buildings are long term investments, designed to last 50 years or more, the efficiency embedded in the design of the building has a lasting beneficial impact. Designing Cities to accommodate mixed uses, transit, and non-motorized modes of transportation encourages residents to choose these modes, reducing emissions from vehicles.

Projects and Programs Previously Completed by the City:

- The City has two LEED silver buildings, Firehouse #5 and the Downtown Library.
- In 2017 the City added a requirement to include electric vehicle charging stations to commercial development into the Land Development Regulation.

Goals and Targets

13. Increase green buildings. 14. Reduce light pollution.	100% of new City buildings built to green standards

Actions

Increase Green Building

The City's Comprehensive Plan calls for the adoption of a green standard as official minimum criteria for new government buildings (POLICY CON.6.2.2). The City has demonstrated commitment to building to green standards. Fire Station 5 and the Downtown Library have both been built to LEED Silver. The City will continue to build future new facilities and renovations to green standards. The Comprehensive Plan calls on the city to offer incentives for FGBC or LEED certified commercial and institutional buildings,

Energy Star certified green homes and/or FGBC certified green developments (POLICY CON.6.2.6). The City will encourage and incentivize private developers to build new projects and major renovations to green standards in such a way as to keep the intention of the policy while allowing for changing green building technologies, best practices, and certification options.

Pass a resolution to build City facilities to green standards. Pass a resolution committing the City to green standards for new facilities. Define the standards according to existing third-party certifications or specific standards determined by the City.

Institute a green building fee. For new commercial developments of a designated size, require a green building fee to be paid. Determine a system to refund the fee if the building meets set green building standards, such as a level of LEED certification. Define the use of revenue from the fee such as funding energy efficiency rebate programs.

Add green building requirements to the zoning code. As green building practices are determined to be beneficial to the community and desirable for all new buildings, add requirements within the zoning codes for specific green building practices.

Develop incentives for new development to achieve higher green building requirements. Standard incentives offered include expedited reviews, reduced parking minimums, increased height or density. Consider a mix of incentives which encourage more green building and the creation of affordable workforce housing.

Conduct outreach and gather input regarding green building programs. Develop policies and incentives with input from builders, developers, and other stakeholders. Engage the community to ensure that new policies add to and do not take away from the affordability of housing.

Reduce Light Pollution

Artificial lighting at night impacts human health, safety, and the environment. While the rapid conversion of street lighting to LED technology is saving cities money and reducing carbon emissions related to electricity, depending on the color temperature of the light LEDs may be contributing to health issues. The American Medical Association recommends that people limit their nighttime exposure to blue light and recommend LEDs with color temperatures of no more than 3000k. Fixtures which allow lights above 45°-90° waste energy and create sky glow without generating any benefit. Sky glow has implications for wildlife, from changing migratory bird patterns to confusing hatchling sea turtles. Even with vegetated dunes and strict rules for lighting on the waterfront, the sky glow from lights in other areas of the City continues to influence hatchling turtles. Glare which may be caused by lights that are too bright or from a visible light source can create deep shadows, impair vision, and create an unsafe environment where hazards are not easily perceived. The Crime Prevention through Environmental Design (CPTED) program discourages glare and recommends lights be fully shielded and directed to the areas where light is needed.

Use night friendly lighting at City facilities. The City shall create a policy whereby all lights on City facilities are fully shielded and directional and whereby street lights are shielded, minimizing uplight and glare, and are at a color temperature of 3000K or less.

Educate residents and businesses on the lighting ordinance. The City shall continue education for residents and businesses on the existing lighting ordinance which requires lights to be shielded and for light sources to not be visible off property. Education will encourage residents to choose appropriate lighting as well as to help the City identify non-compliant lighting.

Update lighting ordinance. Improve the existing lighting ordinance to consider lighting not now addressed, such as ornamental up lighting for buildings and signs.

Regional Climate Action Plan 2.0

The Built Environment Chapter incorporates the following recommendations from the RCAP2.0:

ST-8: Adopt green building standards.

Case Studies:

Miami Beach, FL Sustainability Fee: *The City of Miami Beach is investing in the future of its community by requiring all new development over 6,000 sf pay a Sustainability Fee equal to 5% of the construction costs of the project. This fee is refundable if the project meets green building certification standards. 100% refund is given for building achieving LEED Gold or the Living Building Challenge certifications. The refund amount is decreased for lower levels of certification. Funds available from the fee can be used on sustainability and resiliency projects in the City such as adapting infrastructure for sea level rise.*

Chapter 5: Transportation

Overview

In the State of Florida, transportation represents 37% of energy use. Nationwide, emissions from transportation account for 33% of all greenhouse gas emissions. The transportation system in the United States is overwhelmingly powered by fossil fuels. Changing the types of vehicles and fuels as well as reducing vehicle miles travelled will decrease the impact of this sector.

Mixed used development and improvements in transit help a community become more resilient. In the event of a storm, there are more services and basic needs available in a smaller area. The better transit options are, the better residents can age in place. Transit options as well as safe biking and walking infrastructure make the City more navigable by the young, old, and disabled.

Projects and Programs Previously Completed by the City:

- Boca Raton is recognized as a Bronze level Bike Friendly community.
- The City has an active community advisory board dedicated to bicycle and pedestrian issues.
- The Tri-Rail connects visitors, students, and employees to the City's downtown through the new Palm Tran Route 94 and several shuttles.
- The City has installed electric vehicle chargers at the Downtown Library and City Hall and has passed an ordinance requiring new developments to include electric vehicle charging station.
- Planned Mobility Districts have been created throughout the City to encourage multiple and mixed-use development and patterns that encourage the use of alternative transportation.

Goals and Targets

16. Increase alternative fuels.	Reduce City fleet fuel usage by 20%.
17. Decrease vehicle miles travelled in City.	Reduce workforce commuting by single occupancy vehicle by 20%
18. Decrease vehicle miles travelled by staff.	

Actions

Increase the percentage of vehicles powered by alternative fuels.

The City has direct control over the vehicles within its own fleet and indirect control over private vehicles. The City can reduce the impact of its own fleet by creating policies for the purchase of alternative fuel vehicles and encouraging fuel efficient practices. The City can reduce fuel used in private vehicles through policies which make it easier to utilize alternative fuels and which discourage inefficient driving.

Develop a sustainable fleet policy. The City should explore a fleet policy that requires sustainable procurement of vehicles such as right sizing the fleet and purchasing electric and hybrid vehicles and a policy that encourages sustainable fleet maintenance through route design, technology, and employee behavior.

Increase the public electric vehicle charging network. Continue adding charging stations to public facilities such as libraries, municipal buildings, parks, and beaches.

Reduce vehicle miles travelled (VMT) in the community.

Transportation choices are made based on many factors, convenience being one of them. Zoning and development which mixes uses, putting multiple uses within proximity of each other, eases the transition to transit, walking, and biking by making those choices more convenient. This strategy is supported by the comprehensive plan which states that to help reduce greenhouse gas emissions, the City shall support multiple modes of transportation (POLICY CON.6.1.1) and provide for balanced growth, economically beneficial land uses, and the health and safety of residents, through development that embraces improved transportation, land use, connectivity and design characteristics that facilitate mobility options (GOAL LU.4.0.0). The Comprehensive Plan also encourages the development of affordable housing particularly in proximity to transit stops (POLICY HO.1.2.104).

Utilize data to develop strategies to reduce Vehicle Miles Travelled. Using the GIS units in City vehicles, study routes and idling habits to develop strategies to increase efficiency of the City fleet. Utilize applications that analyze how people move around the city to inform strategies.

Develop zoning regulations that encourage mixed use. Development models which require separation of uses encourage sprawl and usually require single passenger vehicles to navigate. Developing zoning codes that allow for mixed uses encourages development where residents can live, work, and play within the same area, reducing the need for car travel.

Develop zoning regulations which encourage affordable workforce housing. The closer that people live to where they work, the less miles they will have to travel or the more likely they will be to walk, bike or use public transit. In order to reduce VMT in Boca Raton and alleviate traffic, identify strategies to include in zoning regulations which would increase workforce housing.

Study potential shuttle routes. Many of the transit options in the City of Boca are regional. The Tri-Rail and the PalmTran move through the City and connect it to other regional locations. Efficient movement via transit within the City is not as available. The City should study potential shuttle routes or on demand mobility that would most efficiently move people from places of interest including residential areas, recreational areas, and areas of business. Stakeholders should

be consulted to determine who would be most likely to use the service and for whom it would have the most benefit. Specific routes could be piloted for a set time to assess ridership potential. One route consideration might be one which would connect places of natural and cultural interest, such as a loop that visits the beach, nature centers, parks, and museums in town.

Pass a complete streets policy. Explore sample complete street policies and select location to pilot designs. Include complete street elements in all new road design.

Complete a bike and pedestrian master plan. In order to address connectivity across the City and best create a comprehensive plan that will increase the frequency and safety of bike and pedestrian travel, consider a bike and pedestrian master plan.

Conduct outreach and gather input regarding mobility policies. Engage stakeholders in the development of transit routes and zoning regulations to make sure that they are working for the community and those who could best benefit or be most impacted.

Reduce Vehicle Miles Travelled by City Staff

Institute a city carpool program. Develop a carpool program that includes emergency rides home as well as provides additional incentives.

Provide incentives for using transit. Continue to participate in the TriRail's discount program. Encourage employees to use the TriRail by providing a shuttle to and from the station. Alternatively, organize groups of employees who are on the same train schedule to use a City vehicle to get to and from the train station, parking the vehicle overnight.

Use electric vehicles for work related travel. Increase the number of fully electric vehicles available for general staff to use on City business. The availability of a vehicle for work may increase the likelihood that staff will leave their personal cars at home.

Create flexible work policies. Consider policies which would allow employees in certain positions to periodically work remotely from home. This would reduce the miles travelled by these employees. In addition, alternative work schedules for some employees could reduce commuting miles and alleviate rush hour congestion around City Hall.

Regional Climate Action Plan 2.0

The Transportation Chapter incorporates the following recommendations from the RCAP2.0:

EF-11: Establish fuel-efficient municipal vehicle fleets.
EF-12: Promote Electric Vehicles.
ST-10: Shape development through transportation planning.
ST-12: Design sustainable and equitable transportation systems.
ST-18: Increase the use of transit.
ST-19: Promote bicycle and pedestrian facilities.

Case Studies:

South Bend, IN Smart Streets*: One of the 2017 Smart Growth America "Best Complete Streets Initiatives" designation, South Bend's project redesigned seven major roadways, spurring around $100 million in new investment in the downtown. The improvements include smart traffic signals which use thermal*

technology to detect people and vehicles, LED lights embedded in the pavement, and porous pavement for stormwater management.

Hollywood, FL Extended Service Hours program: *The City of Hollywood, Florida, conducted a pilot study in FY17 to investigate the effectiveness of a 4-10 work week and open hours for City Hall and related services. The extended service hours allowed residents and businesses to do business with the City, such as paying utility bills and applying for permits, from 7 am to 6pm four days a week. These extended hours are intended to make it easier for this business to be done outside of 8-5 when people are typically working and would need to take time off to conduct this business with the City. At the end of the pilot program the City realized $459,088 in saving related to water use, electric, fuel, overtime, and sick leave usage. The program was run along with campaigns with staff on water and energy conservation while at work. In addition, staff are encouraged to schedule doctor and other appointments on their day off instead of during work hours. Employee satisfaction surveys taken before and after the implementation of the 4/10 work week indicated that employee happiness increased and, more significantly, employees who said they were unhappy decreased. In addition, fewer employees stated that they were not able to manage their current job responsibilities within their work schedule and more said that they could after the 4/10 schedule was implemented. The number of employees who rated their emotional and mental condition regarding ability to handle difficult challenges at work as very high with an increase of several percentage points. Overwhelmingly employees rated that they were "very happy" or "happy" with their work schedule and those who rated their work life balance as "very good" increased by 71%.*

Chapter 6: Climate Resiliency

Overview

Future conditions are expected to be different than conditions today. Water will be a part of the urban environment as never before. Sea levels are rising, storms are becoming wetter, and groundwater getting closer to the surface. Heat will increase globally and even more so in cities as pavement and other dark colored impervious surfaces contribute to the urban heat island (UHI) effect. The built environment will need to adapt to these changes, allowing for more water and mitigating the extra heat.

Actions such as those listed in this section are taken into consideration in the calculation of the City's Community Rating System (CRS) score through the Federal Emergency Management Agency (FEMA). FEMA's CRS scores range from 1 to 10 with 1 being the best. A community's flood insurance rate may be lowered commiserate with a lowering of its CRS score. The City currently has a CRS score of 8, earning residents a 10% discount on flood insurance. A CRS score of 6 would increase that discount to 20%. Actions taken which reduce flood risk not only make the City more resilient to flooding but alleviated the financial burden of flood insurance on its residents.

Projects and Programs Previously Completed by the City:

- The City has begun to build sea walls to a higher level, matching the seawall requirements of nearby communities.
- The City is involved with the Coastal Resiliency Partnership (CRP) of Palm Beach County to work on regional resiliency.

Goals and Targets

19. Mitigate drivers of climate change. 20. Adapt to future conditions. 21. Reduce heat impacts on the community.	Reduce GHG emissions 15% by 2025.

Actions

Mitigate drivers of climate change.

The City's comprehensive plan directs the City to monitor and control point source and non-point source emission of greenhouse gases and other air pollutants (OBJECTIVE CON.6.1.0). Most of the actions throughout this plan have a benefit of reducing greenhouse gas emissions and therefore reducing the

City's contribution to the driving causes of climate change. Greenhouse gas inventories from the region and from similar sized communities shows a relatively consistent split of emissions sources. The largest source is transportation, the second largest being building energy use split between commercial and residential. Waste and industry are smaller portions. The City can expect their split to be similar and can identify actions which reduce transportation emissions and emissions from buildings. In order to measure progress, however, an individual GHG inventory is necessary.

> **Measure greenhouse gas emissions.** Hire a consultant to conduct a greenhouse gas emission inventory for the City and help identify strategies and targets for GHG reduction. Repeat the inventory annually or as frequently as possible.

Adapt the built environment to future conditions.

While it is well understood that climate change will result in future conditions which will be different from what we are experiencing today, it is not certain the exact form and magnitude those changes will take. Projections of sea level rise and climate scenarios exist and can and should be used to plan future development and adaptation actions by the City. The City has worked hard to earn and maintain a AAA bond rating. Large credit agencies such as Moody's are beginning to consider a City's understanding of and preparation for climate risk as they rate communities. Two hazards that stand to cost communities are increasing temperatures and sea level rise. The City, a coastal City in the Southeastern United States, is vulnerable to both hazards. Maintaining the AAA bond rating is one of the objectives of goal 1 of the strategic plan; Financially Sound City.

> **Conduct a vulnerability assessment.** As part of the Coastal Resiliency Partnership (CRP) of Palm Beach County the City is engaging with 9 other municipalities and the County to conduct a regional climate vulnerability assessment.
>
> **Implement a resiliency action plan***.* As an amendment to this current sustainability action plan and an input to future sustainability action plans, create a plan to implement recommendations based on the results of the vulnerability assessment.
>
> **Consider sea level rise projections in stormwater system designs.** Consider the creation of standards for calculating stormwater management to take in to account current groundwater levels and potential future groundwater and rainfall conditions with projected sea level rise. This will include green infrastructure and nature-based solutions.
>
> **Study the feasibility of collecting stormwater for reuse***.* Investigate the possibility of expanding the IRIS system to include reclamation of stormwater.
>
> **Adopt building requirements in the zoning code that increase resiliency.** Resiliency of a coastal property may come from infrastructure investments or from building design of the structures on the property. Identify opportunities to change requirements to increase the resiliency of the property. Possible areas to focus is on seawall height, allowing higher finished floor elevations before calculating height, designing parking on ground floor, and other resilient designs.

Mitigate the Urban Heat Island Effect

Floridians use four times as much energy on cooling as the rest of the country Hard, dark colored, impervious surfaces increase the temperatures in an urban area by absorbing light and radiating heat. The

Urban Heat Island impact can be reduced by eliminating some impervious areas and making sure others are shaded or cool. A dark colored roof gains heat, increasing the local UHI as well as increasing energy costs for the building occupants, increasing heat associated with the HVAC system and greenhouse gas emissions from electricity use. Roofs contribute to stormwater runoff and pollution. A cool roof is one designed with light colored or reflective surfaces to prevent heat gain. A green roof is also cool but utilizes plant material to also capture and filter water and potentially provide green space, air quality improvement, and wildlife habitat. A blue roof is also cool stores rainwater for use in and around the building. Solar roofs not only shade the roof structure with PV panels, reducing heat gain for the building, but also offset building electricity use. All new construction, city facilities, and renovations should include some sustainable features to maximize the benefits of underutilized roof space.

Shade impervious areas. Address the land development code and the requirements for trees in new development to ensure that trees added are increasing canopy cover and strategically placed to cool buildings and pavement. Consider the use of green walls to further cool buildings.

Increase pervious area. Consider design requirements which increase pervious area in developments. Examples may be reduction of parking requirements, requirements of green or pervious parking, pervious pavements, and green roofs.

Use cool pavement. Create incentives that, when pavement is necessary, encourages the use of pavement types which are certified as "cool" pavements.

Create a sustainable roofs ordinance. Roof area is underutilized space that could be working towards sustainability goals. Develop an ordinance to require new and renovated roofs in the City to include sustainability features such as solar PV, solar thermal, green roofs, and cool roofs.

Regional Climate Action Plan 2.0

The Built Environment Chapter incorporates the following recommendations from the RCAP2.0:

ST-1: Incorporate Sea Level Rise projections in to plans.
ST-7: Incorporate risk-reduction strategies in to planning.
RR-1: Identify at risk populations and infrastructure.
ER-2: Advance infrastructure standards.
RR-11: Promote policies to reduce flood risks.
NS-7: Promote coastal natural systems.
PH-4: Reduce extreme heat exposure.
NS-14/ST-15: Promote urban tree canopy.

Case studies

City of Miami Beach Urban Heat Island Ordinance. *The City of Miami Beach passed an Urban Heat Island Ordinance which creates incentives and requirements for sustainable roofs, such as green roofs, solar carports, and permeable or high albedo pavement. By providing incentives and requirements for building features which reduce heat gain, the City of Miami Beach will ensure that all new building is working to alleviate urban heat and reduce energy demand from cooling rather than add to the problem.*

Chapter 7: Government

Overview

The City is the level of government with the most immediate impact on most people's lives. As a City Boca Raton controls much of the infrastructure, sets rules and regulations on how and where things are built, provides vital services and opportunities for recreation and learning. Many of the actions listed already in this plan will be carried out at the city government level. Some of the actions will be carried out at the level of individuals or businesses. All the actions will impact, in some way, the residents, businesses, and visitors to our City.

In striving towards a more sustainable city and in deciding what should be done to reduce and adapt to climate change, the City should ask nothing from its residents and businesses that it isn't willing to do itself.

Ultimately, a City Sustainability Program should be ingrained in the way a City operates. Considering long-term sustainability into decision making should be imbedded in City processes. In using public funding, immediate monetary cost should be less important than the long-term impact the spending has on the city, the return on investment of a project, and the lifecycle costs of a good or a service. Decisions made in a City should not just benefit the present residents and businesses, but also the residents and businesses of our future.

Incorporating sustainability into City operations not only improves the sustainability of the City but is an opportunity to engage the City's more than 2,000 employees in sustainable practices and learning about and thinking about the environmental impact of behaviors. Those employees can spread that culture and understanding to their own homes, whether those homes are in Boca Raton or one of our neighboring municipalities and improve the overall sustainability of our region.

Projects and Programs Previously Completed by the City:

- The City signed the Mayor's Climate Action Pledge joining the Southeast Florida Regional Compact on Climate Change in 2017.
- In 2018 the City hired a Sustainability Manager and started an Office of Sustainability.
- In 2018 City Council passed a resolution encouraging the US Congress to take meaningful action to reduce GHG emissions.
- In 2019 the City Council created the Sustainability Advisory Board.

Goals and Targets

22. Increase investment in sustainability.
23. Increase staff awareness of sustainability.
24. Increase City leadership on sustainability issues.

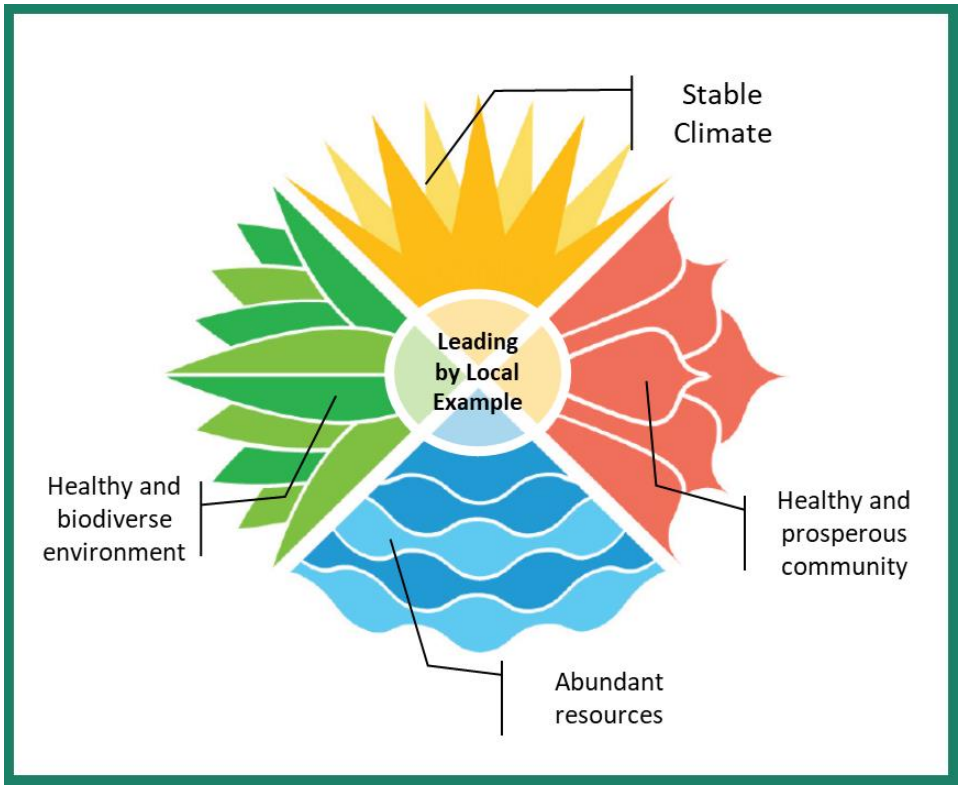
Actions from action plan completed or in progress by 2025 100%

Staff trained in sustainability 75%

Actions

Increase investment in sustainability.

Regularly monitor and update Sustainability Action Plan. This Sustainability Action Plan will be a living document. The initial draft is the framework that will be updated and improved as work in Sustainability is increased. Conduct an annual progress report to track progress on goals within the plan. Update the plan every five years to integrate new technologies and develop new goals based on progress.



Include sustainability in all City plan updates. Include the Sustainability Manager in master plan updates for assess the plans for inclusion of sustainability criteria.

Develop sustainability criteria for CIP investments. Develop sustainability criteria for CIP project considerations based on priorities identified in the Sustainability Action Plan.

Include a climate change element in future comprehensive plan updates. Add another element to the comprehensive plan to specifically address and set forth goals related to climate change.

Implement a green procurement policy. The City is a large consumer of goods and services locally. The purchasing preferences and practices of the City have the potential to drive market

change to better products, materials, and efficiency as well as spur growth in green industries. The policy may be phased in starting with p-card purchases and expanding to common RFP language and project criteria.

Certify the City as green. Choose a certification program for the City to obtain. The Florida Green Building Coalition maintains a rating system for local governments that recognized the unique laws, environment, and climate of Florida. In order to compare ourselves to our neighbors and track our progress relative to an established system, the City should consider applying for recognition from the FGBC's Green Local Government program. LEED for Cities is a combination of STAR communities and LEED for Neighborhood Development.

Increase staff awareness of sustainability.

Include sustainability presentation in new employee orientation. Give an overview of the strategies and goals, some scientific background that explains the necessity of the programs and suggest actions and behaviors that can help employees contribute to sustainable goals in their work and at home. Provide new employees with high quality water bottles, insulated lunch bags, reusable food containers, or other sustainable product that will help the new employees to incorporate the new behaviors.

Develop a City "green team." The team will consist of employees with an interest in sustainability and "green" actions. The meetings will include a short discussion on a topic of interest. The Green Team will create strategies to incorporate green behaviors and habits in their work, to engage their coworkers in understanding the reasons for such behaviors and create challenges and other initiatives to engage employees in sustainability.

Develop staff sustainability training. Take advantage of staff activities, meetings, and internal messaging to continue to provide information on the purpose and reasons for sustainable goals and action.

Create an employee recognition program. City staff are daily engaged in doing their jobs with as much quality as possible always with a mind on making the best use of resources. Many actions,

undertaken to save time or money or simply to be done in the best way, are sustainable without the initial goal of creating sustainability. The more that the City can point out what it is doing which is already sustainable, and the people making it happen, the more credit and momentum we get moving forward.

Increase City leadership on sustainability issues.

The tasks of creating a sustainable city is daunting but one does not need to go it alone. There are many organizations setting goals and providing guidance. The City is currently a part of several such groups including the National League of Cities and the Southeast Florida Regional Climate Change Compact. Leadership should continue to be active participants in both organizations. In addition, there are other pacts and groups that the City could explore in order to commit and find guidance towards their goals.

Commit to 100% clean energy. The Sierra Club's Ready for 100 campaign is a commitment by Cities to support transition to clean energy. Cities commit at differing levels, some setting targets for City operations and for community wide energy goals. The City could consider supporting the campaign and explore options for moving towards clean energy targets.

Explore and commit to global and national pledges. Examples include the Climate Mayors, the Global Covenant of Mayors for Climate and Energy, Compact of Mayors, and the National Wildlife Federation's Mayor's Monarch Pledge.

Lobby for state and federal action. Include sustainability topics in the City's annual legislative priorities. The lifting of certain state preemptions will better allow the City to determine what and how they would like to regulate. Federal regulations and incentives on renewable energy will also drive markets.

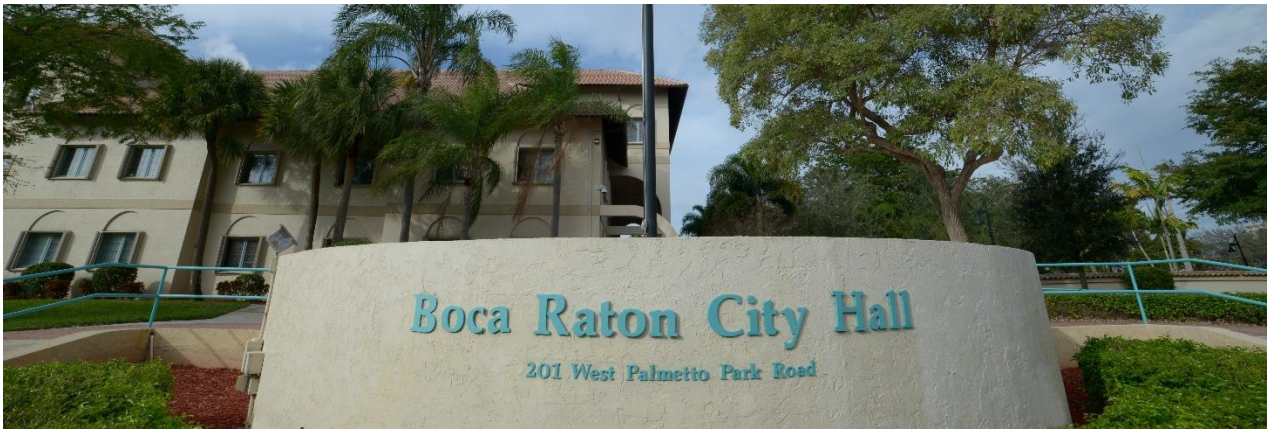
Regional Climate Action Plan 2.0

The Government Chapter incorporates the following recommendations from the RCAP2.0:

PP1: Support climate conscious government action.
AG-3: Promote local goods.

Case Studies:

City of Atlanta, Ready for 100: *The City of Atlanta City Council approved a measure to establish a goal to transition the community to 100% renewable energy. Staff created a plan which will guide the City to meeting the goal of 100% renewable energy for City operations by 2025 with 100% community wide by 2035. The plan and progress can be found at www.100atl.com.*



Chapter 8: Implementation

Synergies between departments

Sustainability is an overarching concept that is integrated throughout the organization. While all the actions listed here are under the umbrella of the Sustainability Action Plan, implementation will happen across departments and offices.

Implementation Priorities

The plan is comprehensive and many of the actions are long term in scope. Prioritization of initial actions will include a mix of some of the easier short-term actions as well as beginning to focus on some of the longer-term high impact actions. The following actions are proposed for initial prioritization.

Assessments and Data Collection

- **Complete a Greenhouse Gas Emissions Inventory.** This inventory will help to prioritize suggested actions towards meeting targets as well as give the City a baseline from which to measure progress.
- **Regional Climate Change Vulnerability Assessment.** While planning for future climate resiliency, the results of the assessment will help the City to prioritize actions with the largest impact and areas with the most vulnerability.

Community Outreach

- **Implementation Workshops**. Several of the goals have community input as an action in order to develop community buy in and understand community needs and priorities to move forward with actions within the plan. Implementation workshops will be set up to target specific audiences such as residents, business owners, development community, and community groups within the City.
- **Green Living Workshops**. Through the public input process, the City learned of interest the community has in opportunities to hear and learn more about strategies to incorporate sustainability into their lives, homes, and businesses and learn about topics such as composting, electric vehicles, and solar electricity.
- **Green Living Certifications**. Using the Coastal Connection brand, develop a sustainable home and a sustainable landscape program.

Programs

- **Recycling Improvements**. Through the public input process the community expressed interest and concern with improving information regarding recycling. Focusing on contamination reduction through the "Recycle Right" campaign as well as educating on implementation of recycling programs where none exist now may be impactful.
- **Energy Efficiency**. One high impact but low-cost effort is to promote no and low-cost ways to increase energy efficiency in the home. Targeting neighborhoods and community organizations and building the campaign around input received through the implementation workshop process will help to promote success.
- **Wildlife Gardens and Trees**. Native plants and trees also received significant support throughout the public input process. Promoting native and wildlife beneficial plants as well as supporting canopy trees for residents.

City Operations

- **Purchasing Policy**. Begin working on policies to increase the sustainability of the City's procurement process and support the use of sustainable products and services.
- **Fleet Policy.** Begin developing policies that will reduce the impact of the City's fleet.
- **Solar Energy Assessment.** Study the opportunities for Solar on existing City facilities.

Policies and Regulation.

- **Green Building Policy.** Bring a resolution to Council regarding building City facilities to Green standards. Begin drafting policies and ordinances which will enhance green building in the City.
- **Pervious requirements.** Develop policy language which will protect residential neighborhood from stormwater flooding through pervious and drainage requirements.

Progress Reports and Updates

The SAP is intended to be an adaptive document. Annually, a report will communicate progress towards adopted goals as well as updates related to any changes which may occur in terms of priorities or actions to be taken. At the end of the plan term, 2025, the SAP will be revised in detail and once again brought to City Council for approval.

Comprehensive Plan Update

The City's Comprehensive Plan in in the process of being updates. Within the proposed update there are policies and objectives which align with the Sustainability Action Plan. Such policies relate to housing density, mobility, complete streets, native dune vegetation, greenhouse gas emission reduction, the adoption of solar energy, incorporating impacts of climate change and sea level rise in to planning and infrastructure, collaborating with the Compact and neighboring municipalities on resiliency, as well as several other aligning objectives and policies. Once the Comprehensive Plan amendments are formally adopted, a supplemental document to this SAP will highlight those alignments and the way in which this SAP meets the Comprehensive Plan's objectives.