



Hallandale Beach  
PROGRESS. INNOVATION. OPPORTUNITY.

## Sustainability Action Plan

## Acknowledgments

Message from Roger M. Carlton, City Manager

## Summary

## Background

Solutions  
Engagement  
Results

## Vision

## Goals

Short-Term Goals  
Long-Term Goals

## Action

Resource Conservation & Efficiency  
Materials Minimization & Recycling  
Land Use & Transportation  
Natural Resources & Resilience  
Education & Outreach  
Funding & Evaluation

## Implementation

Management  
Funding  
Scheduling  
Policy

## Appendix

Baseline  
Benchmarking  
Community  
Projects  
Budgets

3

4

5-7

8

10

11

11

12

13

14

15

18

33

39

44

50

55

61

62

66

68

69

73

74

86

89

90

117





## Hallandale Beach City Commission

Keith London, Mayor

Michele Lazarow, Vice Mayor

Michael Butler, Commissioner

Richard Dally, Commissioner

Anabelle Lima-Taub, Commissioner

## City Manager

Roger M. Carlton

## City of Hallandale Beach Green Initiatives Coordinator/ Sustainability Action Plan Project Manager

Sue Fassler

## CITY OF HALLANDALE BEACH INTERDEPARTMENTAL PROJECT TEAM

### Resource Conservation & Efficiency

Tom Camaj, Contracts Coordinator

Donna Carlson, Detective

Gregg Harris, Capital Projects Manager

Alex Vera, Police Officer/SWAT/Training

### Materials Minimization & Recycling

Gary Gibson, Operations Manager

Jane Graham, Assistant City Attorney

Sonia Quinones, Police Chief

Carolyn Smith, Procurement Specialist

### Land Use & Transportation

Stephanie Delgado, Special Projects Coordinator

Eric Houston, Transportation & Transit Planner

Yamil Lobo, Fleet Administrator

Beverly Sanders-Mayweather, Director of Human Services

### Natural Resources & Resiliency

Mark Ellis, Fire Chief

Mary Francis Jeannot, Assistant Director of Public Works/Administration

Mariana Pitiriciu, Assistant Director of Public Works/City Engineer

## Acknowledgements

### Natural Resources & Resiliency

Bret Warren, Public Service Worker II

Steve Wold, Operations Manager/Utilities

### Education & Outreach

Charity Latt, Administrative Assistant

Denton Lewis, Application Support Analyst

Kristin Ramirez, Special Events Coordinator

Sherlie Sininger, Bluesten Park Recreation Supervisor

### Funding & Evaluation

Nydia Rafols, Deputy City Manager

Noemy Sandoval, Senior Accountant

Chris Swain, Chief Electrical Inspector

### City of Hallandale Sustainability Action Plan Team Support Staff

Greg Chavarria, Assistant City Manager/Chief Information Officer

Harry Crooks, Water Plant Operator

Lina Duran, Business Development Coordinator

Jeremy Earle, Assistant City Manager

Manga Ebbe, Project Manager

Keven Klopp, Director of Development Services

Eustacio LaRosa, Public Works Superintendent

Steven Parkinson, Assistant City Manager/Director of Public Works

Meghan Peteler, Administrative Assistant

Jesus Rodriguez, Fleet Service Superintendent

James Sylvain, Assistant Director, Public Works/Utilities

# Message from Roger M. Carlton

## CITY MANAGER

Over 90 years ago, Luther Halland founded what is now Hallandale Beach. Our City has evolved from a small farming community to one of the fastest growing cities in Florida. In recent years, the City has sought balanced growth and preservation of what makes our community an attractive destination – our beaches, waterways and parks; public infrastructure; a thriving business sector; and most of all the friendly, diverse and forward-looking character of our citizens.

A commitment to our prosperity, our people and our place means we must carry the City's legacy forward to the future. This Sustainability Action Plan is just the beginning of this process. We know our region faces challenges posed by a growing population, limited resources, accelerating technologies and a changing climate. Beginning with this plan, we will strive to lead by example, ensuring City operations are low-impact, efficient and responsive. We will also work to improve our community by implementing policies that protect the environment, use resources responsibly, support vulnerable members of our community and proactively adapt to our changing world.

In the process of developing this Sustainability Action Plan, many staff members of diverse backgrounds and areas of expertise evaluated practices and developed projects to improve performance, which will lead to an estimated \$2.2 million in tax dollars saved over the next ten years. If adopted, the City will reduce water use by 20% through efficient fixtures and reusing water for irrigation. Energy conservation measures that will cut the city's utility bills by about \$200,000 per year have been identified. The City's network of bike and pedestrian paths will be expanded, enhancing the health and safety of our citizens. In the area of materials minimization, staff is developing a program to divert 30% of the City's waste through recycling by 2022. This program could save \$1 million over ten years by increasing recycling and reducing disposal fees.

The vision of sustainability included in this Sustainability Action Plan will help make Hallandale Beach the vibrant, innovative and resilient community it should be – now and for future generations. With direction from the City Commission, staff is committed to working on the actions that have been identified. The City will continue to work with the Southeast Regional Florida Climate Compact, Broward County, our peer local governments and the citizens of Hallandale Beach as we accomplish the sustainability goals. The City believes the value of its Sustainability Action Plan is beyond question. We invite robust community participation throughout its implementation.

The foresight of the City Commission for authorizing the Sustainability Action Plan and the diligence of the City team, led by Sue Fassler, is extraordinary. RS&H, Inc. deserves accolades for the incredible amount of leadership and effort that they put forth throughout the development of this Plan. Focus on sustainable operations will make a difference in the prosperity of our businesses, the well-being of our people and the environmental integrity of this beautiful place we call Hallandale Beach. As the City grows and adapts with the times, sustainability will prepare the entire Community to seize opportunities ahead. The residents and business people of Hallandale Beach look forward to continued progress and prosperity in the years to come.

Sincerely,

Roger M. Carlton, City Manager

## Message



“A commitment to our prosperity, our people and our place means we must carry the City's legacy forward to the future.”

Roger M. Carlton



# Summary

The Sustainability Action Plan (SAP) aims to improve the quality of life for all in the community while protecting the environment, assuring continued prosperity and developing the resilience needed to face future challenges. The SAP leads by example through operating a low-impact, efficient and responsive City government. It is important to realize that sustainability is not achieved through a one-time effort. Thus, the City views this plan as a living document, which establishes a system that will be managed over time to continually improve and evaluate the City's performance.

To develop this plan, the Project Management Team measured the City's existing performance, built the capacity of staff to make a difference and identified opportunities for environmental and social benefits that yield measurable financial returns, known as return on investment (ROI). These benefits can be reinvested in future expanded efforts to sustain our City.

In developing this strategy the City has been guided by a commitment to: reduce energy; fuel and water use; minimize what the community throws away; enhance places and transportation choices; safeguard natural resources; inform and expand commitment to the SAP from employees and citizens; and obtain the funding necessary for success.

These commitments are formalized within six focus areas:



Summary

# Summary

The SAP establishes 14 short-term (five-year) goals within each focus area to ensure accountability for results:

## Summary

TABLE 3: HALLANDALE BEACH SHORT-TERM SUSTAINABILITY GOALS

BY 2022	<b>RESOURCE CONSERVATION &amp; EFFICIENCY</b>  <ul style="list-style-type: none"> <li>Reduce electricity consumption of City operations by 15%</li> <li>Reduce potable water consumption of City operations by 20%</li> <li>Displace 10% of gasoline / diesel fuels with fuel efficiency or alternative fuels</li> </ul>	<b>MATERIALS MINIMIZATION &amp; RECYCLING</b>  <ul style="list-style-type: none"> <li>Achieve a 30% diversion rate from recycling and composting</li> <li>Reduce total waste from City operations by 5% through source reduction</li> </ul>	<b>LAND USE &amp; TRANSPORTATION</b>  <ul style="list-style-type: none"> <li>Establish targeted green building standards for new public, commercial and multifamily buildings and infrastructure</li> <li>Increase existing percentage of the bicycle/ pedestrian network that attains Level of Service B or better by 10% annually</li> </ul>
	<b>NATURAL RESOURCES &amp; RESILIENCY</b>  <ul style="list-style-type: none"> <li>Complete a vulnerability assessment and adaptation action plan</li> <li>Improve the City's Community Rating System classification to 5</li> <li>Complete a dune management plan</li> </ul>	<b>EDUCATION &amp; OUTREACH</b>  <ul style="list-style-type: none"> <li>Train and achieve commitment from 100% of employees to understand and contribute to sustainability initiatives</li> <li>Develop a sustainability communications plan</li> </ul>	<b>FUNDING &amp; EVALUATION</b>  <ul style="list-style-type: none"> <li>Fund sustainability action plan projects with 50% internal funds, 50% external funds (grants and developer contributions)</li> <li>Measure and monitor 50% of 19 sustainability key performance indicators</li> </ul>

## Summary

The Project Management Team has developed the projects identified in this SAP as the first necessary step toward achieving the stated goals. The outcomes will produce significant environmental benefits for the City. The outcomes are based on a commitment to improving the quality of life for the City's residents, establishing a sustainable platform for businesses and generating positive net returns on investment for the City and its stakeholders. The first set of sustainability projects are projected to generate close to \$7 million in revenue or avoided costs and \$2.2 in net benefits over ten years – after accounting for all estimated necessary investments.

## Summary

\$2.2 Million

Net Benefit:

LED Streetlights / LED Interior Lighting / Solar Thermal Systems / Existing City Building Commissioning / Electric Vehicles & Infrastructure / Increase Fuel Economy / Indoor Water Fixtures and Fittings Efficiency / HVAC controls / Right Size Fleet / Expand Reuse Water Projects / Expanded Service Hours Work Week / Irrigation Efficiency / Increase Community-wide Recycling / Green Purchasing Program / Composting Feasibility Assessment / Bikeshare / Build out Bicycle and Pedestrian Infrastructure / Develop a Vulnerability / Adaptation Assessment / Dune Protection Plan / Low Impact Development Standards / Integrate Sustainability into Employee Training & Increase Employee Participation / Communications Plan / Develop Green Event Policies / Utility Management System / Revolving Fund / Complete a Greenhouse Gas Inventory & Set Reduction Targets / STAR Communities Certification

Sustainability is good business and crucial for the future. In a report to investors in 2017, Moody's Investors Service, Inc. stated that it would begin incorporating climate change into its credit ratings for state and local bonds. Cities that choose not to deal with risks associated with sea level rise and climate change in general may see higher interest rates in the future. As the City implements this SAP, it will continually improve processes and monitor performance to be ready for new risks and opportunities. Within five years, the City anticipates that these sustainable actions will enhance the vibrancy, inclusiveness

and the natural and cultivated beauty of the community. It is critical that the City prepares for the future in an economical and equitable manner that uses valid data upon which to make investments from limited resources.



Sustainability is a journey – not a destination. This plan is a roadmap that will be updated over time. The City will continue identifying opportunities to achieve its short and long goals in each of its focus areas. Some initial directions for future projects include:

Project Name	Focus Area
Motor Efficiency Upgrades	Resource Conservation & Efficiency: Energy
Athletic Field Lighting Efficiency and Control	Resource Conservation & Efficiency: Energy
Efficient Glazing	Resource Conservation & Efficiency: Energy
Solar Pool Heating	Resource Conservation & Efficiency: Energy
Solar Photovoltaics	Resource Conservation & Efficiency: Energy
Greywater Reuse	Resource Conservation & Efficiency: Energy
HVAC Condensate Harvesting	Resource Conservation & Efficiency: Water
Cooling Tower Efficiency	Resource Conservation & Efficiency: Water
Process Water Efficiency	Resource Conservation & Efficiency: Water
Propane Vehicles	Resource Conservation & Efficiency: Water
Biofuels	Resource Conservation & Efficiency: Fleet
Anti-Idling	Resource Conservation & Efficiency: Fleet
Vehicle Miles Traveled Reduction	Resource Conservation & Efficiency: Fleet
Alternative Fuels Infrastructure Feasibility Assessment	Resource Conservation & Efficiency: Fleet
Regulate Use of Styrofoam and Single-use Plastic Bags	Resource Conservation & Efficiency: Fleet
Perform a Waste Characterization Study	Materials Minimization & Recycling
Green Building and Operations Standards	Materials Minimization & Recycling
Eco-District	Land Use and Transportation
Form-based Code Expansion	Land Use and Transportation
Enhance Community Bus Service	Land Use and Transportation
Improve CRS Classification	Land Use and Transportation
Mangrove Restoration	Natural Resources & Resiliency
Implement Adaptation Actions	Natural Resources & Resiliency
Institutionalize Sustainability Management among Staff and Citizens	Natural Resources & Resiliency
Sustainability Branding	Education & Outreach
Greenhouse Gas Mitigation Education and Outreach Campaign	Education & Outreach
Set GHG Emissions Reduction Targets	Education & Outreach
Non-market Valuation of SAP Projects	Funding & Evaluation
Sustainability Fees	Funding & Evaluation

## Summary



# Background

Acceptance of this report will commit Hallendale Beach to embarking on a journey towards sustainability to enhance environmental quality, enrich the economy and strengthen the well-being of citizens and stakeholders.

As with any journey, there is a time for planning, a time for experiencing and a time for reflecting. This is similar to the “Plan, Do, Check, and Act” cycle, a proven tool used in business and government to systematically move an organization towards its long-term goals. Achieving ambitious goals requires an awareness of the conditions that exist now, defining a desired future, setting a path to get there and executing the plan.

In 2017, the City selected the firm RS&H, Inc. to guide it through the initial steps of the sustainability journey and help craft a strategic approach for the next several years. RS&H, Inc. is a Florida-based, multi-discipline facilities and infrastructure consulting firm that has completed over 50 sustainability projects in the state with a focus on both technical and adaptive solutions. During the planning stage, the team identified those elements of the City’s day-to-day operations where the triple bottom line (i.e. people, planet and profit) was pivotal to success.

In each focus area, a primary emphasis was placed on defining the business case for sustainability. The team identified projects that would move the City toward a more sustainable future and also create a positive economic return over time through improving efficiency, decreasing waste and minimizing risks. The approach also considered the quality of life of community members, care for the natural environment and equity for all socioeconomic groups.

The SAP includes six focus areas shown in Table 1:

TABLE 1: SAP FOCUS AREAS

 RESOURCE CONSERVATION & EFFICIENCY	 MATERIALS MINIMIZATION & RECYCLING	 LAND USE & TRANSPORTATION
 NATURAL RESOURCES & RESILIENCY	 EDUCATION & OUTREACH	 FUNDING & EVALUATION

Background

Hallandale Beach intends to lead by example through operating an efficient and responsive city government which mitigates negative environmental impacts by enhancing beneficial policies and projects in Hallandale Beach. The City understands that sustainability is not achieved through a one-time effort; therefore, this plan establishes a process that will be managed over time to continually improve the City's performance. The process provides a framework for interaction across the City's complex systems that seeks to break down departmental silos and lead to coordination between City staff, elected officials and all external stakeholders.

The approach used to develop this SAP measures the City's sustainability performance, builds capacity among staff and yields environmental and social benefits that generate economic returns. These returns can then be reinvested into future efforts that remediate past practices and enhance resiliency.

Potential solutions to the City's sustainability challenges were identified through assessments of current conditions (baseline assessment) and comparison with peers (benchmarking). Next, 25 representatives from across City operations worked together to establish goals and develop a portfolio of impactful projects. Moving forward, the City will implement the projects included in the following pages and evaluate the SAP's progress.

The Sustainability Action Plan is not designed to sit on a shelf. It is a living document of a journey that takes what the City learns and applies it to moving forward in a better way. As the City Commission translates the SAP to policy, all stakeholders are welcome to join in the effort and help to ensure that the goals are met.

## Background

## Establish < Goals





## SOLUTIONS

The first step in the SAP process was to establish a baseline for government operations by thoroughly evaluating performance in the City's six chosen focus areas. Analysis of the City's diverse operational data resulted in a comprehensive picture of the City's current operations, resource expenditures and environmental impacts. This baseline revealed opportunities for improvement and will serve as a reference for measuring progress in the future. Furthermore, more than 15 interviews with City staff generated ideas and potential solutions. Comparing Hallandale Beach's performance to three peer cities further identified strategies and projects with the potential to improve performance.

The tool the Project Team used was the STAR Community Rating System. Established by local governments for Sustainability USA, the U.S. Green Building Council and the National League of Cities, STAR is a voluntary, self-reporting framework for evaluating, quantifying, and improving the livability and sustainability of U.S. communities. Used as an evaluation tool, STAR facilitates meaningful comparisons of cities' sustainability performance. Cities that formally submit for certification are eligible to receive a designation as a 3-STAR, 4-STAR or 5-STAR community. Nationwide, there are thirty-two 3-STAR communities, twenty-five 4-STAR communities and four 5-STAR communities.

The project team informally used STAR to benchmark Hallandale Beach's sustainability progress to three similar communities, and performed a feasibility assessment to determine if the City is ready to pursue STAR certification. These cities were chosen due to their geographic and demographic similarities to Hallandale Beach:

- 1 Pinecrest, Florida
- 2 Park Forest, Illinois
- 3 Broward County, Florida

As part of this STAR benchmarking process, the Project Management Team evaluated the City based upon 526 STAR indicators within the realms of:

Climate & Energy  
Built Environment  
Economy & Jobs  
Education, Arts & Community  
Equity & Empowerment  
Health & Safety  
Natural Systems

Background



Each of the 526 STAR indicators are tied to a specific point value. Cities that receive a STAR score between 200-399 points are eligible for a 3-STAR ranking. Cities that receive between 400-559 points are eligible for a 4-STAR rating and communities that score above 600 points are eligible for a 5-STAR rating.

*For a more detailed breakdown of the STAR process please visit [starcommunities.org](http://starcommunities.org).*

The results show that Hallandale Beach is comparable to its regional peers who are committed to sustainability, with the potential to earn a 3-STAR rating. The City out paces its peers in some areas of the assessment (Education, Arts & Community and Equity & Empowerment) and has room to improve in others. There is a limit to how well the City is able to score in natural systems, as the City is largely urbanized.

The lessons learned from establishing this sustainability baseline and the process of benchmarking the City against its peers have been incorporated throughout this plan. See the Appendix for greater detail on this baseline and benchmarking effort.

## ENGAGEMENT

A plan without proactive people is an empty promise. As part of the SAP process, the Project Management Team worked with 25 representatives from every City department to establish a sustainability vision, set goals and develop a portfolio of cost-effective sustainability projects. Through collaborative meetings and workshops, staff became familiar with the City's baseline performance and the achievements of peer cities. They were trained to imagine a desired level of future performance, then determine the incremental steps necessary to achieve it. Fourteen realistic goals for the six focus areas were established. This process helped focus staff on developing projects designed to achieve these goals. For each project, staff helped calculate expected reductions in resource use and also estimated the contribution of each project to the Plan's stated goals. Project funding requirements were also calculated. Benefits, such as avoided costs or new revenues, ROI and Net Present Value (NPV), were projected in order to support the City's decision makers in prioritizing limited resources. Project managers and schedules have been identified to ensure accountability throughout the project life.

The SAP Project Management Team also facilitated two community workshops designed to engage citizens and obtain their input for the SAP. Approximately two dozen community members attended these workshops. Participants were briefed on the City's baseline and benchmarks as well as the City's preliminary sustainability vision,

project portfolio and goals. Attendees voted on actions they would like the City to take, drawn from the City's preliminary STAR assessment. The attendees provided valuable input that has been incorporated into the plan.

The results from these workshops can be found in the Appendix.

## RESULTS

This SAP contains a portfolio of sustainability projects that will generate a net return of nearly \$2.2 million, while expanding public services and enhancing environmental stewardship. These returns will come from reducing energy, water and fuel use and improving recycling. The portfolio also includes projects designed to: engage employees; conduct outreach to residents, improve mobility; quantify and mitigate greenhouse gas (GHG) emissions; identify vulnerabilities to climate change; improve resilience; and finance and evaluate sustainability projects.

Some of the notable project examples (with 10-year projected net present value in parentheses) include:

- Increasing the City's recycling rate (\$1 million)
- Transitioning some City departments to an expanded service hour work week model (\$765,000)
- Right-sizing the fleet (\$447,000)
- Expanding reuse water irrigation (\$148,000)
- Improving HVAC control systems (\$174,000)

While not all projects have a positive ROI in economic terms, all have significant benefits to the community. The project portfolio is designed so that projects with high financial returns help fund those that are advantageous for other reasons. Simply stated, not all sustainability and resiliency projects should be required to individually pass a purely economic test. This study includes a package of programs – all of them are important.

The next step is to implement these projects through the City's legislative and administrative processes. The City plans to use social media, meetings and other means to communicate the benefits of the SAP and achieve community support. The City will measure its performance and report results. Lessons learned will be incorporated into periodic updates of the City's operational performance. Goals will be revisited and new projects will be added to the portfolio in order to meet evolving expectations, take advantage of new technologies and foster partnerships. The City plans to reinvest in these new opportunities, as financial returns are realized, and will also leverage external sources of funding.

## Background





# Vision

Vision is the embodiment of what an organization aspires to be and is a catalyst for successfully moving in the direction of stated goals. Thus, it is a fundamental aspect of sustainability in Hallandale Beach and serves to clearly communicate and guide the City’s direction. The Vision establishes the guidelines for the sustainability and resiliency programs, and helps keep the City on the approved course.

The City will be guided by a vision of sustainability that expresses the importance of sustainability to residents, businesses and visitors. The sustainability vision statement was developed over several months with multiple rounds of input from 25 City staff members. A key to this vision statement includes the idea that the City must serve as an example of excellence in each of the six SAP focus areas and that the boundaries of decision making be expanded beyond just the short term to include guidance for those that will inhabit the City in the future.

TABLE 2: CITY OF HALLANDALE BEACH SUSTAINABILITY VISION

**The City of Hallandale Beach will lead in raising awareness, reducing waste and pollution and implementing clean technology and infrastructure – while generating measurable, cost effective and enduring economic, social and environmental benefits – to improve the quality of life in our resilient coastal community now and into the future.**

The Vision establishes the guidelines for the sustainability and resiliency programs and helps keep the City on the approved course.



# Goals

The City's systematic approach to sustainability is supported by a commitment to protect and enhance the environment, improve community quality of life and generate positive returns on investment.

To realize this vision of sustainability excellence, the SAP recommends 28 short-term and long-term goals in each of the plan's six focus areas.

## SHORT-TERM GOALS

Short-term goals are meant to be accomplished within a five-year span through implementing the projects detailed in this plan. As the City

implements its sustainability program, it will monitor performance relative to these goals. The year 2016 will be the baseline year for measuring progress. The City will strive to continually improve its performance while remaining vigilant for new risks and opportunities.

The 14 short-term goals, organized by focus area, are shown below (Table 3).

# Goals

TABLE 3: HALLANDALE BEACH SHORT-TERM SUSTAINABILITY GOALS

BY 2022	<b>RESOURCE CONSERVATION &amp; EFFICIENCY</b>  Reduce electricity consumption of City operations by 15% Reduce potable water consumption of City operations by 20% Displace 10% of gasoline / diesel fuels with fuel efficiency or alternative fuels	<b>MATERIALS MINIMIZATION &amp; RECYCLING</b>  Achieve a 30% diversion rate from recycling and composting Reduce total waste from City operations by 5% through source reduction	<b>LAND USE &amp; TRANSPORTATION</b>  Establish targeted green building standards for new public, commercial and multifamily buildings and infrastructure Increase existing percentage of the bicycle/ pedestrian network that attains Level of Service B or better by 10% annually
	<b>NATURAL RESOURCES &amp; RESILIENCY</b>  Complete a vulnerability assessment and adaptation action plan Improve the City's Community Rating System classification to 5 Complete a dune management plan	<b>EDUCATION &amp; OUTREACH</b>  Train and achieve commitment from 100% of employees to understand and contribute to sustainability initiatives Develop a sustainability communications plan	<b>FUNDING &amp; EVALUATION</b>  Fund sustainability action plan projects with 50% internal funds, 50% external funds (grants and developer contributions) Measure and monitor 50% of 19 sustainability key performance indicators

# Goals

## LONG-TERM GOALS

Long-term goals reflect the City's aspiration to build a resilient coastal community by the year 2040. This SAP is the first step towards defining what a resilient coastal community can be. Looking deeper into the future, this SAP is freed from the finite details of the present and enabled to imagine new, better ways of living and working together. Likewise, these long-term goals go beyond the foundation built by accomplishing short-term goals. These goals are aspirational and can be expected to

change as the future unfolds. For this reason, the SAP is intended to function as a living document, capable of growing to encompass the promise of these long term goals, while managing the inevitable outcomes of climate change.

The 14 long-term goals, organized by focus area, are shown below (Table 4).

## Goals

TABLE 4: HALLANDALE BEACH LONG-TERM SUSTAINABILITY GOALS

BY 2040	<b>RESOURCE CONSERVATION &amp; EFFICIENCY</b>  <p>Reduce electricity consumption for City operations, commercial and residential sectors by 40%</p> <p>Reduce potable water consumption for City operations, residential and commercial Sectors by 40%</p> <p>Displace 90% of gasoline/diesel fuels with fuel efficiency or alternative fuels</p>	<b>MATERIALS MINIMIZATION &amp; RECYCLING</b>  <p>Achieve a 75% diversion rate from recycling (45%) and composting (30%)</p> <p>Reduce total waste from City operations by 20% through source reduction</p>	<b>LAND USE &amp; TRANSPORTATION</b>  <p>Establish standards for existing public, commercial and multifamily buildings and infrastructure; all eligible structures will meet the City's standards</p> <p>Achieve a balanced transportation system with no single mode having more than 30% of total trips</p>
	<b>NATURAL RESOURCES &amp; RESILIENCY</b>  <p>Implement the vulnerability assessment and adaptation action plan</p> <p>Improve the City's Community Rating System classification from a 5 to a 4</p> <p>Restore dunes along all beaches</p>	<b>EDUCATION &amp; OUTREACH</b>  <p>Require all employees to contribute to a sustainability project</p> <p>Involve 80% of full-time residents in the City's sustainability initiatives, resulting in national recognition</p>	<b>FUNDING &amp; EVALUATION</b>  <p>Fund Sustainability Action Plan projects with 20% internal funds, 80% external funds, including revolving funds</p> <p>Measure and monitor 100% of 19 key performance indicators</p>



## Action

## Action

To achieve the productivity and quality of life benefits associated with sustainability, each of the City's departments has participated in a top-to-bottom review of its operations to identify opportunities for continuous improvement. In developing this strategy, the SAP team has been guided by a commitment to reduce consumption, minimize waste, cultivate community and ensure the availability of resources for the benefit of future generations.

The goals and projects identified in this plan will yield significant environmental benefits for the City. The projects are based in a commitment to improve the quality of life for our residents and to collectively generate a positive net return on investment for the City and its stakeholders.

To fulfill the City's commitment, the team has developed a portfolio of 27 projects across six focus areas. Together, the projects have the potential to generate nearly \$2.2 million in net benefits to the City, while extending new services to citizens and protecting the environment.

This is just the beginning. To achieve its long term goals, this plan must grow and evolve. The SAP Project Management Team has identified a

significant number of the future actions the City should take to build a resilient coastal community for future generations. More importantly, City employees and citizens will be empowered with a strategic sustainability planning process and action program that will allow them to continue to develop green initiatives and to improve the community going forward.

Implementation of projects will begin in FY19 with the aim of accomplishing the City's five-year goals. Since most projects include benefits that stretch beyond five years, their benefits to the City have been calculated over a 10-year time frame. As this plan evolves, new projects will be identified and implemented, moving the City closer to achieving its long-term goals.

Table 5, on the following page, outlines the projects the SAP team has developed and includes projected net economic benefits over 10 years. Net benefit is the result of subtracting required investment from expected benefits. The investment needed is also shown. Most projects show a positive net benefit, meaning that project benefits exceed project costs. While some projects show a negative net benefit, as a whole, the portfolio of projects is estimated to generate a return on investment of 52%, paying for itself in six years.





TABLE 5: HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT PORTFOLIO

Project Name	Net Benefit
LED Streetlights	\$78,000
LED Interior Lighting	\$24,000
Solar Thermal Systems	-\$21,000
Existing City Building Commissioning	\$124,000
Electric Vehicles & Infrastructure	\$90,000
Increase Fuel Economy	\$118,000
Indoor Water Fixtures & Fittings Efficiency	\$19,000
HVAC controls	\$174,000
Right Size Fleet	\$447,000
Expand Reuse Water Projects	\$148,000
Expanded Service Hours Work Week	\$765,000
Irrigation Efficiency	-\$7,000
Increase Community-wide Recycling	\$1,066,000
Green Purchasing Program	\$12,000
Composting Feasibility Assessment	-\$48,000
Bikeshare	\$0
Build-out Bicycle & Pedestrian Infrastructure	-\$660,000
Develop a Vulnerability/Adaptation Assessment	-\$82,000
Dune Protection Plan	\$0
Low Impact Development Standards	\$0
Integrate Sustainability into Employee Training	\$2,000
Communications Plan	\$0
Develop Green Event Policies	\$0
Utility Management System	\$19,000
Revolving Fund	\$0
Complete a Greenhouse Gas Inventory & Set Reduction Targets	-\$24,000
STAR Communities Certification	-\$13,000
<b>TOTAL</b>	<b>\$2,231,000</b>

Net benefit is the benefit remaining after all costs have been recouped. The Project Team anticipates that these projects will accomplish the majority of the SAP's five-year goals (Figure 1). As next steps are taken, goals will be fully attained.<sup>1</sup>

<sup>1</sup> The contribution of projects to the SAP's Source Reduction, Development, Transportation, Flood Hazard and Funding goals cannot be calculated at present. As projects and project ideas are developed further their contributions will be calculated.

Action



Sustainability is a journey – not a destination. This plan is a roadmap that will be updated over time. The City will continue identifying opportunities to achieve its short and long goals in each of its focus areas. Some initial directions for future projects include:

Project Name	Focus Area
Motor Efficiency Upgrades	Resource Conservation & Efficiency: Energy
Athletic Field Lighting Efficiency and Control	Resource Conservation & Efficiency: Energy
Efficient Glazing	Resource Conservation & Efficiency: Energy
Solar Pool Heating	Resource Conservation & Efficiency: Energy
Solar Photovoltaics	Resource Conservation & Efficiency: Energy
Greywater Reuse	Resource Conservation & Efficiency: Energy
HVAC Condensate Harvesting	Resource Conservation & Efficiency: Water
Cooling Tower Efficiency	Resource Conservation & Efficiency: Water
Process Water Efficiency	Resource Conservation & Efficiency: Water
Propane Vehicles	Resource Conservation & Efficiency: Water
Biofuels	Resource Conservation & Efficiency: Fleet
Anti-Idling	Resource Conservation & Efficiency: Fleet
Vehicle Miles Traveled Reduction	Resource Conservation & Efficiency: Fleet
Alternative Fuels Infrastructure Feasibility Assessment	Resource Conservation & Efficiency: Fleet
Regulate Use of Styrofoam and Single-use Plastic Bags	Resource Conservation & Efficiency: Fleet
Perform a Waste Characterization Study	Materials Minimization & Recycling
Green Building and Operations Standards	Materials Minimization & Recycling
Eco-District	Land Use and Transportation
Form-based Code Expansion	Land Use and Transportation
Enhance Community Bus Service	Land Use and Transportation
Improve CRS Classification	Land Use and Transportation
Mangrove Restoration	Natural Resources & Resiliency
Implement Adaptation Actions	Natural Resources & Resiliency
Institutionalize Sustainability Management among Staff and Citizens	Natural Resources & Resiliency
Sustainability Branding	Education & Outreach
Greenhouse Gas Mitigation Education and Outreach Campaign	Education & Outreach
Set GHG Emissions Reduction Targets	Education & Outreach
Non-market Valuation of SAP Projects	Funding & Evaluation
Sustainability Fees	Funding & Evaluation



## Action

The following sections of this plan explain the importance of each focus area to the community and provides a brief snapshot of the City's performance to date and its future goals.

Next, the Plan defines the projects that will be implemented over the next 10 years to achieve the City's goals.

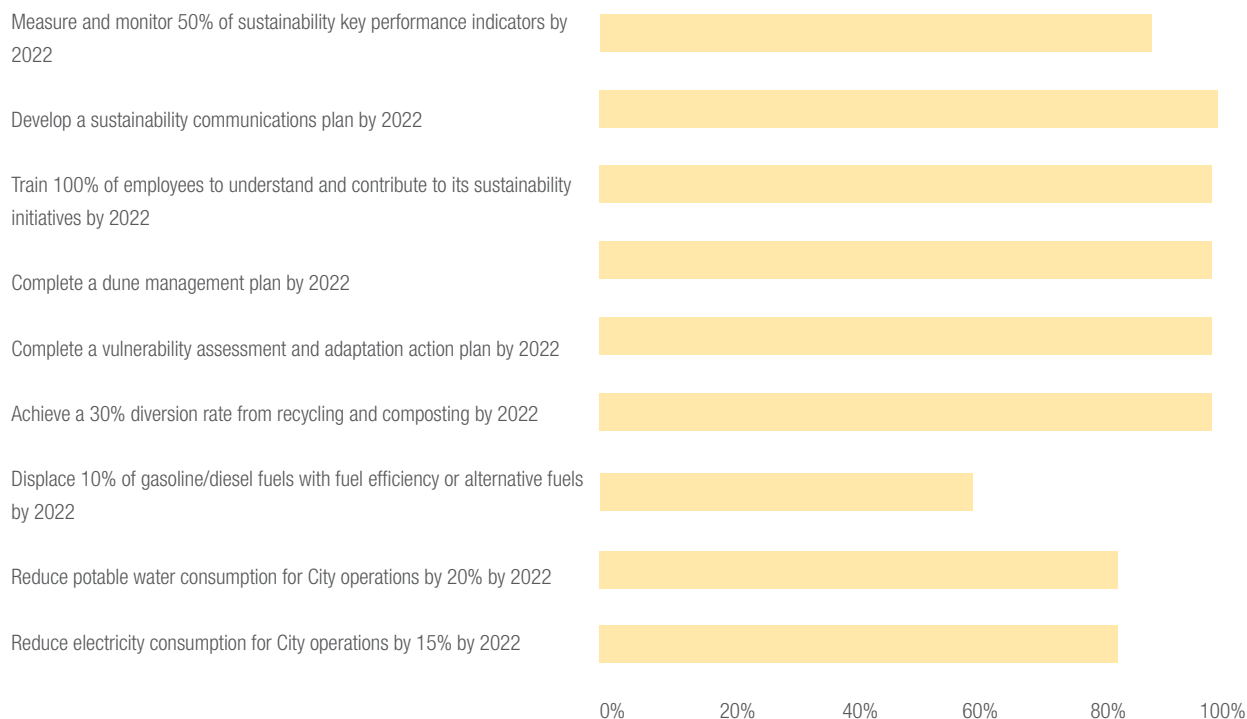
The NPV and ROI have been estimated for each project. Both NPV and ROI are ways of comparing the financial benefits of projects. NPV compares the difference between the costs and the benefits of a project over time. The greater the positive difference, the greater the financial benefit to the community. In addition, NPV favors projects that benefit the City sooner rather than later. ROI measures the ratio of project's benefits to its cost expressed as a percentage – the higher the ROI, the better.

In addition to these financial metrics, this Plan estimates how much each project will contribute to the City's specific goal, where feasible. This is expressed as a percentage of each goal. Again, the closer to 100% goal attainment the better. Figure 1 illustrates quantifiable contributions of planned projects to nine of 14 goals. Contributions of projects to the remaining goals will be quantified as further data becomes available.

The lead department and project manager that will be responsible for implementing the project is identified.

Each focus area section also indicates next steps the City could take to extend the plan into the future by adding new projects and continually improving performance.

FIGURE 1: PROJECT CONTRIBUTION TO FOCUS AREA GOALS







## Action

### LED STREETLIGHTS

- NPV: \$78,000
- ROI: 58%
- Contribution to Goal: 12%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### LED INTERIOR LIGHTING

- NPV: \$24,000
- ROI: 41%
- Contribution to Goal: 11%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### SOLAR THERMAL SYSTEMS

- NPV: -\$21,000
- ROI: -63%
- Contribution to Goal: 1%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### EXISTING BUILDING COMMISSIONING

- NPV: \$124,000
- ROI: 96%
- Contribution to Goal: 11%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### HVAC CONTROLS

- NPV: \$174,000
- ROI: 136%
- Contribution to Goal: 4%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### EXPANDED SERVICE HOURS WORK WEEK

- NPV: \$765,000
- ROI: ∞\*
- Contribution to Goal: 44%
- Lead Department/Division: City Manager's Office
- Responsibility: Deputy City Manager

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞

## RESOURCE CONSERVATION & EFFICIENCY - ENERGY

Infrastructure old and new, requires energy for safety, comfort and productivity. That energy – primarily derived from natural gas, nuclear power, coal and oil – affects pocketbooks, natural places and personal health. Pollution from using these resources increases health risks and destabilizes the climate.

Local, renewable energy sources provides a safe alternative to risky and polluting resources. Conservation and efficiency represent the best options because the cheapest and cleanest form of energy is the energy we avoid using through the recommendations included in this SAP.

The City of Hallandale Beach has begun reducing its energy use and aspires to produce some of its own energy with renewables in the future. The stated goal is to reduce operational electricity use by 20% by 2022, using a 2016 baseline. Translated to dollars if this policy is achieved, over \$200,000 would be saved annually by 2022 over the baseline.

The primary source of power used community-wide in Hallandale Beach – with the exception of automobiles – is electricity. In 2016, the entire Hallandale Beach community (City operations and external, community-wide operations) spent over \$51 million on 492 million kilowatt hours of electricity. Power use in the City has grown four percent since 2014, while expenditures have decreased by four percent, reflecting a reduction in the cost of electricity.

More work remains to help improve the way the community uses energy – local governments have a role to play in getting it done. The City offers free LED luminaires and smart power strips to residents. Residents have access to Property Assessed Clean Energy Financing, which offers up-front capital for energy efficiency and renewable improvements. The East Broward Solar Co-Op recently offered cooperative purchasing of solar energy to Hallandale Beach residents. Through the Comprehensive Plan (CP), the City is committed to enforcing the Florida Building Code, in particular the Energy Code, which is one of the strongest in the nation. This commitment is furthered by the City's Green Building Program, which establishes minimum standards for energy efficiency in large commercial and multifamily new construction projects.





## PROJECTS

The SAP team has identified six energy projects aimed at reducing the City's dependence on certain fuels, including LED Streetlights, LED Interior Lighting, Solar Thermal Systems, Existing Building Commissioning, HVAC Controls and Expanded Service Hours Work Week. These projects are expected to yield a discounted net benefit of over \$1.1 million over the next ten years, and achieve 84% of the 2022 energy reduction goal. As the City implements these projects, it expects to encounter additional opportunities to reduce consumption and fulfill the stated goal.

### LED STREETLIGHTS

Rapid changes in the availability and cost of LED lighting has resulted in the potential to significantly reduce the energy intensity of certain lighting applications, such as street lighting. LED lights are more efficient than their high intensity discharge (HID) counterparts. The City has utilized exterior LED lighting on a pilot project basis, for example, exterior lighting at the City Hall Complex. Now the target is to replace all of the City's approximately 386 City-owned streetlights with LED lighting. LED lighting owned by FPL is currently being replaced under an agreement with the utility. These retrofits began in February of 2018 and will be completed in May/June of 2018.

Currently, the City-owned streetlights consume 470,000 kWh of electricity annually at a cost of about \$75,000 per year. These streetlights will be replaced with LEDs of similar aesthetics and performance.

The delivery method is yet to be determined, since options to enter into a public-private partnership exist for such projects. However, for planning purposes, this project assumes traditional project delivery with an upfront cost of about \$193,000 phased over three years.

Benefits of this project include avoiding the electricity consumption associated with the current, less efficient fixtures and lamps. An average energy and cost savings of 40% is projected. Savings also include avoided maintenance costs based on a weighted average resource rate of \$0.16 per kilowatt hour sourced from historical FPL billings that include electricity and maintenance costs. Benefits do not include commercial energy efficiency rebates that may be available from FPL.



## RESOURCE CONSERVATION & EFFICIENCY - ENERGY

As a government, the City spent approximately \$894,000 on about 10,200 megawatt-hours (MWh) of electricity to power government facilities and infrastructure in 2016. Like the community as a whole, City government power use has increased by eight percent since 2016, while expenditures have decreased by nine percent. This decrease in cost is not guaranteed in the future and a continual increase in power derived from non-renewable sources of energy will result in a larger impact on our climate and planet. Furthermore, the full cost of energy extraction is not included in the price that the consumer pays. This leads to a greater amount of environmental destruction than would otherwise occur if the market were to properly value externalities. As a vulnerable coastal community, Hallandale Beach should lead by example and reduce its energy consumption.

In recent years, the City has undertaken several initiatives to improve the energy efficiency of its operations. In 2014, the City entered into a performance contract with Siemens, which attracted about \$660,000 in private investment in lighting efficiency improvements in City facilities. A performance contract provides upfront investment in energy efficiency projects. It guarantees projected savings and is structured so that savings help pay for the investment overtime. The City recently reached an agreement with FPL to replace over 1,600 existing streetlights with energy efficient LED luminaries. This will result in an energy savings of more than 400,000 kilowatt-hours (kWh) per year and a reduction of about 280 metric tons of greenhouse gas emissions per year – equivalent to removing 37 homes from the grid or removing 60 cars from the road. The project will be completed by the middle of 2018.



Action



## LED INTERIOR LIGHTING

As with streetlights, LEDs can significantly reduce lighting energy use inside City facilities. With this project the City aims to replace about 7,000 existing T8 fluorescent lamps with more efficient, longer-lasting LEDs.

In 2014, as part of a performance contract with Siemens, interior lighting was upgraded to the most efficient fluorescent lamps available at the time. The contract stipulates that the City remain responsible for maintenance of the luminaries and fixtures until 2029. By 2021, these lamps will be about seven years old and many will be beginning to fail. Replacing them with LED lamps and disconnecting existing ballasts will save about 30% of energy use, cost and will significantly reduce ongoing maintenance. This is due to the fact that LED lamps will last at least twice as long as those being replaced.

## SOLAR THERMAL SYSTEMS

Replacing electric or natural gas powered water heaters with solar water heaters can be cost effective in applications where the demand for hot water is high.

Fire and police stations are often good candidates for solar thermal systems, since they are staffed around the clock and equipped with full bathrooms and kitchens. Fire stations across Florida, including Jacksonville and Boynton Beach, have installed solar thermal systems to provide a large fraction of total hot water demand. Hallandale Beach's new Main Fire Station, currently under construction, will feature a solar thermal system.

This project aims to expand the use of solar thermal systems in the City and will reduce annual energy consumption for water heating in Fire Station 7, Fire Station 60, Fire Station 90 and the police building by 93% annually. These facilities are assumed to have high hot water consumption, resulting from showering, dish washing, clothes washing, etc. Vehicle wash systems in use at the City that use hot water are also good candidates for solar thermal systems, but are not presently included in the project.

The project will involve procurement of design and construction services for small, roof-mounted, solar thermal systems at each location. Costs include professional services to complete the system design and construction and are estimated at \$35,000. Benefits are based on reducing electric consumption. Benefits beyond year 10 are not captured.

Positive ROI is not achieved within 10 years, however, the life of the systems is about 30 years and the project may be expected to pay for itself within that time period.

## EXISTING BUILDING COMMISSIONING

Existing Building Commissioning (EBCx) is a systematic process for investigating, analyzing and optimizing the performance of building systems through the identification and correction of deficiencies. The process verifies that the building and its systems meet current requirements, improves energy and water performance, resolves operations, controls and maintenance problems, reduces or eliminates occupant comfort complaints, improves indoor environmental comfort, and documents system operations. For all of these reasons, EBCx is widely recognized as among the most cost-effective energy efficiency solutions available.



This project will involve EBCx for the City's largest and most complex facilities, including the City Hall Complex (City Hall, Police, and Cultural Center), OB Johnson, Foster Park and the Public Works Administration Buildings. An investment-grade energy audit conducted in 2014, and facility walk-throughs conducted in 2017 and 2018, indicated that the City's major facilities could benefit greatly from EBCx. Typically electric savings of about 15% are possible, in addition to, water conservation, thermal comfort and maintenance savings. Professional services will be procured and the City will implement all low-cost/no-cost and selected capital-intensive recommendations identified by the process.

Best management practice recommends re-commissioning key facilities on a regular cycle to maintain a high level of performance, while capturing new opportunities to improve operations. This project plans for one cycle of re-commissioning based on a five year period.

Professional commissioning services costs are estimated at \$0.50 per square foot. An additional investment of about \$30,000 is estimated to implement corrective actions identified by the process. A Lawrence Berkeley National Laboratory meta-study found typical simple investment payback in commissioning averages 1.8 years with a range of 0.5-3.5 years. The project conservatively estimates a 2.8 year payback period.



Action





# Build < Happiness



## Action

### HVAC CONTROLS

Building automation systems (BAS) save energy by monitoring, scheduling and operating major building systems, such as heating, ventilation and air conditioning, via an electronic network of computers, sensors and mechanical actuators. Scoped appropriately for the medium- to small-sized buildings operated by the City, BAS can cost-effectively reduce energy use by 10 – 30%.

An investment-grade energy audit conducted in 2014 and a facility walk-through conducted in 2018, indicated that most of the City's HVAC systems operate 24 hours per day, seven days a week, regardless of occupancy or utilization. This project aims to save 14% of total electric billings by updating the BAS at the City Hall Complex to a modern, digital system with a software front end capable of remotely monitoring and controlling systems across the City. Controllers and actuators at the City Hall Complex will be upgraded as necessary. Networked rooftop unit (RTU) controllers, networked programmable thermostats, networked sensors and associated electrical equipment will be installed at the Cultural Center, Fire Station 60, Fire Station 90, Hepburn Center, DPW Compound, Golden Isles Tennis Center and Foster Park. Smaller, simpler buildings will install a networked thermostat. The networked BAS will be periodically re-commissioned to ensure proper operation.

The estimated cost for installation and configuration of a BAS, including software, controls hardware and wiring, is estimated at \$220,000. Implementation will take place over two years, beginning in 2019 at the City Hall Complex and completing additional sites during 2020. Savings are estimated at about \$380,000 over 10 years.

### EXPANDED SERVICE HOURS WORK WEEK

One of the obligations of public service is to maximize the efficiency of public expenditures. Expanded service hours allows the City to meet or exceed current levels of service, while realizing significant savings in operational expenses and increases in employee satisfaction.

This project would strategically transition some aspects of City operations to an expanded service hour work week model. Under this model work schedules shift from a five-day week to a four-day week. During those four days, the hours of service provided are extended, providing a greater window of access to citizens.

There are currently nine cities in Broward County, as well as some divisions of Broward County, that operate within an expanded service hours work week model, including Coconut Creek, Margate, Tamarac, Lauderdale Lakes, Lauderhill, Wilton Manors, Pembroke Pines, Miramar and Hollywood. Non-Broward cities that operate this schedule include Miami Beach, Miami Gardens, Wellington and West Palm Beach. Hollywood, Margate and Tamarac, have transitioned to such a schedule and documented significant savings in water, energy, fuel, overtime and sick leave usage expenditures. Furthermore, a recent article published by Excellence in Government stated that there are three key factors that allow a government organization to attract and retain young talent. One of these factors is the presence of a flexible work arrangement. The private sector is also beginning to incorporate such arrangements. Richard Branson, the CEO of Virgin, espouses this philosophy. In a recent Freakonomics podcast he stated that many American companies lack the capacity to motivate people, which translates to low productivity. He believes that flexible work arrangements build trust with employees and employees in return will give more of themselves to their place of work.

To consider in detail the transition to an expanded service hour work week model, staff will compile a report on the results achieved by peer cities. Citizens and staff will be surveyed to gather their input and gauge their receptiveness. A potential program design based on peer data and survey results will be presented to the City Manager for consideration. Extensive outreach to residents and businesses will be necessary in order to increase awareness of potential changes in City hours of operation. Staff education may be necessary, depending on what type of system the City adopts.



## Action

For example, if the City adopts a four-day work week it must ensure that all staff adhere to the policy in order to achieve expected savings and complete work tasks. It may also be that certain departments will benefit because of the department's infrequent public contact and others cannot make this transition because of the need to meet the public seven days per week.

The key to this project is gaining flexible control of the City's major building systems. Accomplishing this is discussed above in Project RC8. HVAC Controls.

The expanded service schedule has the potential to save close to \$900,000 over 10 years from energy, water and fuel savings alone. A similar amount of savings from avoided overtime and sick leave may also be possible. However, because less certain, these latter benefits are not included in estimates at this time. Estimated cost savings are based on those reported by Hollywood, FL and Miramar, FL after those cities transitioned to an expanded service hours format. These two cities realized about \$460,000 and \$410,000 per year in avoided water, electricity, fuel, overtime and sick leave usage, respectively. Savings are conservatively estimated at 42% and 66% of this level, respectively, then averaged, given the ratio of Hallandale Beach's employees to Hollywood (1,271) and Miramar (806).

Further, employee satisfaction in the City of Hollywood has shown significant improvement since the transition. The number of employees reporting that they were "very happy" increased by 41% and employees rating their emotional/mental condition as "extremely high/high" increased by 14%, while those that rated their emotional/mental condition as "low and extremely low" decreased by 42%. Similar increases in employee satisfaction, leading to improved employee recruitment and retention, can be expected in Hallandale Beach.

This proposed project showcases that sustainability initiatives have the capacity to provide positive benefits to the environment, economy and society.





## FUTURE STEPS

The City will continue identifying opportunities to cost-effectively use energy more efficiently and generate energy from renewable resources. **Some initial directions for future projects include:**

### HIGH PERFORMANCE HVAC UPGRADES

The City should purchase and install premium efficiency equipment when replacing heating, ventilation and air conditioning (HVAC) units currently in “poor” condition. Premium efficiency equipment can be defined as HVAC equipment with efficiency ratings beyond the minimum required by the Florida Building Code. For example, for split system HVAC units, code requires a minimum Seasonal Energy Efficiency Rating (SEER) of 14. Paying the relatively low incremental cost for a 16 SEER unit can produce energy savings far in excess of the extra upfront cost over the 10 – 20-year life of the unit. The cost of service for HVAC units typically increases with age. Therefore, accelerating the rate of unit replacement for those reaching the end of their useful life can also reduce annual maintenance expenditures. The City is currently investigating options for upgrading HVAC equipment at the Department of Public Works Compound, including the Administrative building, Generator Electrical Room, Pump Room High Service and the Water Treatment Plant.

### MOTOR EFFICIENCY UPGRADES

The City operates a water plant with several large pumps, as well as nine pump and 15 lift stations. These pumps are a major contributor to utility energy consumption, the City’s single largest category of electricity consumption. Use of premium efficiency motors (standardized by the National Electrical Manufacturers Association) as replacements for older models can increase efficiency by three to six percent, resulting in significant savings for motors with large load factors. Older, general-purpose, low-voltage motors between 10 and 500 horsepower and in service more than 25% of the time are good candidates for replacement upon repair or failure. Variable frequency drives (VFDs) may be installed on larger motors where constant volume is not required. Savings from 10 to 60% are possible if the fan or pump is designed to operate between 40 to 80% of full speed, typically resulting in quick ROIs. Currently, high service and transfer pumps are being replaced. Staff at both the water plant and in Public Works have expressed interest in utilizing VFD and detailed studies will occur as replacements are needed.

### ATHLETIC FIELD LIGHTING EFFICIENCY AND CONTROLS

The City operates several athletic fields lit at night by high mast, high-intensity discharge flood lamps. These fixtures use a large amount of energy, are expensive to maintain and introduce light pollution into surrounding areas. LED technology is now available for such applications. LED technology will reduce energy use, maintenance costs and, because the light supplied is far more directional, light pollution. The installation of control systems that

would allow staff to schedule and automate lighting remotely would lead to substantially reduced expenditures on athletic field lighting and improve the quality of life of neighbors.

### EFFICIENT GLAZING

Energy efficient window technologies, including low emissivity glazing, exterior coatings, and interior or exterior shades can reduce the solar heat gain in buildings, reducing the energy required to cool interiors and increasing occupant comfort. In new buildings, or in existing buildings where windows will be replaced, efficient glazing will be specified as part of a design guideline. Where existing windows will remain in place for the foreseeable future, solutions such as exterior coatings or interior/exterior shades as options will be investigated. A pilot project could be developed for a specific building or exposure, in which a product could be tested by monitoring electric consumption pre and post treatment

### SOLAR POOL HEATING

Hallandale Beach operates several swimming pools. Utilizing solar energy to heat the pools is a potential cost saving alternative to electric or natural gas heat. Solar pool heaters use the pool’s existing filtration pump to move water through polypropylene plastic collectors that are mounted to a south facing roof and back to the pool. A solar thermal pool heating system installed on a 3,640 square foot pool at the University of South Florida, St. Petersburg resulted in \$10,000 in savings the first year, with a 3-year simple payback period.

### SOLAR PHOTOVOLTAICS

Solar photovoltaic (PV) systems collect solar energy and convert it to electricity for use in buildings and other applications. PV modules are typically installed on a south-facing roof or installed in ground-based arrays. Power generated by the modules is converted from DC to AC current via integrated or centralized inverters. Commonly, the power generated is utilized immediately, with any excess sent to the grid. Batteries may be used to store extra power. However, batteries increase the cost of PV systems significantly. The cost and efficiency of solar photovoltaics, utilized to generate electricity by collecting solar energy, continues to decrease year after year. Nevertheless, its applicability in the State of Florida is limited by regulatory barriers. Further, many of the financial incentives provided by the federal government to encourage adoption of solar technologies are not available to tax-exempt entities like the City. Nevertheless, innovative financing and ownership models that have been utilized in the state may enable the city to pilot use of solar power. For example, the City of Orlando has installed a large (420kW) solar PV array on the roof of its fleet garage. The project was enabled via a power purchase agreement (PPA) with its municipal utility, whereby the utility leases city roof area and installs, operates and owns the PV array. The city pays the utility only for the solar power produced by the roof-top array at a fixed rate over an extended period of time. Many cities in Florida have implemented solar projects without such methods, choosing to install and operate PV systems using city funds, sometime supplemented by grant funding. In these cases, the financial performance of the project may suffer.



Action





## Action

# RESOURCE CONSERVATION & EFFICIENCY - WATER

One of the defining characteristics of Hallandale Beach is its water. Keeping the City's waterways clean and healthy is a priority. Meanwhile, Hallandale Beach's drinking water resources, like the rest of South Florida, are increasingly stressed by population growth, saltwater intrusion and changes in the frequency and intensity of precipitation.

The City operates a water utility that provides water to nearly all areas within its limits. It receives a water withdrawal allocation from the South Florida Water Management District (SFWMD). This allocation limits the amount of water that the City can withdraw from the aquifer via its wells. The City's permit expires in 2033 and it is not known if the future permitted allocation will remain constant or if it will include an increase or decrease. It is in the best interest of the City to replace or reduce its potable water usage as much as possible.

Since 2007, the City has experienced significant reductions in water consumption, due to water restrictions imposed by the SFWMD. More recently, however, community water consumption (internal City operations and external community-wide operations) in Hallandale Beach has increased by six percent. This is partially due to population increase, but per capita consumption has grown by three percent since 2014. The importance of stewardship of the City's water resource is underscored by a projected addition of more than 3,000 residential units over the next 10 years.

In FY 2016, City facilities used 4.26 million gallons (MG) for indoor uses and 18.42 MG for irrigation, at a cost of \$66,000 respectively. Water use in City facilities shows a declining trend from 2014 to 2016.

The City has long recognized that conserving drinking water resources and managing storm water can cut costs and meet demand without compromising natural systems. Water customers are charged an increasing block rate for consumption and, through a partnership with Broward County, the City offers rebates and permit fee waivers for low-flow toilets. Ultra-low flow fixtures are required for new construction, irrigation is restricted to once per week, and xeriscaping using native plants and use of reclaimed water are encouraged. The City operates a water utility leak-detection program, analyzing, replacing and calibrating meters on a regular schedule. As a result, the City has achieved an estimated system loss of four percent, well below the 10% allowed by the SFWMD. Utility staff have been working to reduce inflow and infiltration (I&I) associated with its storm water system for over two decades. The City participates in Broward County's NatureScape program, which encourages water efficient landscaping practices. Through this program the City has saved 10 million gallons and \$13,500 per year at City facilities and parks. The program does not include landscaping in roadway medians.



### INDOOR WATER FIXTURE AND FITTINGS EFFICIENCY

- NPV: \$23,000
- ROI: 131%
- Contribution to Goal: 19%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### IRRIGATION EFFICIENCY

- NPV: -\$7,000
- ROI: (3%)
- Contribution to Goal: 61%
- Lead Department/Division: Public Works
- Responsibility: Operations Manager

### EXPAND WATER REUSE PROJECTS

- NPV: \$148,000
- ROI: 45%
- Contribution to Goal: 5%\*\*
- Lead Department/Division: Public Works
- Responsibility: City Engineer

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞

\*\*Since this project benefits both city operations and community water use, contribution to goal is calculated relative to the SAP's 2040 Goal of reducing community water use by 40%.

# PROJECTS

This SAP's goal is to reduce total operational water use 20% by 2022 from our 2016 baseline. The City will begin by implementing three projects projected to achieve 84% of its initial goal: Indoor Water Fixture and Fittings Efficiency, Irrigation Efficiency and Expand Reuse Water Projects. Looking to the future, the City will strive to reduce total drinking water consumption for both City operations and the community by 40% by 2040. There are several next steps the City can take to move towards this goal.

## INDOOR WATER FIXTURE AND FITTINGS EFFICIENCY

High-efficiency plumbing fixtures or fittings can be easily incorporated into existing City-owned buildings. While replacement of fixtures is sometimes necessary, in most cases reduced-flow accessories (e.g. flow restrictors, flow regulators, aerators and laminar flow devices) can be added to existing fixtures. For lavatory and kitchen faucets, fixtures or accessories specified with a maximum flow of about 0.5 and 1.0 gallons per minute (gpm), respectively, will save water relative to standard fixtures. For showers, 1.5 gpm fittings will be specified. Lower-flow fixtures and fittings are also available and may be appropriate in certain cases. Reducing flow rates of fixtures that supply hot water will also save energy required to heat water.

Indoor water use may also be significantly reduced by utilizing high efficiency toilets and urinals. At minimum, 1.28 gallons per flush (gpf) models for toilets and 1.0 or less gpf urinals replace 3.5 gpf fixtures/bowls and valves. While retrofits are usually less effective than replacement, retrofits may be made to toilets that allow a "dual flush" mode.

A 2014 audit of City facilities indicated that most fixtures/fittings were not low-flow. This project aims to systematically upgrade fixtures at all major City facilities. Staff will accomplish this by incorporating low-flow devices into designs for upcoming major renovations. Fixtures in remaining facilities will be audited and a schedule for replacement will be developed. As part of these efforts, a design standard for water fixtures in City facilities will be developed.

The project will reduce annual water consumption by about 20% by 2022 in targeted buildings. This will help achieve about 19% of the City's 2022 water conservation goal. Implementation costs are estimated at \$22,000. Investment is expected to be phased over two years. Benefits amount to about \$50,000 over 10 years. Benefits result from both water and electric utility savings. This is because energy is used to heat water, this reduction in water consumption will result in an associated reduction in energy used.



## RESOURCE CONSERVATION & EFFICIENCY - WATER

Ocean outfall of wastewater will no longer be allowed in Florida by 2025. Therefore, cities with wastewater treatment plants must find alternative ways to dispose of wastewater. The City has a Reuse Water Systems Policy for developers. This policy states that all new developments and/or substantial improvements shall install a reuse water system for irrigation that can service the entire development. The City has established routes for the major distribution (transmission) lines of the reuse water system, which is constructed of purple PVC pipe to distinguish it from potable systems. Reuse water is currently used by the Diplomat Golf Course. Recently, reuse water distribution was extended to Scavo Park.



Action







Action

### IRRIGATION EFFICIENCY

Irrigation is the City's primary source of potable water use. Efficient sprinkler heads, weather- or sensor-based irrigation controls and properly maintained systems can substantially cut potable water used for irrigation.

While the City has begun using low-flow irrigation equipment, this project will implement a comprehensive program to replace all systems with more efficient sprinkler heads, drip irrigation and weather and sensor-based controls that will allow centralized monitoring, scheduling and operation. These measures will allow for more efficient operation and maintenance of the City's irrigation systems, ensuring potentially costly issues are addressed proactively.

These actions target a 15% reduction in potable water used for irrigation.

Implementation costs are estimated at \$75,000, staged over five years. Benefits include \$73,000 in water savings. The project is expected to achieve 61% of the City's water conservation goal. Project benefits may improve if the cost of water increases more rapidly than the estimated escalation factor of 2.4% annually in the future.

### EXPAND REUSE WATER PROJECTS

Alternative water supplies are important for conserving existing potable water supplies and meeting future demand.

The City of Hollywood currently treats Hallandale Beach's wastewater. Wastewater can be used as reuse water once it is heavily treated and is a viable alternative to ocean outfall. Reuse water is a resource that can help the City conserve potable water and help its neighbors avoid wastewater discharges. Figure 2 illustrates expanded water reuse project phasing.

The City of Hollywood's water treatment plant delivers reuse water sourced from Cooper City and Davie to Hallandale Beach. The City has established infrastructure to distribute this reuse water (via purple PVC pipe) for use in irrigation. So-called "purple pipe" water is currently used by the Diplomat Golf Course.

Recently, using Florida Department of Environmental Protection (FDEP) grants amounting to \$440,000, reuse water distribution was extended from Wiley Street in Hollywood to Scavo Park, medians located at north, south and west of the intersection of Three Islands Boulevard and Atlantic Shores Blvd, and residential areas west of Three Islands Boulevard between NE 11th Street and Parkview Drive (Phase 1).

This project (Phase 2) will involve installation of a reuse water line down Three Islands Boulevard from Scavo Park to East Hallandale Beach Boulevard. This water line will be designed to have the capacity to irrigate medians on East Hallandale Beach Boulevard. In addition, it will serve office building irrigation use, residential areas and landscaped medians along Parkview Drive and Leslie Drive.

While not included in the project currently, an extension from Three Islands Boulevard/East Hallandale Beach Boulevard west down East Hallandale Beach Boulevard to Federal Highway (Phase 3) could be included in the near future.

**Alternative water supplies are important  
for conserving existing potable water supplies  
and meeting future demand.**





## Action

Staff will request funding for the design of this project during the FY18/19 budget process. After October 1, 2018, staff will procure professional design services. Commission approval will be required to approve the design services. The design phase is expected to take five months. Thereafter, the City will issue an Invitation to Bid and staff will provide education and outreach to the community. The Construction Phase is expected to last six months.

The cost of the project is about \$500,000, with approximately \$90,000 going to design and the rest for construction. Costs are estimated based on the cost for the extension to Scavo Park. Benefits include a savings of about \$770,000 in avoided potable water use charges. Benefits are calculated assuming a 96% cost reduction for reuse water compared to potable water. Since private users will be allowed to access reuse water for irrigation, benefits accrue both to the City government and the community. This potable water savings realized through this project will help achieve five percent of the City's 2040 goal to reduce community water consumption by 40%.

FIGURE 2: EXPAND WATER REUSE PROJECT PHASING



...staff will provide education and outreach to the community...

## FUTURE STEPS

Several other opportunities to economically reduce water use and lessen the City's impact on water supplies exist. **Some initial directions for future projects include:**

### GREYWATER REUSE

Hallandale Beach is taking steps to expand the availability of reuse water and is encouraging developers to prepare for its use. Greywater is a complementary alternative water source that can be captured and reused on site to conserve potable water. Greywater captures wastewater from sinks, showers, bathtubs and washing machines for irrigation on site. Greywater systems are scalable from single family homes to large multifamily developments.

The City could promote greywater through conducting a pilot project at a City facility (e.g. Sunrise Park). Based on results, the City could develop education, policy and incentives aimed at developers, residents and contractors. In order to design a program, the City would review case studies from cities such as Atlanta, Los Angeles and Seattle. Then, staff would develop the program and communicate it to citizens. Significant education would be required to counteract common misunderstandings related to greywater, including safe sources and applications.

### HVAC CONDENSATE HARVESTING

Water vapor condenses when it comes in contact with cooling coils in HVAC equipment. Water is drained from the equipment to prevent corrosion and often plumbed to the sewer. Approximately 10 gallons per day per 1,000 square feet of air conditioned space can be captured. At the City, as much as a half a million gallons of condensate water (after filtration and disinfection) may be available for capture annually for irrigation and other appropriate uses, such as cooling tower efficiency, while reducing sewer flows.

### COOLING TOWER EFFICIENCY

Cooling towers dissipate heat from recirculating water used to cool chillers and air conditioners. Heat is rejected to the environment from cooling towers through the process of evaporation. By design, cooling towers use significant amounts of water, accounting for up to 25% of a facility's total water consumption. Water is lost through cooling towers through evaporation, leaks or overflows and blowdown. Blowdown is water discharged from the system, typically to a drain. Blowdown water is replaced with fresh makeup water to maintain an appropriate concentration of dissolved solids. Dissolved solids must be kept at an appropriate level of concentration to avoid scaling, biological growth and corrosion.

In many cases, the amount of blowdown for a cooling tower is greater than necessary, resulting in wasted water. Optimizing the blowdown rate can save water. If appropriate, alternative sources of makeup water may also be used, such as condensate from air handlers or reuse water.

### PROCESS WATER EFFICIENCY

The City utilizes water for processes like vehicle washing, food service (e.g. ice-machines, dish-washing, food disposals) and pools (e.g. filtration). Water reclamation systems hold potential for saving water used in vehicle washing. In the food service sector, various water efficiency technologies are available including pre-rinse spray valves. In pools, evaporation and filtration are areas for potential savings.



Action







## Action

# RESOURCE CONSERVATION & EFFICIENCY - FLEET

Fossil fuel from foreign countries power much of our nation's transportation and poses risks to national security, our economy and environment. Hallandale Beach's fleet of vehicles, police cars and refuse trucks is no different. Even when sourced domestically, as is increasingly the case, gasoline and diesel pollute the air, toxify soil and waterways and contribute to climate change.

A leaner fleet, comprised of more fuel efficient, alternatively fueled vehicles will reduce dependence on volatile-priced gasoline and diesel, while reducing noise and pollution. The goal is to reduce fossil fuel use (i.e. gasoline and diesel) by 10% from the City's 2016 baseline by 2022. This plan also contains great ambition for the future. By 2040 the City will strive to replace 90% of baseline gasoline and diesel use with fuel efficiency or alternative fuels, such as biofuels, natural gas, propane and electricity.

The City spends approximately \$2.1 million per year maintaining and fueling its fleet of 374 on-road and 71 off-road vehicles. The majority of this expenditure is for maintenance (approximately \$1.6 million). In 2016, nearly \$500,000 was spent on 309,000 gallons of fuel. The City utilizes gasoline, diesel and compressed natural gas (CNG). No vehicles currently use electricity, propane Autogas or biodiesel fuel. Hallandale Beach has approximately 0.70 on-road vehicles per employee, slightly higher than the cities of Sunrise (0.66) and Coral Gables (0.68). A study is currently underway to reduce the size of the City's fleet and the findings will be incorporated in the FY18/19 budget process. A project below initiates the process of "right-sizing" the City's fleet.

The average age of the fleet is approaching eight years old. For all on-road vehicles, the annual number of vehicle miles traveled (VMT) is small, averaging less than 5,000 miles per year. While this may be due to the relatively small area of Hallandale Beach, it is also due to a high number of lightly-used vehicles. About two thirds of on-road vehicles traveled less than 12,000 miles in a year.

The City of Hallandale Beach is already taking steps to manage the vehicle fleet to maximize efficiency and control costs and pollution. The City prepared a "Green Paper" on alternative fuels in 2012. The study included a series of ideas to improve the performance of the fleet, including idle-reduction technology for police and rescue vehicles, CNG refuse trucks, a CNG/alternative fuels station at or near the Department of Public Works and branding/communications.

Since publication of the Green Paper, the City expanded its CNG refuse truck fleet to a total of eight trucks. CNG cuts air pollution and reduces greenhouse gas emissions by up to 30%, while eliminating the risk of toxic fuel spills. Initially, these vehicles were fueled at the nearby City of Hollywood Fuel Station. However, this station closed in 2016, forcing the City to fuel these vehicles in distant Pompano Beach at a higher cost per gaseous-gallon equivalent, plus, the down time necessary to drive to and return from the facility. The next step for the City will be to investigate its opportunities to develop alternative fuels infrastructure. The City has started this process by planning two new, publicly-accessible, electric vehicle charging stations as part of the redevelopment of Bluesten Park and the Main Fire Station.



## ELECTRIC VEHICLES AND INFRASTRUCTURE

- NPV: \$71,000
- ROI: 287%
- Contribution to Goal: 25%
- Lead Department/Division: Public Works
- Responsibility: Fleet Administrator

## INCREASE FUEL ECONOMY

- NPV: \$118,000
- ROI: ∞\*
- Contribution to Goal: 25%
- Lead Department/Division: Public Works
- Responsibility: Fleet Administrator

## RIGHT-SIZE FLEET

- NPV: \$447,000
- ROI: 524%
- Contribution to Goal: 10%
- Lead Department/Division: Public Works
- Responsibility: Fleet Administrator

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞

\*\*Since this project benefits both city operations and community water use, contribution to goal is calculated relative to the SAP's 2040 Goal of reducing community water use by 40%.



Action

Embrace < Change

## PROJECTS

The SAP accelerates the City's commitment to a green fleet by including three projects; Electric Vehicles and Infrastructure, Increase Fuel Economy and Right-size Fleet. These projects will produce about \$636,000 in discounted net benefits over 10 years – at no net cost. While these efforts are currently projected to leave the City short of its 10% gasoline and diesel reduction goal (by year 2022), the City is already considering several next steps described below that are capable of creating cost-effective cuts to its current fuel budget and will strive to incorporate such opportunities into planning for the future.

### ELECTRIC VEHICLES AND INFRASTRUCTURE

Electric vehicles (EVs) have a substantially lower fuel cost per mile than gasoline vehicles. Meanwhile, the purchase price of EVs continues to decrease. They are now available to the City via a statewide procurement contract. As a result, EVs are good choices for replacing light-duty cars with high annual mileage or fuel consumption.

This project, will replace the most utilized passenger vehicles and light trucks aged seven or more years with EVs, where operationally feasible. Ten such vehicles have been preliminarily identified and will be replaced over two years. Purchase of additional EVs after FY19/20 will be contingent upon cost-effectiveness relative to alternatives. Vehicles will be replaced with the Nissan Leaf or equivalent. Technicians will be trained on EVs maintenance, as necessary. Vehicles will be decommissioned from the fleet after seven years and sold at auction.

EVs require electric vehicle support equipment (EVSE) to keep vehicles charged. The City is already moving forward with plans to install publicly-accessible EVSE at Blusten Park. To support 10 new EVs procured over the next three years, the City will install dedicated EVSE at the City Hall Complex, the Public Works compound and other strategic locations.

Careful planning will be required to site EVSE in appropriate locations, including the effect it will have on availability of parking, since Florida law prohibits vehicles with an internal combustion engine from parking in a spot designated for electric vehicle charging (Florida Statutes 366.94).

Since the new EVs will replace vehicles nearing the end of their useful life, the project considers the incremental cost of replacement with an electric model. This incremental cost is conservatively assumed to be the difference in procurement cost for a Nissan Leaf or equivalent and an average compact vehicle as defined by the current Florida DMS contract.

Based on current terms, is the incremental cost is approximately \$6,000 (e.g. \$28,500 vs. \$22,500). Incremental costs going forward will be monitored to determine whether further EVs procurement is cost effective relative to fuel-efficient vehicles. Salvage value is estimated to be \$2,500. The installed cost of EVSE is assumed to be \$2,000 per charge point. The total project cost of about \$80,000 is offset by the salvage value of replaced vehicles and fuel and maintenance savings, which area estimated at about \$170,000 over 10 years.

### INCREASE FUEL ECONOMY

New vehicles are more fuel efficient than in the past. Procuring new, high-efficiency models to replace older vehicles can reduce fuel use and save money. Replacing larger vehicles with compact alternatives, where appropriate, will increase these benefits.

This project will improve the average fuel economy of the City's fleet by procuring high-efficiency vehicles to replace less efficient vehicles.





## Action

At least 16 light-duty vehicles have been identified as good candidates for replacement, given their fuel economy, age and usage. These will be validated and an appropriate vehicle with annual fuel economy at least 50% greater than present will be specified using the current Florida DMS contract (e.g. 27 mpg vs. 18 mpg). In order to preserve the plan rate of fleet replacement, this project will be phased in over three years beginning in FY19.

The project assumes no additional cost to the City, since replacement with high-efficiency vehicles should not require any incremental cost. This is because corporate average fuel economy has increased by more than 50% over the last 10 years and fuel-efficient models are typically cheaper than more energy-intensive alternatives. This strategy is premised upon a comparison between the incremental costs of fuel efficient or electric vehicle alternatives. These costs will be monitored and preference will be given to replacement with electric vehicles, where cost-effective. The replacement of 16 vehicles with fuel efficient models is expected to save about \$135,000 over 10 years.

## FUTURE STEPS

Opportunities to conserve fuel and boost the efficiency of fleets are developing rapidly. In order to achieve its goals, the City will monitor these trends and prudently pursue cost-effective solutions as they mature.

**Future projects may include:**

### PROPANE VEHICLES

Propane (Autogas) is a domestic fuel that is cost-competitive with gasoline and diesel. It has environmental benefits relative to those fuels and is widely available, since propane distributors will install a fueling station at no upfront cost in exchange for a contract to purchase the fuel.

Currently, Autogas vehicles are best suited for mid-duty applications, such as cargo vans and maintenance trucks. The relatively low incremental cost of such vehicles and the ability to finance on-site fueling stations through long-term fuel purchase agreements, makes Autogas a potential solution for the City's fleet.

### BIOFUELS

Biofuels include biodiesel and ethanol. These fuels are sourced from plant or animal-based feedstocks, such as soybeans, corn, waste vegetable oils or animal fats, which result in less pollution than gasoline or diesel.

While not currently used in the City's fleet, blends up to 20% biodiesel can be used in existing diesel vehicles and up to 85% ethanol in existing "flex fuel" vehicles without significant changes to maintenance or damaging engines. Biofuels can often be procured in bulk quantities via negotiated contracts at a price equivalent to diesel or gasoline. While the City cannot expect fuel cost or use savings via biofuels, they can be utilized in many vehicles with little or no modification.

### ANTI-IDLING

The U.S. Department of Energy estimates idling vehicles burn from a quarter to a whole gallon of fuel per hour for a total of 2 billion gallons of fuel per year nationwide. Many municipalities in the U.S. have enacted anti-idling policies as an effective, low-cost way to save money and fuel to reduce engine wear, emissions and noise.

In some cases mission-critical applications, such as electronics and climate control in a police K9 unit, require vehicles to idle. Auxiliary Power Units (APUs) can solve this problem via a battery backup system. However, recent case studies have indicated that APUs providing air conditioning are not yet durable, cost-effective or compatible with the needs of the City's fleet.

The City will continue to monitor solutions for anti-idling as technology develops.

### VEHICLE MILES TRAVELED REDUCTION

Reducing the vehicle miles traveled (VMT) of fleet vehicles can save fuel, reduce maintenance expenditures and limit environmental impacts. VMT may be reduced by consolidating the routes of service vehicles to eliminate duplication of trips. Service vehicle scheduling and routing may be optimized. Carpooling or use of shuttle services for high-use routes can have a similar effect. Trips may be eliminated via teleconferencing. Incentivizing City employees to utilize transit, where feasible, can reduce the need for fleet vehicles.

### ALTERNATIVE FUELS INFRASTRUCTURE FEASIBILITY ASSESSMENT

New sources of domestic natural gas have led to wider availability of CNG and propane Autogas. Meanwhile, the auto industry continues to rapidly innovate in the area of EVs. The price of these alternative fuels is already competitive with gasoline and diesel. Despite the promise of clean fuels, new – and sometimes costly – infrastructure is required to support alternative fuel vehicles.

The City will study options for developing the infrastructure required to support demand for clean fuels, including CNG, propane Autogas and electricity.





## Action

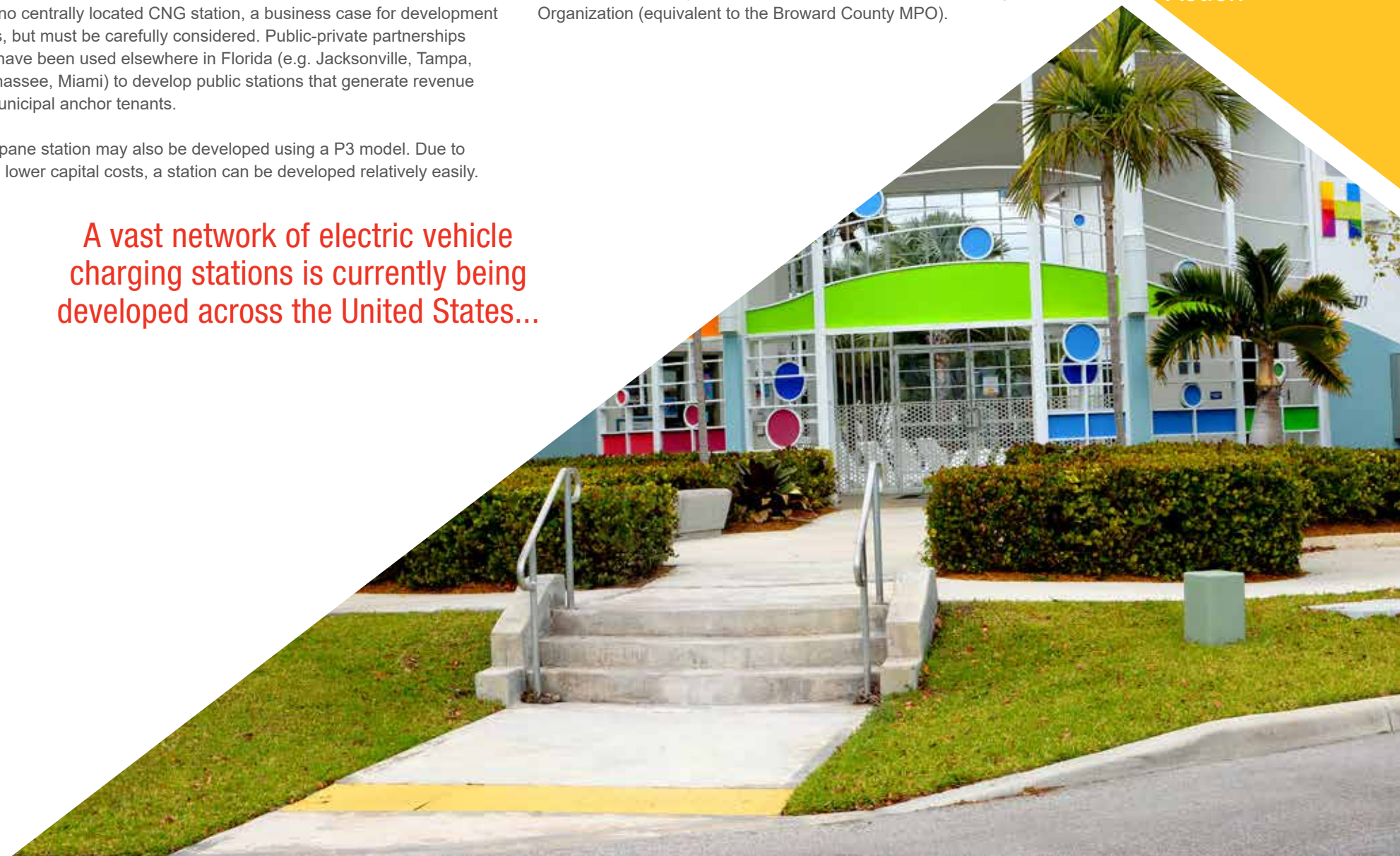
Most pressing is the need for CNG infrastructure. The City maintains a fleet of eight CNG refuse trucks. Initially, these trucks were fueled at the nearby City of Hollywood Fuel Station. However, this station closed in 2016, due to the expense of upgrading aged equipment. This forced the City to fuel these vehicles in distant Pompano Beach at a higher cost per gaseous-gallon equivalent. As a result, the business case for CNG has changed for the worse.

With no centrally located CNG station, a business case for development exists, but must be carefully considered. Public-private partnerships (P3) have been used elsewhere in Florida (e.g. Jacksonville, Tampa, Tallahassee, Miami) to develop public stations that generate revenue for municipal anchor tenants.

A propane station may also be developed using a P3 model. Due to much lower capital costs, a station can be developed relatively easily.

**A vast network of electric vehicle charging stations is currently being developed across the United States...**

A vast network of EV charging stations is currently being developed across the United States, accelerated by the Federal Government's settlement with Volkswagen, in the wake of its diesel vehicle scandal. As a result of the settlement, millions of dollars will be invested via FDEP and Electrify America in South Florida's EV infrastructure. This can be supplemented with programming Congestion Mitigation and Air Quality (CMAQ) funds for EVSE on public property, as has been done by the North Florida Transportation Planning Organization (equivalent to the Broward County MPO).







## Action

# MATERIALS MINIMIZATION & RECYCLING

Diverting the City's waste from landfills through strategies such as source reduction, reuse and recycling avoids harmful pollution and reduces transportation emissions. It also saves money and has the potential to generate revenue.

The City provides garbage, bulk waste, yard waste collection and recycling services to 4,728 residential single family accounts on a weekly basis. The City also provides garbage collection for 707 multifamily residences and 647 commercial accounts and recycling collection services for approximately 43 multifamily residences and five commercial accounts. Other commercial accounts are serviced by private contractors<sup>2</sup>. There is currently no composting program for the City. The City does not own or operate any landfills. Presently, 100% of residents' garbage is transported by City trucks to the Waste Connections transfer station in Pembroke Pines and then trucked to an Orlando-area for landfill disposal. Bulk/yard waste is transported to the Monarch Hill Renewable Energy Park, where bulk recyclable materials are diverted from the waste stream and yard waste is used to generate methane for a renewable energy plant.

The City tracks revenue and expenses separately for the different account types (single-family residential, multifamily residential and commercial), but currently does not track waste disposal or recycling tonnages separately for these account types. For garbage collection, 83% of accounts are single-family, 10% are multifamily, and seven percent are commercial. It is reasonable to assume that the bulk of garbage collected is residential, however, it is not possible to disaggregate tonnages by account type based on available data. The term "community-wide" includes all three waste types.

Beginning with the City's own municipal operations, the City intends to stop waste before it happens, reducing waste generation sources by five percent by 2022. The City will seek to espouse the principles of Sustainable Materials Management (SMM). SMM systematically uses and reuses materials more productively over their life cycles. Looking at a product's life cycle, the City can identify opportunities to reduce environmental impacts, conserve resources and reduce costs.

Continuing beyond the City's sanitation services to our solid waste collection program, the City should aspire to divert 30% of materials from the landfill through recycling and composting by 2022. Over the long term, the goal is to divert 75% of both community-wide materials and materials from city operations by 2040. A barrier to this goal is that many of the City's multifamily buildings were constructed without the on-site space necessary to achieve a high level of recycling.



<sup>2</sup> In FY16/17, permitted waste haulers included: Bicon, Inc., Lopefra Corp., Medley Metal Recycling, Panzarella Waste & Recycling Services, Republic Services, Inc., Sunshine Recycling Services, Tropical Sanitation, Waste Connections, Waste Management, Waste Pro, and World Waste Recycling.

## INCREASE COMMUNITY-WIDE RECYCLING

- NPV: \$1,066,000
- ROI: 54%
- Contribution to Goal: 100%
- Lead Department/Division: Public Works
- Responsibility: Sanitation Superintendent, Public Works Director and Recycling Coordinator

## GREEN PURCHASING PROGRAM

- NPV: \$12,000
- ROI: ∞\*
- Contribution to Goal: 1.1%
- Lead Department/Division: Procurement
- Responsibility: Procurement Director

## COMPOSTING FEASIBILITY ASSESSMENT

- NPV: -\$49,000
- ROI: -100%
- Contribution to Goal: To be determined
- Lead Department/Division: Public Works
- Responsibility: Green Initiatives Coordinator

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞



# PROJECTS

Three potential projects to boost recycling rates and better manage the City's materials are under consideration, including Increase Community-wide recycling, Green Purchasing Program and Composting. While these projects come at a cost, potential implementation will help meet the 30% diversion goal by 2022. The projects will also provide a substantial financial incentive to continue expansion of and participation in the City's recycling and reuse initiatives.

The City is investigating monetizing (privatizing) of commercial and multifamily sanitation services. The intent is to improve the Sanitation Division's financial performance. However, careful analysis of this proposal is needed given the potential for realization of substantial recycling revenues and waste disposal cost avoidance if the City's diversion rates are improved. This should include tracking for these material types separately from single-family generation.

## INCREASE COMMUNITY-WIDE RECYCLING

On a per capita basis, Hallandale Beach residents generate about 2.8 tons of municipal solid waste per year, amounting to more than 25,000 tons community-wide<sup>4</sup>. The costs of collection, transportation and disposal at an Orlando-area landfill make managing this waste expensive for the City. Currently, Hallandale Beach is paying unnecessary tipping fees and foregoing potential revenue by trucking valuable recyclable commodities hundreds of miles for landfill disposal.



The community-wide recycling rate of five percent is far below the national average of ~34% and the 75% diversion target established by the State of Florida (Florida Statutes 403.7032). This low rate translates to substantial potential savings. The City is able to earn \$28 per ton in recycling revenue through an agreement with Waste Connections (formerly Progressive Waste Solutions of Florida). This agreement is effective through December 31, 2018 and will automatically renew for three successive five year periods, provided that neither party has provided the other party with written notice of its intent not to renew the term. The City's recycling is currently transported to the Waste Connections materials recovery facility in Pembroke Pines. Together, with \$48 per ton tipping fees, this means every ton of waste recycled instead of landfilled represents a \$76/ton benefit to the City.

By significantly increasing community-wide recycling, the City can simultaneously save money on waste disposal costs and realize substantial returns from the sale of recyclable materials. Increasing MSW diversion just five percent each year over 10 years will allow the City to realize \$2.4 million in net present value, with a 189% ROI after all expenditures. These economic returns will be important for funding other projects in the City's sustainability program which may have extensive benefits, but smaller financial rewards.

## MATERIALS MINIMIZATION & RECYCLING

The City has great potential to improve diversion rates. In FY15/16, Hallandale Beach generated 25,455 tons of MSW, 1,323 tons of recyclable materials and 4,476 tons of yard waste. The community-wide MSW generation rate was nine percent above the national average<sup>3</sup>, while the community-wide diversion rate, including recycling and diversion of bulk/yard waste, was 19.4%, significantly lower than the national recycling rate of 34.6%. The community-wide recycling-only diversion rate, excluding bulk/yard waste, is even lower, close to five percent. These low rates leave ample room for improvements, with the potential for the City to earn substantial recycling revenues as the diversion rate increases. The City earns a rebate for recyclables of \$28 per ton, amounting to approximately \$37,000 in 2016, while it pays \$48/ton to dispose of MSW, amounting to approximately \$1,218,000 in FY16.



### Action





## Action

# Save < Money



Monetizing commercial and multi-family collection would eliminate the City's ability to generate recycling revenue from these properties, leaving the financial benefits to be partially captured by private waste haulers. Monetizing these waste streams would reduce the benefits of this project by an estimated 25%. However, funds could be allocated from continuing franchise fee revenue to maintain the materials diversion process.

Achieving projected savings will require a combination of assessment, planning, infrastructure improvements, community outreach and stability in the value of recyclable materials. Some of the necessary steps include:

- Tracking materials collection by account type (single-family, multifamily, and commercial)
- Conducting waste audits to better understand the materials stream
- Hiring two staffers who are dedicated to overseeing sustainability projects and increasing the City's recycling rate
- Procuring new, consistently branded, residential recycling bins citywide
- Ensuring all public spaces have recycling bins accompanying waste bins
- Provide financial incentives and technical assistance to bolster recycling in older multi-family buildings
- Conducting education and outreach to boost recycling among the City's single family residents
- Creating partnerships to expand advocacy of recycling
- Sending a multi-language recycling guide to every Hallandale Beach resident
- Offering a large number of workshops to community organizations
- Implementing an incentive program for residents (ex: Third party vendors fit recycling bins with a GPS tracker or chip and recycling is weighed as it is collected. Residents receive reward points, which can be redeemed for discounts and gift cards, based upon the amount that they recycle.)
- Conduct periodic training and retraining for City sanitation staff to ensure best practices are the norm

Increasing the City's community-wide diversion rate will have substantial environmental and social benefits. These include reductions in fuel use, GHG emissions, and air pollutants from handling, transporting and landfilling waste.

Community outreach is an integral component of this project. Due to the fact that everyone generates waste in their home and business, efforts to promote recycling will become one of the most visible aspects of the City's sustainability efforts. The program will allow the City to be seen as a regional leader that "walks the walk and talks the talk" on sustainability. There is the potential that increased commitment will lead to an increase in green jobs in businesses supporting recycling and reuse.





## Action

After the 10 year project life, the City's MSW diversion rate should stand at 30%, leaving ample room for future improvements and costs savings. Other Florida Cities have set ambitious waste diversion goals. Orlando has a goal of 50% waste diversion by the end of 2018, and zero waste by 2040, building on its 2010 baseline rate of 27%. In 2017, Orange County reported a 72% diversion rate as accounted by FDEP. As one way to meet these targets, the City is discussing a recycling requirement for owners of multi-unit residential and commercial buildings. In Florida, Collier, Lee and Miami-Dade counties well as the City of Gainesville all require mandatory recycling for commercial and/or multifamily properties. Orlando also cut weekly garbage collection days in half while doubling recycling pickups for residents with the expectation of realizing cost savings from reduced waste-handling. The City should analyze incentives to achieve the waste stream reduction goal attainment and only use mandates as a last resort.

Although not modeled as part of this initiative, additional actions, such as implementing a Styrofoam and/or plastic bag prohibition, would reduce Hallandale Beach's waste disposal costs, reduce litter and prevent environmental contamination in the community. The City is currently studying the feasibility of implementing an internal policy that would eliminate the purchase of Expanded Polystyrene (more commonly known as Styrofoam) with City funds or by contractors paid with City funds. The legal issues surrounding the plastic bag ban in Coral Gables are also being monitored. As the legal issues resolve, the City should consider following the leadership of Coral Gables.

### GREEN PURCHASING PROGRAM

Green purchasing is a key component of a sustainability program. Source reduction through green purchasing has the greatest impact on waste minimization efforts, and should be prioritized above other source reduction efforts. In addition, green purchasing allows Hallandale Beach to choose products that are less toxic, less resource and energy-intensive, locally sourced or fairly traded<sup>5</sup>, among other potential environmental and social benefits. Often, such products are available at little to no incremental cost. By prioritizing bulk buying and information technology products that save energy, green procurement programs can result in net savings to the City. By establishing a green purchasing policy for its internal operations, the City can set an example for the community.





Although there are many environmental benefits associated with green purchasing, economic benefits come mostly from reduced energy consumption. Information technology (IT) equipment – from computers and monitors to network devices and servers – are more integral to the City's daily business than ever. As technology improves, so do opportunities for more efficient use. The City's IT department has already begun to reduce the energy demand of the City's equipment by using equipment power management features and virtualizing servers (i.e. by storing data over the internet), among other measures.

This project involves establishing a plan to ensure that 100% of qualifying IT equipment meets the ENERGY STAR® standard (or equivalent) for energy efficiency. In addition, the City will preferentially purchase consumables, durable goods and cleaning products and materials that will enhance ecological benefits, promote the health and safety of staff and citizens and reduce operating expenses. The project is a minimal cost measure. It will require staff time to develop and roll out the green purchasing policy and educate City employees, but with very little additional capital investment. Legacy electronics (computers, laptops, monitors, etc.) will be replaced with ENERGY STAR® equivalents at no incremental cost because ENERGY STAR® labeled products typically do not cost more than those without the label.

### COMPOSTING FEASIBILITY ASSESSMENT

Higher rates of materials diversion (>30%) may require removing biodegradable material from the City's materials stream through a composting program. This could lead to additional savings from avoided tipping/disposal fees. Implementing a 50% single family residential diversion rate within an additional five years after achieving the 30% goal detailed in the project above would require the development of a composting facility. Such a facility would be regional in scale and would likely be developed via a public-private partnership or a local government cooperative. Although most cities do not generate revenue from composting programs, the City of Austin, Texas realizes revenue from the sale of "Dillo Dirt," an EPA-approved composted blend of yard waste and biosolids. More study is needed to evaluate the economic benefits of setting up a composting program for Hallandale Beach.

To evaluate potential benefits and cost savings of diverting compostable waste through a municipal program, as well as, the potential costs of implementing such a program, the City will complete a Composting Feasibility Assessment. This study will evaluate various options for program implementation (i.e. public-private partnership, cost sharing

agreement with nearby local governments or contracting with a composting service provider) to determine costs and benefits to the City.

The City may need to develop a request for proposal (RFP), secure funding, accept proposals and implement the study if this analysis cannot be completed in house. The costs of conducting the study are estimated to be approximately \$49,000. Benefits will include a clear understanding of various options for implementing composting in the City and their financial implications. Financial benefits are not yet estimated as they will depend on the details of selecting and implementing a composting program.



### FUTURE STEPS

As the City moves forward to prevent pollution, minimize waste and boost recycling and composting, several strategies can be developed to reach its goals.

#### REGULATE USE OF STYROFOAM AND SINGLE-USE PLASTIC BAGS

Expanded polystyrene (EPS), also known as Styrofoam, is a petroleum based material that is not recyclable or biodegradable. EPS breaks up into small pieces and poses a threat to wildlife, which may inadvertently ingest it. Like single-use plastic bags, it also has become a source of litter in many urban environments, including Hallandale Beach. A ban on the use of polystyrene containers and/or plastic bags in the City could reduce litter, benefit the environment and reduce waste generation.

In 2017, the City of Coral Gables prohibited the use of expanded polystyrene by City vendors, contractors in City facilities, special event permittees and their subcontractors, and food service providers and stores. Coral Gable's ordinance was challenged by an industry lawsuit, but has been upheld pending appeal.



Action

PLANET

OCEAN



## Action

In May 2017, Coral Gables also became the first Florida city to impose a partial ban on single use plastic bags. The city ordinance, designed to promote reusable or paper bags, fines retailers who use single-use plastic bags between, with exceptions for plastic bags used for dry cleaning, medications, newspapers and pet waste. However, the ban may be challenged in court because the Florida Legislature blocked local governments from banning plastic bags in 2008. To date, about 40 Florida cities have passed resolutions asking the state to grant them the right to regulate plastic bags in their jurisdictions. Pending court decisions, Hallandale Beach may wish to consider prohibiting EPs and/or plastic bag items to reduce waste and litter in the community.

and reveals common waste practices. Characterizing waste uncovers opportunities to improve waste diversion rates, increase recycling, reduce greenhouse gas emissions and lower disposal costs. A waste audit report prepared for Palo Alto in 2012 found that 70% of the city's waste stream could potentially be diverted through either recycling or composting. Performing a waste audit is an essential first step to identifying markets for recyclables and realizing cost avoidance associated with waste diversion. The City will procure a waste audit as an initial step to increasing our community-wide diversion rate through project Increase Community-wide Waste Diversion.

### PERFORM A WASTE CHARACTERIZATION STUDY

A waste audit, also known as a waste characterization study, identifies and quantifies the various materials in an organization's waste stream

To date, about 40 Florida cities have passed resolutions asking the state to grant them the right to regulate plastic bags in their jurisdictions.



City of Hallandale Beach  
Municipal Complex  
400 South Federal Highway





## Action

## LAND USE & TRANSPORTATION

Hallandale Beach (incorporated in 1927) is one of the oldest cities in South Florida, tracing its roots to the turn of the 20th century. Since that time, it has grown to a modern, compact city. The City's high-density nature lends itself to sustainability. In dense urban environments, fewer resources are needed per capita, while multifamily housing, public transportation and destinations within biking or walking distance save energy and fuel, foster cultural connections and promote health.

According to the Citywide Master Plan and Implementation Strategy, the basic urban design of the City remains focused on automobiles rather than pedestrians, it lacks a distinct City center, land uses are separated without linkages to encourage non-vehicular trips, development does not engage the street, population growth has created a demand for additional recreation space and open space/water and access to lakes and canals is limited. The Master Plan recommends that the City create a new town center around a redesigned Bluesten Park and adjacent to a potential future commuter rail station. The Central Regional Activity Center (RAC) zoning district supports this vision. It is comprised of several sub districts, including the Transit Core subdistrict which borders Bluesten Park and intends to create a compact, mixed-use, vibrant, pedestrian friendly area around the planned Tri-rail Coastal Link station and along main transit routes.

The City has also embarked on a multi-year \$58.5 million program to improve existing parks and develop new public facilities. As part of this process, the City broke ground on the redesigned Bluesten Park during October 2017 and it is still discussing the potential to create a new City Center around this space.

Transportation in Hallandale Beach – like most places – is dominated by automobiles and congestion is a major concern for citizens. While efforts are underway to reduce congestion through roadway improvements including signal optimization, the City's future lies in developing alternatives to reduce vehicular trips. About four percent of travelers use mass transit – higher than the Broward County average of little more than one percent – but there is much room for improvement. The City has a free Community Bus that provides local and contiguous municipality connections. The City has adopted VMT reduction targets. The City is also committed to enhancing the Community Bus system and funding bicycle and pedestrian improvements.

The City implements a vision for future land uses and redevelopment through a Comprehensive Plan and a code of ordinances, including a zoning and land development codes and the 2008 Commission adopted Master Plan. Several sustainability policies are included in these tools, including promotion of compact, mixed-use development, protection of beach dunes, restoration of native coastal vegetation and the establishment of climate change Adaptation Action Areas (AAAs) within the City.

Green building is an integrated process of infrastructure planning, design, construction and operations that is economical, socially and environmentally responsible throughout a building's life cycle.

### BIKESHARE

- NPV: \$0
- ROI:  $\infty^*$
- Contribution to Goal: To be determined
- Lead Department/Division: Development Services
- Responsibility: Transportation and Transit Planner

### GREEN PURCHASING PROGRAM

- NPV: \$12,000
- ROI:  $\infty^*$
- Contribution to Goal: 1.1%
- Lead Department/Division: Procurement
- Responsibility: Procurement Director

### BUILD-OUT BICYCLE AND PEDESTRIAN NETWORK

- NPV: -\$660,000
- ROI: -100%
- Contribution to Goal: To be determined
- Lead Department/Division: Development Services
- Responsibility: Transportation and Transit Planner

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol:  $\infty$





# PROJECTS

## BIKESHARE

Bikeshare programs provide greater access to bicycles for residents and visitors, facilitating trips without a car. The county's bikeshare program has installed a station at North City Beach Park. However, a City-wide bikeshare program does not currently exist.

Traditional bikeshare programs, such as the county's, involve dedicating sites and building expensive infrastructure to dock bicycles and are oftentimes geared toward tourists. New, dockless, approaches to bikeshare solve this problem by using a mobile app to electronically lock/unlock bicycles tagged with a GPS. Bicycles can be accessed anywhere in the City. Dockless bikeshare programs are run by third-party, for-profit entities, such as Limebike, Ofo and Mobike and require no investment from the City other than regulating and monitoring the license agreements under which they operate.

Dockless bikeshare programs originated in China's largest cities, where 70 dockless bikeshare companies operate over 16 million bikes. In two of these cities, Beijing and Shanghai, the number of car trips under five miles has fallen for the first time according to the Institute for Transportation and Development policy, a trend that corresponds with the introduction of dockless bikesharing. Dockless bikeshare programs have since moved forward in Dallas, Miami, Seattle, San Francisco and Washington, D.C.



To be successful, thoughtful permitting and regulatory processes to guide vendors and users must be established. Staff is currently meeting with providers and researching best practices to establish policies and a selection process is underway. They will closely monitor system performance (e.g. travel miles, miles per hour, routes, pick up and drop off locations, rental duration and ridership to refine the City's regulatory approach.

The benefits of this no-cost project include wider access to bicycle transportation, reduced congestion, reduced pollution and improved health for riders. These benefits are vitally important to the City's future, but difficult to quantify. Over time, the data collected through the system will permit better estimation of benefits.

## BUILD OUT BICYCLE AND PEDESTRIAN INFRASTRUCTURE

Bicycling and walking are common throughout Hallandale Beach, thanks to a functional but incomplete network of infrastructure. Completing this network will provide alternatives to automobile travel, better connect neighborhoods, improve safety and enhance the aesthetics and quality of life in the City.

## LAND USE & TRANSPORTATION

Projects requiring green building certification in Hallandale Beach are as follows:

1. New commercial buildings or major renovation projects greater than 50,000 gross square feet
2. New residential/hotel buildings or major renovation projects of 50 units or greater, any commercial residential or mixed-use project requiring the allocation of flexibility or reserve units
3. Any new City owned and operated building construction projects
4. Any new major or minor development projects requesting financial assistance from the Community Redevelopment Agency

Certification is required through a recognized third-party, such as U.S. Green Building Council (LEED) or Green Building Initiatives (Green Globes). These projects receive expedited permitting review and approval and developers have access to training workshops. Four buildings in the City have achieved green building certification. Three are City facilities (OB Johnson Park, Foster Park and BF James Park). LEED certification is pending for the newly constructed Fire Station 7. A non-municipal project, The Village at Gulfstream Park, is currently undergoing certification.

The SAP has established goals that build off success with green building and transportation alternatives.

The City's goal is to increase the percentage of the bicycle/pedestrian network that is level of service B or better by 10% annually until 2022. This means bicycle and pedestrian friendly sidewalks and intersections and dedicated infrastructure with low levels of interaction with motor vehicles.



Action





## Action

### LAND USE & TRANSPORTATION

The City will also establish more targeted green building standards for new public, commercial and multifamily buildings and infrastructure by 2022. These targeted green building standards will build upon the City's current standards and will be used to ensure that buildings meet targets set forth by the City. This new code will select certain credits that already exist in third-party rating systems and will potentially develop new credit areas of its own in order to create a condensed suite of credits targeted specifically to achieving goals that the City sets forth. For instance, if the new green building code sets a focus area pertaining to stormwater management the code would work to incentivize features such as green roofs and low impact development.

By 2040, the City aspires to achieve a balanced transportation system with no single mode having more than 30% of total trips. Hallandale Beach will also establish fiscally responsible sustainability standards for existing buildings and infrastructure so that all eligible structures in the City are as energy efficient as possible.

This SAP identifies two projects that pave the way towards achieving these goals. While the economic benefits of these projects is difficult to quantify, it is clear that fostering more mobility options will reduce pollution, improve health and safety and add vibrancy to City streets. The City is developing a comprehensive Mobility Plan that will be presented to the community at City Commission before the end of FY17/18. This Mobility Plan will be the galvanizing force behind future multimodal projects and is a critical element of achieving the goals laid out in the SAP.

Through this project, the City will develop and adopt Bicycle and Pedestrian Level of Service (LOS) standards. These standards will allow the City to close gaps in bike and pedestrian ("bike/ped") connectivity and prioritize projects identified in the City's 2016 Basis of Design Report (BODR) and Multimodal Mobility Plan under development. This plan preliminarily assigns the City's Bicycle and Pedestrian system a LOS rating of "D," meaning moderate-to-high interactions with motor vehicles that limit bicycling to advanced adult bicyclists and cause safety and comfort issues for pedestrians. Projects can be incorporated into the City's bike/ped master map to develop a work plan for implementing projects. Infrastructure improvements will be complemented by uniform signage and amenities, such as bike racks, shade trees, water features and benches. An education and outreach plan will inform motorists, bicyclists and pedestrians about the improvements to the City's bike/ped network and encourage its use. The project is aimed at moving the City's LOS standard to level "B." This means bicycle and pedestrian friendly sidewalks, intersections and dedicated infrastructure with low levels of interaction with motor vehicles. Specific LOS standards will be developed as part of this project.

Costs include development of detailed LOS standards and implementation of bike lane projects. For illustrative purposes, these costs are derived from the draft 2016 Multimodal Mobility Plan, including new bike lanes along Three Islands Boulevard, Atlantic Shores Boulevard and NE 14th Avenue. Occurring in 2019 through 2022, these costs amount to \$660,000, when accounting for the time value of money, or about \$150,000 per year over four years. Incremental investments in sidewalk improvements outlined in the BODR are assumed to occur outside of the scope of this project. The benefits of reduced vehicle miles and increased bicycle and pedestrian travel are significant, including reduced congestion and pollution, improved quality of life, but are not quantified at present.



### FUTURE STEPS

The form and function of cities is constantly changing. As Hallandale Beach's streets and spaces evolve, new opportunities will arise to foster development and mobility that benefits the economy, citizens and the environment. Some potential directions for future transportation and land use initiatives include:

#### GREEN BUILDING AND OPERATION STANDARDS

The City has adopted voluntary third-party standards for new construction/major renovation of its buildings and certain commercial/multifamily buildings. Standards for civil infrastructure, landscapes or existing buildings have not been adopted.





# Enhance < Communities



## Action



While voluntary third-party standards validate integrated design and construction, they do not consistently lead to outcomes important to the future of Hallandale Beach. The City is rapidly redeveloping. In order to achieve its long term goals, the City will consider enhancing the existing green building program by establishing prescriptive targets consistent with the focus areas of this SAP, such as energy efficiency, water conservation and waste minimization.

For example, consistent with a 2016 study of building energy efficiency in Santa Monica, commercial and multifamily energy performance can be improved by 10% and 15% relative to code (TRC 2016). The California building energy code is very similar to Florida's Building Energy Code in terms of performance. Applied to Hallandale Beach's current commercial/multifamily development activity, prescriptive energy efficiency standards could save eight million kilowatt hours over 10 years (nearly two percent of total community energy consumption), resulting in a \$1.2 million net benefit to residents, after accounting for the cost of additional energy efficiency measures.

This Green Building and Operations Standards project will include an in-depth analysis of an ordinance, modeled after the City of South Miami, which would among other things amend Chapter 8, Article II of the City's Building Code to create definitions, criteria and regulations for solar collectors in the City of Hallandale Beach. The City Commission expressed interest in adopting an ordinance such as this during late 2017. City staff drafted an ordinance, but upon further discussion it was decided that the item would be deferred and further researched as part of this SAP.

With adoption of this SAP, the City will also consider expanding its standards to existing buildings and public infrastructure, such as parks, roads and utilities.

This process requires building a community consensus on the benefits and a time period

that is reasonable for implementation. Adoption of this Plan starts the journey, but does not reach the destination.

The process the City could follow to enhance its green building program includes establishing an interdepartmental team to review the results of the current Green Building Program, researching best management practices, identifying priorities, modeling the costs and benefits of green building techniques necessary to achieve priorities, conducting stakeholder outreach, revising the Green Building Code and receiving approval from the City Commission. One strategy for improving energy use in existing buildings could be providing a subsidized, no cost energy audit to owners that make the investments based on its recommendations. This could be done in partnership with FPL.

### ECO-DISTRICT

The City's 2009 Citywide Master Plan recommends establishing a town center around the redesigned Bluesten Park, the existing government center, the Villages at Gulfstream Park, and a future multimodal transportation station on the FEC corridor. The center will promote pedestrian-oriented, mixed-use, sustainable redevelopment. The City's Regional Activity Center (RAC) zoning was created specifically because of the availability of transit along this corridor. In order to ensure this new center maximizes opportunities to incorporate sustainable features, including a transit facility, the City should consider expanding the goals of the RAC to establishing it as an eco-district.

An eco-district applies sustainability planning principles to the neighborhood or district level, establishing goals and requirements for mobility, energy and water use, materials management, health, habitat and equity, often resulting in a showcase for high-performance redevelopment. Eco-districts often also involve development of key sustainability infrastructure, such as transit centers, reclaimed water for irrigation, on-site capture and storage of storm water, complete streets and other access enhancements, LED street lighting, district cooling, etc.





## Action

Eco-districts also provide the opportunity for a variety of value capture financing methods, such as tax-increment financing, business improvement district financing and infrastructure impact fees, among others, that take advantage of the increased value high-quality, high-performance development provide to the City and its landowners. Eco-district principles have been implemented in the Pearl District in Portland, the Uptown neighborhood of Pittsburgh and the Seaholm District in Austin.

### FORM-BASED CODE EXPANSION

As the City continues to experience intensifying development activity, it has begun applying form-based code approaches to zoning and development regulation. Form-based codes are a zoning framework that regulates the physical form rather than the use of development. By controlling the relationship between buildings and streets, regulating the size and form of buildings and the scale of streets and blocks, form-based codes more directly foster sustainable urban environments, while meeting the expectations of landowners and developers. Currently, the City has developed a form-based code along U.S. 1/Federal Highway. The City is considering expanding form-based codes to the Hallandale Beach Boulevard Corridor expansion. Calibration of this approach can help ensure that future demand for growth is harmonized with needs for mobility and livability.

### ENHANCE COMMUNITY BUS SERVICE

The City's developing Mobility Plan recognizes that opportunities to increase right-of-way for vehicular traffic in the City are substantially constrained. The Mobility Plan includes a suite of recommendations

related to enhancing the Community Bus service. The primary recommendation involves reducing headways to 30 minutes by investing in additional buses, refining routes and adding hours of service. The study estimates a doubling in system funding to achieve this goal. Other recommendations include enhancing the experience of using the system by improving bus stops, implementing technology to track operations, enhancing amenities to connect transit to walking and bicycling facilities and coordinating with the planned Tri-Rail Coastal Link station.

A long term goal could be to create intercept parking garages on A1A, Hallandale Beach Boulevard and Federal Highway (US 1) to keep cars at the outer limits of the City and link the garages with five minute headways for the Community Bus service during peak travel times or special events.





## Action

### DEVELOP A VULNERABILITY / ADAPTATION ASSESSMENT

- NPV: -\$82,000
- ROI: -100%
- Contribution to Goal: 100%
- Lead Department/Division: Public Works
- Responsibility: Green Initiatives Coordinator

### DUNE PROTECTION PLAN

- NPV: \$0
- ROI: ∞\*
- Contribution to Goal: 100%
- Lead Department/Division: Public Works
- Responsibility: Public Works Director

### LOW IMPACT DEVELOPMENT STANDARDS

- NPV: \$0
- ROI: ∞\*
- Contribution to Goal: \*\*
- Lead Department/Division: Development Services
- Responsibility: Development Services Director

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞

\*\*The contribution of this projects to goal cannot be calculated at present but will be calculated as projects and project ideas are further developed.

## NATURAL RESOURCES & RESILIENCE

South Florida coastal communities are uniquely vulnerable to the projected impacts of a changing climate. As documented by the Florida Climate Institute, a multi-discipline network research and scientific organizations, including 10 of the state's public and private universities, rising seas, salt water intrusion, more intense storms and temperature extremes already threaten South Florida and are projected to pose even greater risks in the future (FCI, 2017). However, our region has proven its resilience to environmental challenges in the past and is taking the lead, as exemplified by the Southeast Florida Regional Climate Change Compact (the Compact), in mitigating and adapting to climate change.

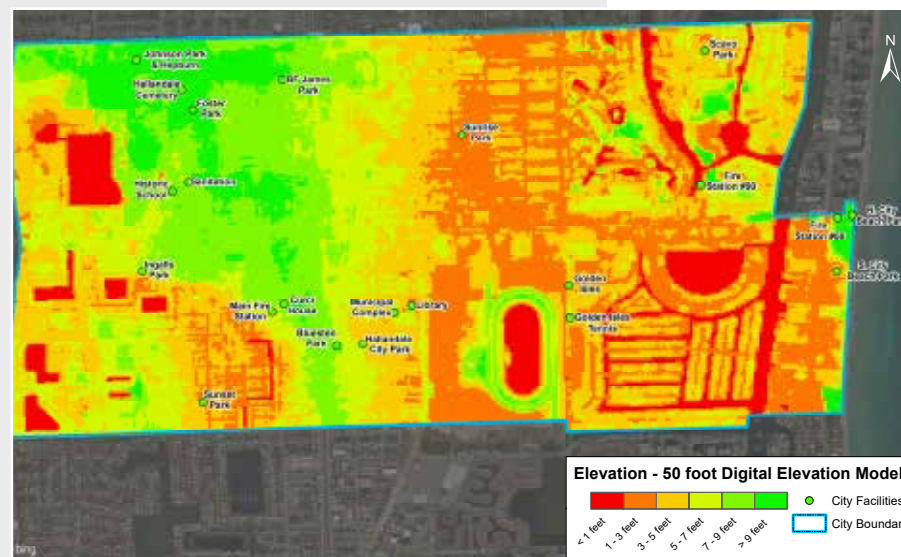
The Compact is partnership among South Florida's four counties to coordinate climate change mitigation and adaptation across the region. A Compact member since 2013, the City of Hallandale Beach is one of 35 South Florida cities cooperatively and proactively managing the risks of a changing climate. By continuing to work collaboratively with regional leaders, Hallandale Beach will make sure the City acts strategically to adapt to changing conditions.

Hallandale Beach's proximity to the Atlantic Ocean and the Intracoastal Waterway comes with a risk of flooding from sea level rise and storm surge. The mean elevation in the City is 5.11 feet above mean sea level (MSL). Approximately 30% of the City is below three feet in elevation, and about 59% is below five feet. The highest areas of the City are predominantly in the northwest quadrant. With the exception of a few areas of higher ground, most of the City east of Highway 1 is low-lying. Figure 3 shows a digital elevation model of Hallandale Beach at 50 foot resolution.

NOAA SLOSH maps indicate Hallandale Beach could experience flooding from a Category 1 or 2 storm. In September 2017, the City experienced a storm surge of one to two feet from Hurricane Irma, then a Category 1 storm. Surge depths were similar to those predicted by the SLOSH model.

A Category 3 or above storm could cause extensive flooding up to three feet above ground level in Hallandale Beach, affecting areas near S. Ocean Drive, Golden Isles, Gulfstream Park and north of Sunset Park. A Category 4 or 5 storm could flood more than 50% of the City's area, with flood depths of six feet or greater in some areas. In the future, SLR may increase the effects of storm surge. Figure 5 shows predicted SLOSH Model inundation from a Category 3 hurricane impacting Hallandale Beach, based on current sea levels.

FIGURE 3: CITY OF HALLANDALE BEACH ELEVATION ABOVE SEA LEVEL





# PROJECTS

GHG emissions from the City's energy use, transportation, waste and other activities are contributing to climate change. The City will reduce GHG emissions from its operations through energy, water, materials and fleet projects, and also take policy actions to reduce emissions community-wide.

In addition to mitigating its contributions to climate change, the City should also move to understand and adapt to some of the unavoidable consequences of climate change, such as flooding, intensifying storms, extreme precipitation and sea level rise. This includes identifying vulnerable areas and populations so the City can help mitigate the impacts. By identifying risks, improving infrastructure and educating citizens the City will ensure that it is adequately prepared. The City should also act to protect and enhance the natural systems that support a high quality of life in our community, now and into the future. The City also recognizes the need to project future impacts of climate change on the various geographic areas of the City and socio-economic groups of the community so that tailored policies may be created to help protect its most vulnerable members. The project below, including Develop a Vulnerability/Adaptation Assessment, Dune Protection Plan and Low Impact Development Standards, further expands on these concepts.

## DEVELOP A VULNERABILITY/ADAPTATION ASSESSMENT

In order to thrive in the future, the City must understand its vulnerabilities to climate change and choose strategic and fiscally achievable options to mitigate and adapt to changing conditions.

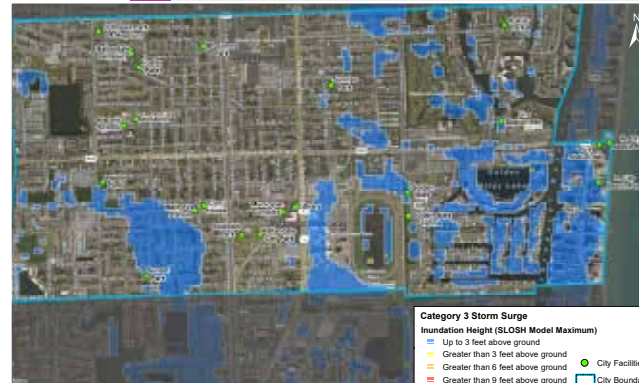
A Vulnerability and Adaptation Assessment will identify risks to City buildings, infrastructure, habitats and connections to vital services and resources such as storm shelters, transportation networks, schools, hospitals, landfills, utilities and groundwater. The Assessment will be based on data-driven heat, storm, precipitation and flood elevation scenarios modeled on predicted future conditions. It will also identify organizational risks to stakeholders, historically vulnerable areas and vulnerable populations, helping the City understand how demographics may shift as a result of sea level rise and other climate related factors.

Risks will be analyzed and prioritized based on probability, cost, spatial extent and time horizon. Best practices from other coastal South Florida communities will be compiled and evaluated for applicability to the City. Through a planning effort, potential adaptation and mitigation measures will be identified and screened via criteria including feasibility and cost, as well as social and environmental factors. These measures will be developed as projects to allow the City to adapt and mitigate risk.



## NATURAL RESOURCES & RESILIENCE

FIGURE 4: SLOSH MODEL INUNDATION, CATEGORY 3 HURRICANE



The 2013 City of Hallandale Beach Vulnerability to Sea Level Rise Assessment Report identified major municipal infrastructure at risk of inundation under one and two foot Sea Level Rise (SLR) scenarios. Under a one foot of SLR scenario, the report found minor impacts to vulnerable infrastructure including to arterial roads around the municipal center/police station and limited flooding of approximately five acres or less throughout the City. Under a two foot SLR scenario, the report found up to 72 acres could be inundated throughout the city. Inundated streets could limit access to city hall and the Police department. Two City parks, and Fire Station 60 (located at 2801 East Hallandale Beach Boulevard) would also have limited access and/or flooding under this scenario. The Hallandale Beach Community Redevelopment Area (CRA) includes areas with elevations at or below sea level during both the one and two foot scenarios. In addition, bridge clearance would be affected under both scenarios.

It is important to realize these findings are based on SLR alone and do not factor in flooding which could occur from the additive effect of SLR and storm surge during extreme weather events.



Action





## Deliverables from this assessment will include:

- Technical flood hazard mapping documentation and associated summaries of change in flood area and frequency for multiple types of flooding
- GIS data containing flood elevation surfaces, flood extents, flood depth grids and base topography
- GIS layers of assets attributed with flood vulnerability under multiple conditions as well as summary tables and discussion of vulnerabilities, highlighting key at risk assets
- Categorization of City facilities/infrastructure in terms of future risk, including a cost/benefit analyses
- Direct and indirect economic loss outputs for existing and future conditions
- Estimated change in shoreline recession rate, including assessment of potential impacts to recreation and nourishment intervals
- Discussion of social vulnerability and analysis of possible gentrification and demographic shifts related to vulnerability
- Discussion of community input and prioritization
- List of short and long-term implementation strategies

The resulting plan will help the City manage resources and prioritize investments to optimize operational continuity and minimize future risk. It will also help the City communicate risk and adaptation measures to the public. Development of the assessment will include public input through at least two community workshops.

Costs to develop the Vulnerability/Adaptation Assessment are estimated at \$86,000. This cost includes a unique community capacity building element. In February 2018, the City applied for a Resilient Coastline Program Grant from the Florida Department of Environmental Protection to fund this project. A decision regarding funding is expected in early 2018.

Direct economic benefits are not estimated as they will depend on the specific recommendations to be developed and require implementation of the resulting projects. However, adaptation and flood hazard mitigation in coastal Louisiana has shown a savings of \$4 of disaster recovery costs for every 1 dollar spent on elevation and flood-proofing. Important to this analysis is that the \$4 savings repeats in future disasters depending on the severity. It is not a one time savings. Completing the assessment will also help lower the City's CRS rating score, reducing the flood insurance premiums paid by residents through the National Flood Insurance Program (NFIP.)

## NATURAL RESOURCES & RESILIENCE

The City does not currently track renovation of public facilities to improve resiliency. In the future, the City plans will take the Unified Sea Level Rise Projection into account when upgrading sewage pump stations. The City's CP, Land Use Element, Objective 2.2 states, "The City shall direct populations away from High-Hazard Areas (HHAs) in concert with the established hazard mitigation strategies developed by Broward County. These areas correspond to Zone VE on FEMA's Federal Flood Insurance Rate Map (FIRM). Zone VE is defined as an area inundated by flood with a one percent annual chance of occurring and with a velocity hazard due to wave action. In Hallandale Beach, Zone VE areas are located along the coast east of S. Ocean Drive/A1A. The City requires minimum elevations for the first floor of new construction sites to exceed the 100-year still-water and wave-action base flood elevations shown in the FIRM for the City.

The City's Comprehensive Emergency Operations Plan (CEOP) governs the City's response to a hurricane or other disaster. The CEOP, which has recently undergone a major update, indicates areas east of the Intracoastal Waterway are vulnerable to storm surges during all hurricanes and should be evacuated. Areas east of Federal Highway should be evacuated in Category 3 or higher storms.



## Action





# Develop < Plan



Action

## DUNE PROTECTION PLAN

The City's beaches provide recreational opportunities for residents and are an important draw for tourism. The dune system that supports them up is the City's first line of defense against storms, sea level rise and beach erosion. It is important that the City's primary coastal dunes are protected and restored so that the dunes will function to protect the beaches and preserve the many benefits they provide.

The City, in conjunction with Broward County, the State of Florida and the Federal Government, must improve resiliency of its dune system by creating a comprehensive Dune Protection Plan that will be included in future updates to the City's Comprehensive Plan. **The Dune Protection Plan should include:**

- Restore and expand the existing dune system
- Prevent dune loss and beach erosion
- Create a long term maintenance plan for the dune system
- Remove invasive species from public and private beach areas
- Engage coastal property owners to improve the dune system
- Increase public education and awareness of the importance of dune restoration and maintenance
- Identify funding for on-going beach renourishment and dune restoration projects
- Plan for the impacts of sea level rise

Developing the Dune Protection Plan (DPP) will involve evaluating best management practices from nearby beach communities, partnering with relevant organizations, developing an outreach and education strategy and holding community workshops to engage residents and businesses. Among other aspects, the DPP will address the design of the dune system, effective erosion control measures, recommended dune

vegetation and planting guidelines, impacts to wildlife, an implementation plan and a budget for improving the dune system. As the plan will be developed in-house by City staff, no additional or incremental costs are estimated for this measure. While difficult to quantify in dollars, benefits include protection of private property, infrastructure, commerce and natural resources.

The DPP will supplement the City's beach renourishment project. The City has been in communication with Broward County and the County estimates that the City's share of the re-nourishment will cost between \$2.3 million - \$3.12 million. The City has a sizable portion of this expenditure budgeted.

## LOW IMPACT DEVELOPMENT STANDARDS

Low Impact Development (LID) takes advantage of all opportunities to maximize green space and promote natural storm water management through the use of plants and permeable materials. In more common terms, LID seeks to use more plants and fewer pipes, where feasible. These methods reduce pollution and improve the health of local waterways. This project helps to fulfill the vision shared by community members during the community workshops. Two of the top three suggested projects include improving water quality in the City and investing in green infrastructure to better manage stormwater. Proposed amendments to the City's Comprehensive Plan (New Policy 2.2.5 in the Coastal Management Element) also stipulate that the City shall incorporate LID into all new public projects within FEMA flood zones and the Coastal High Hazard Area.

Examples of LID practices include the use of bio-retention facilities, rain gardens, vegetated rooftops, rain barrels and permeable pavements. Benefits of LID include storm water management, more aesthetically pleasing green spaces as well as improved water quality and reduced pollution.





## Action

To capture these benefits, the City will incentivize or require LID strategies using municipal code. City staff will research LID best practices to determine those most desirable and applicable in Hallandale Beach. Based on their recommendations, LID definitions and standards may be developed for City properties and right-of-ways or incorporated into development regulations, if warranted. No incremental costs other than staff time are expected for this project. The EPA report, "Reducing Stormwater Costs through Low Impact Development (LID) Strategies and Practices," found that of 17 LID case studies analyzed, total capital costs associated with LID designs were 15% to 80% less than those for conventional development. Direct cost benefits are only part of the picture since LID typically results in ancillary benefits including better aesthetics, increased recreational opportunities, reduced stormwater runoff, decreased pollutant loads and reduced risk of sewer overflows. The flood abatement benefits have the potential to improve the City's Community Rating System (CRS) score (See "Next Steps" below), which could potentially reduce flood insurance premiums for residents and businesses.

## FUTURE STEPS

As the City continues to successfully manage its natural resources and plans for the effects of climate change, opportunities will arise to build on accomplishments. Most of these incremental opportunities will have substantial value because the expanded programs will allow community members to maintain and enhance their lifestyles into the future. Others will lead to direct financial benefits to our citizens from measurable cost savings.

### IMPROVE CRS CLASSIFICATION

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is an incentive program that gives participating communities discounts on flood insurance premiums when they take actions to reduce flood risks. The CRS has three goals:

- To reduce flood damage to insurable property
- To strengthen and support the insurance aspects of the NFIP
- To encourage a comprehensive approach to floodplain management

Under the program, lower CRS classes reflect less risk and are rewarded with higher discounts. Each point decrease in CRS class results in an additional five percent discount in premiums.

The City of Hallandale Beach was the first community in Broward County to secure a Class 6 CRS rating, which provides 20% reduction in rates for properties located within the flood zones and 10% reduction for properties outside the flood zone. Annual savings to residents and businesses were \$1,078,863 in 2014. If the City were able to improve its rating to Class 5, residents and businesses would benefit from a 25% reduction in insurance premiums. The City is already working to improve its CRS classification from Class 6 to a Class 5 rating, which would result in discounts to residents and businesses totaling approximately \$1.2 million per year. The City hired a consultant to help with this process, at a cost of about \$21,700. Additional discounts of approximately \$1.1 million annually would result from improving the score from a Class 5 to a Class 4. Over 10 years, avoided insurance costs could exceed \$12.8 million in net present value if this were achieved.

Improving the City's CRS score will involve hiring a consultant to manage the CRS application process, identifying projects and policies that could result in credit through the CRS system, planning and implementing appropriate projects, collecting supporting information, and submitting an application to the NFIP. To achieve the benefits of improving the CRS score, investments in staff time, consultant fees (estimated at about \$22,000) and planning/implementation costs will be needed. Further study is needed to estimate and validate these costs as part of a capital improvement project identification process that could result in a five year program for enhancing resiliency. Similarly the cost of this project would also be informed by the results of a Vulnerability and Adaptation Assessment.





## MANGROVE RESTORATION

Mangroves are specially adapted trees or shrubs growing in dense thickets in low-lying coastal areas that are flooded at high tide. Prior to development and urbanization, the southeast coast of Florida had many natural areas of mangroves. Mangroves have many important benefits, ranging from aesthetics to wildlife habitat and flood control. They also resist erosion and wave action, helping to stabilize shorelines.

The City of Hallandale Beach has proposed planting mangroves at the corners of the Golden Isles Bridges, along Layne Boulevard south of Church Street, and along the seawall north of the marina on the west side of Three Islands Boulevard. Trails along the shoreline adjacent to the mangrove plantings would allow the public to benefit from the restored natural area with recreational activities such as birdwatching. To implement the project, the City would hire a consultant to perform surveys, advance soil borings and handle design and permitting for the proposed project. There is also a need to work with nearby property owners regarding their concerns on the project.

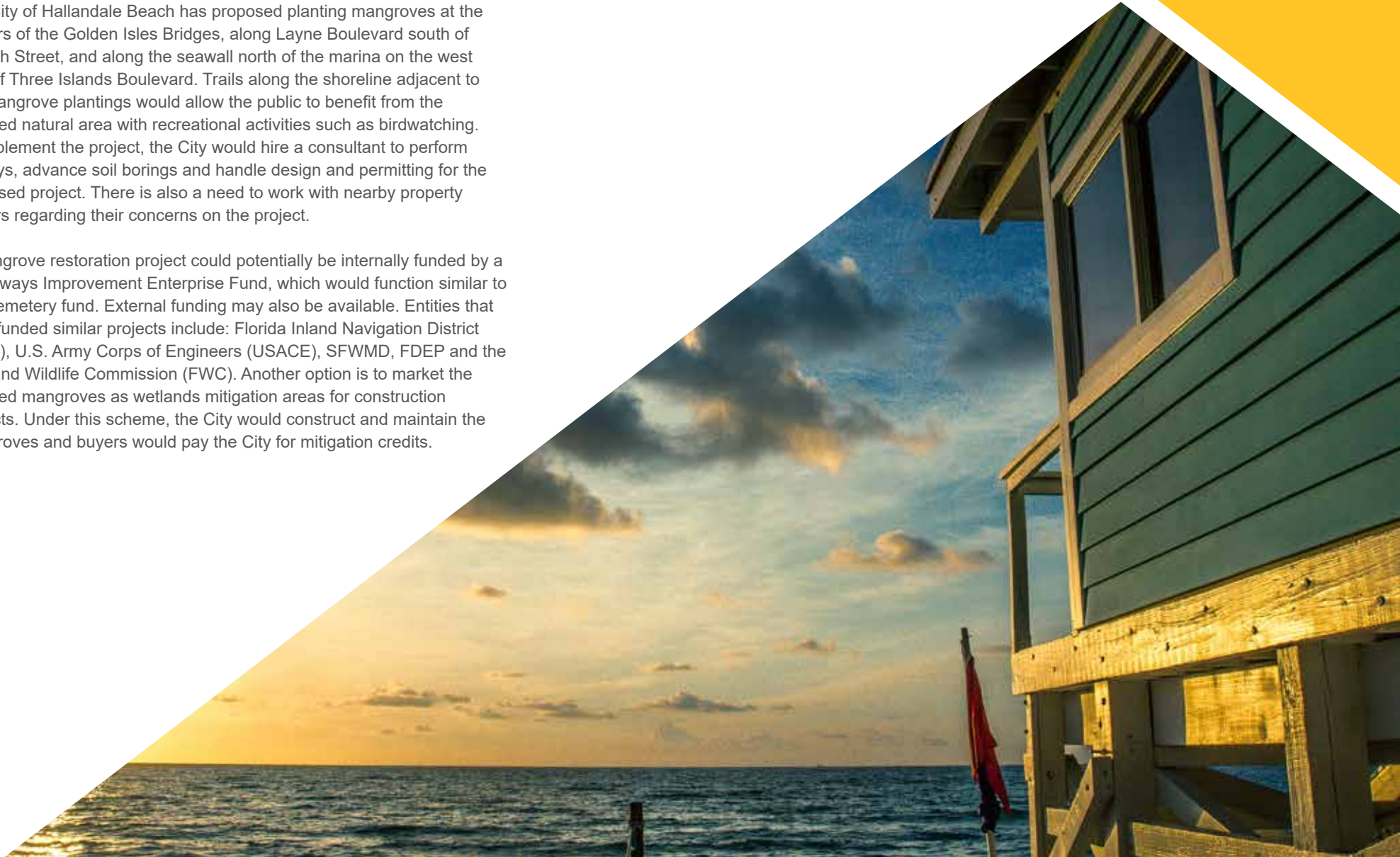
A mangrove restoration project could potentially be internally funded by a Waterways Improvement Enterprise Fund, which would function similar to the Cemetery fund. External funding may also be available. Entities that have funded similar projects include: Florida Inland Navigation District (FIND), U.S. Army Corps of Engineers (USACE), SFWMD, FDEP and the Fish and Wildlife Commission (FWC). Another option is to market the restored mangroves as wetlands mitigation areas for construction projects. Under this scheme, the City would construct and maintain the mangroves and buyers would pay the City for mitigation credits.

## IMPLEMENT ADAPTATION ACTIONS

Once the City has completed a vulnerability and adaptation plan, implementation actions and capital improvements that can significantly reduce risk should be analyzed and programs developed. The results of a Vulnerability and Adaptation Plan, as well as assessment of CRS can inform development of a capital improvement project identification process and a five-year plan for funding and implementing prioritized projects.



Action





## Action

## EDUCATION & OUTREACH

The success of the Sustainability Action Plan depends on the commitment and support of City staff and the people who live, work and play in Hallandale Beach.

Well-developed education and outreach projects will help communicate the challenges the City faces and the value of investing time and money in responding to them. We all share a deep pride in the diversity, resilience and community spirit of Hallandale Beach and it is important for all to realize the role of sustainability and resiliency in preserving these values for future generations.

Hallandale Beach should expand programs to educate and reach both City staff and community members. The City reaches those interested in learning more about its efforts through the Green Initiatives Newsletter and public events like Greenfest. The City website and social media pages also provide an expanding resource for residents to learn about the Green Initiatives. A lofty but achievable goal is that every stakeholder recognizes the word “sustainability” just like all citizens understand the words “traffic” or “parking.” With knowledge comes commitment.



### INTEGRATE SUSTAINABILITY INTO EMPLOYEE TRAINING AND INCREASE EMPLOYEE PARTICIPATION

- NPV: \$2,000
- ROI: 5%
- Contribution to Goal: 100%
- Lead Department / Division: Public Works
- Responsibility: Green Initiatives Coordinator

### COMMUNICATIONS PLAN

- NPV: \$0
- ROI:  $\infty^*$
- Contribution to Goal: 100%
- Lead Department / Division: Public Works
- Responsibility: Green Initiatives Coordinator

### DEVELOP GREEN EVENT POLICIES

- NPV: \$0
- ROI:  $\infty^*$
- Contribution to Goal: \*\*
- Lead Department / Division: Public Works
- Responsibility: Green Initiatives Coordinator

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol:  $\infty$

\*\*The contribution of this projects to goal cannot be calculated at present but will be calculated as projects and project ideas are further developed.



# PROJECTS

Outreach is an ongoing activity that includes all the City's stakeholders. Three projects to further bolster outreach and education have been developed as part of this plan, including: Integrate Sustainability into Employee Training and Increase Employee Participation, Communications Plan and Develop Green Event Policies. All are low- or no-cost, but are expected to have a major impact on the City's culture. Implementing these projects will empower employees to make government more efficient and engage citizens and visitors in Hallandale Beach's sustainability initiatives.

## INTEGRATE SUSTAINABILITY INTO EMPLOYEE TRAINING AND INCREASE EMPLOYEE PARTICIPATION

A sustainable organization is defined by its culture. Currently, the City of Hallandale Beach employees have different levels of experience, expertise and commitment with respect to sustainability. Training for all employees and new hires will develop a common understanding of the City's goals and the actions being taken to achieve these goals. Employees will not only understand how to help implement the City's sustainability vision, but will be empowered to apply their own creativity to identifying solutions.

Training will focus on orienting employees to the City's sustainability vision and communicating its past performance, goals, projects and implementation strategy. It will also emphasize actions employees can take at work and home to save energy, water, and reduce waste. The program could also include incentives to encourage employees to participate in green events in the community.

Staff time would be required to complete this project, along with modest costs of approximately \$3,500 per year for training materials and incentives. Benefits of feedback, education and awareness campaigns have been shown to produce energy savings of up to 10% with comparable benefits in the City's other focus areas. This project assumes just a fraction of such savings (0.2% annually) are achieved from greater employee awareness of the city's resource consumption and adherence to sustainability policies.

## COMMUNICATIONS PLAN

To more effectively engage residents, businesses and other stakeholders in the City's Green Initiatives Program, the City will develop a comprehensive sustainability communications plan that identifies its diverse audiences and the appropriate media and methods to reach them. It will also identify our messaging, goals and strategies. The plan will lay out marketing strategy, responsibility and content used to reach staff, residents,

businesses, vendors, visitors and others, maintaining multiple channels for information dissemination. It will also include provisions for tracking education and outreach efforts to ensure the City's objectives are met.

To develop the plan, the green initiatives coordinator will research best practice case studies from other municipalities and develop an outline for the Plan, coordinating with the IT department, City manager's office and other Departments as necessary. As the Plan will be developed by City staff, no additional costs are estimated for this project. Benefits include more effective use of City outreach funds, improved tracking of results, improved community engagement and greater understanding of the importance of our sustainability projects.

## DEVELOP GREEN EVENT POLICIES

Hallandale Beach hosts 50 to 60 events of all types throughout each year, including events hosted by the parks, police, fire, human service, public works, and procurement departments. The City will develop a Green Events Policy to reduce the environmental impacts of City events and sustainability messaging will be incorporated. This policy will visibly demonstrate the City's commitment to sustainability by reducing waste and GHG emissions, increasing recycling, conserving resources, and encouraging the use of alternate transportation to reach City events.

To develop the Green Events Policy, the green initiative coordinator will research best practices from municipalities, colleges, universities and the private sector. A Green Event Policy outline will be completed in collaboration with the event coordinator. The Policy will be reviewed and refined by the Public Works Director and Parks Director before finalization and approval by the City Manager. City Commission input will be incorporated in the policy.



Action





# Inspire < People



## Action



The policy will focus on eliminating and replacing single-use items used at events such as plastic water bottles and bags, expanded polystyrene (aka Styrofoam), straws, plastic table cloths etc. It will include clear and concise guidelines for eliminating waste and harmful products.

The Green Initiatives and Events Coordinators will create an outreach plan for City staff, residents and vendors. Outreach methods may include email, social media, website and print materials. The coordinators will track the dollars spent on sustainable versus non-sustainable products at events and audit waste and recycling generated at each event. The benefits of using environmentally-preferable products will also be tracked and reported.

This is a no cost initiative requiring only staff time, with no additional costs expected. Event materials identified as harmful will be replaced by alternatives at no net incremental cost. Benefits will include reducing waste, litter and pollution and demonstrating the City's commitment to sustainability to event attendees. The key to success will be incorporating these guidelines in special event permit processing.

## FUTURE STEPS

Outreach is crucial for building a culture of continual sustainability improvement for the City of Hallandale Beach. The City will foster sustainable behavior among stakeholders through commitments, prompts, norms and incentives. Research has shown that when people commit to a particular action, they are more likely to follow through. Prompts are reminders – visual or auditory – to encourage engagement in sustainable behaviors. Norms are unwritten rules that people follow because they are established by the group.

Incentives are rewards for exhibiting sustainable behavior. Some initial areas for communications that foster sustainable behavior as the City takes the next steps include:

### **INSTITUTIONALIZE SUSTAINABILITY MANAGEMENT AMONG STAFF AND CITIZENS**

The City will establish an internal “Green Team” staffed by champions from all of the City's functional areas. Champions are committed individuals who are willing to walk the walk and talk the talk. The Green Initiatives Coordinator will be the “champion in chief” to head up the enthusiastic team. This internal Sustainability Committee will be a formalized outgrowth of the collaboration among staff that has occurred over the course of this planning effort. The Sustainability Committee, orchestrated by the City's green initiatives coordinator, would be tasked with the responsibility of implementing and tracking the Sustainability Action Plan.

The City will impanel a Sustainability Advisory Board to assist in the development of plans and policies to enhance the sustainability of the City as a whole; educate, empower and encourage residents and organizations to become more sustainable; assist in tracking implementation of the SAP and recommend and assist in planning City-wide sustainability events. The board will consist of five regular members and one member under the age of 18 at the time of appointment.

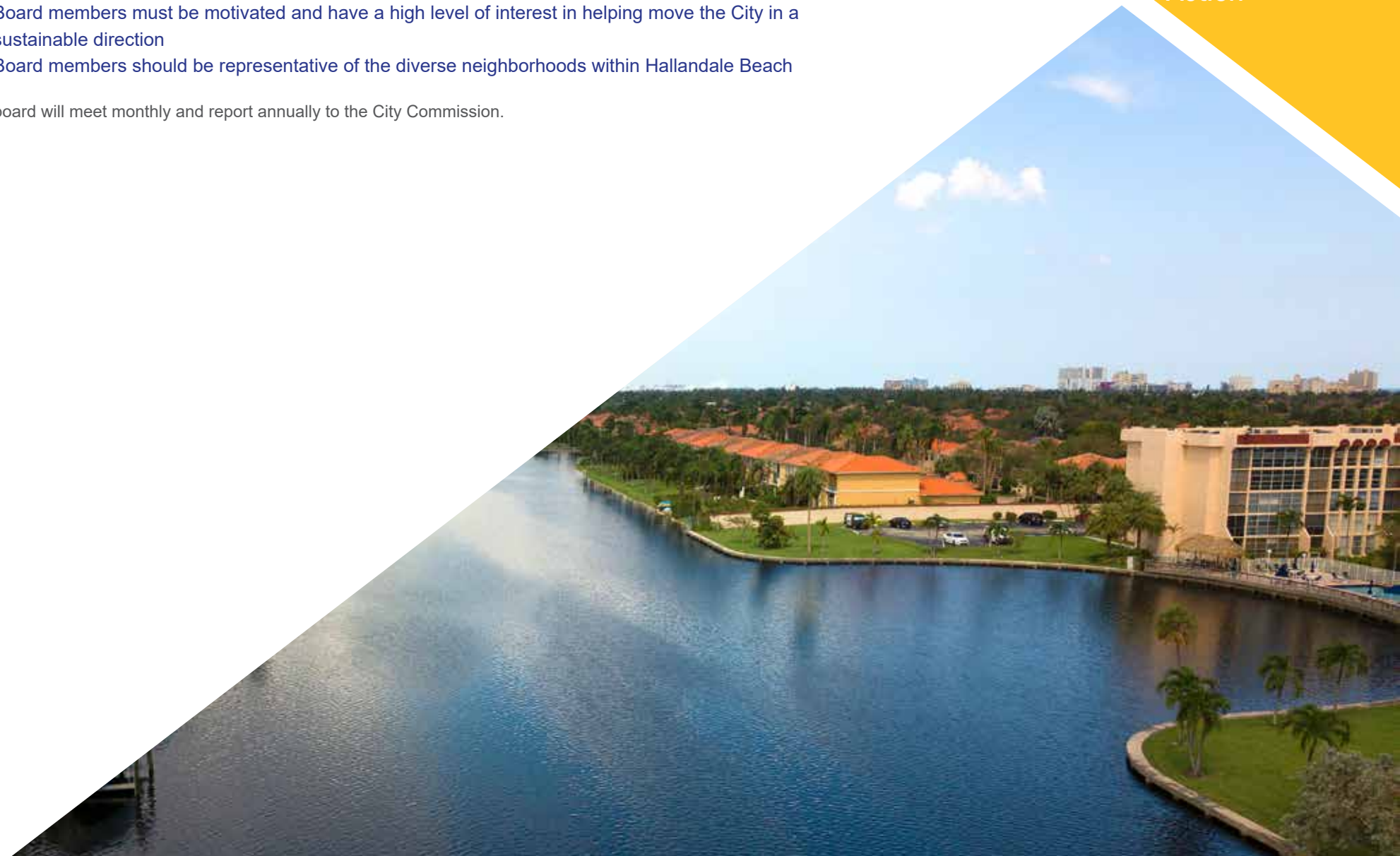


## Action

Members will meet the following criteria:

- No less than the majority of the board shall be residents of the City of Hallandale Beach
- Any members not residing in the City shall own a business, be employed full-time or attend a school full-time in the City
- Board members should have experience in the field of sustainability (resource conservation, smart growth/land planning, waste reduction, transportation, energy efficiency and renewables, green building, food security, resiliency or community outreach etc.) OR the desire to become familiar with and embrace these concepts
- Board members must be motivated and have a high level of interest in helping move the City in a sustainable direction
- Board members should be representative of the diverse neighborhoods within Hallandale Beach

The board will meet monthly and report annually to the City Commission.





## SUSTAINABILITY BRANDING

The City has approved a Green Initiatives logo in order to highlight the City's sustainable initiatives and projects. Any City program or policy that espouses the principles of sustainability may use this logo in the future. The portfolio of projects will represent a clearinghouse of sustainable government operations that visibility communicate the City's investments to the public.

Project managers interested in developing and implementing a sustainability project could apply to the newly created City Sustainability Committee in order to use the logo. The logo will be awarded to projects that meet specific sustainability performance criteria. Projects that earn this logo could receive priority treatment during the project approval and budgeting processes.

This program will operate similarly to Broward County's "Seal of Sustainability" program, which demonstrates the County's commitment

to sustainable operations. A catalogue of qualifying projects is maintained on the Broward County website, and the seal is affixed to qualifying projects, such as the County's propane-fueled "TOPS" mini-buses.

## GREENHOUSE GAS MITIGATION EDUCATION AND OUTREACH CAMPAIGN

The City will create an education and outreach campaign to engage citizens and businesses in GHG reduction efforts, beginning with a survey, to understand community members' attitudes and behaviors concerning climate change action. The goal will be to identify common concerns, raise awareness and find sustainability champions to support the City's efforts to go green. Using survey results as a baseline knowledge assessment, the City will create a public outreach campaign that engages and educates residents on the City's GHG mitigation, resilience and sustainability efforts.



Action







## Action

## FUNDING & EVALUATION

Sustainability requires investment. By focusing on quick wins with big returns, the City can leverage its success and prove that low-impact, efficient and responsive government makes financial sense. These successes can help pave the way for other, lower ROI projects, which are no less important for community members and the environment.

The City has already begun investing in cost-effective solutions that will reap long term economic, social and environmental rewards. However, more direct investment is required. The City will also focus on attracting external resources, such as low-interest loans, grants and incentives from federal, state, local and private sources. Many of this SAP's projects are eligible for such support. With the newly established grants development office this focus is now possible.

Sustainability requires evaluation and as projects are implemented, progress must be measured at regular intervals to ensure that the projects are performing as planned. In some cases, the City may make adjustments or course corrections to ensure desired results are obtained. It is necessary to measure the success of a sustainability program in order to manage it effectively. It has been said that, "you are what you measure".

The STAR Community Rating System (STAR) is the nation's first voluntary, self-reporting framework for evaluating, quantifying, and improving the livability and sustainability of U.S. communities. Used as an evaluation tool, STAR facilitates meaningful comparisons of cities' sustainability performance, addressing social, economic and environmental aspects of the community.

As a first step towards certification, the SAP Project Management Team used STAR to benchmark, Hallandale Beach's sustainability progress to three similar communities (Pinecrest, FL, Park Forest, Illinois and Broward County, Florida). The team also performed a feasibility assessment to determine if the City is ready to pursue STAR certification. The results show that Hallandale Beach is comparable to its regional peers, with the potential to earn a 3-STAR rating. City Commission acceptance of this SAP will authorize the path to STAR certification for the City to begin.

See the Appendix for the results of benchmarking and the Star Communities Certification project in this section for the City's next steps towards STAR certification.



### UTILITY MANAGEMENT SYSTEM

- NPV: \$19,000
- ROI: 36%
- Contribution to Goal: 90%
- Lead Department / Division: Innovation Technology
- Responsibility: IT Director

### REVOLVING FUND

- NPV: 0%
- ROI: ∞\*
- Contribution to Goal: \*\*
- Lead Department / Division: Finance
- Responsibility: Finance Director

### COMPLETE A GREENHOUSE GAS INVENTORY

- NPV: -24,000
- ROI: -100%
- Contribution to Goal: \*
- Lead Department/Division: Public Works
- Responsibility: Green Initiative Coordinator

### STAR COMMUNITIES CERTIFICATION

- NPV: -\$13,000
- ROI: -100%
- Contribution to Goal: 0%
- Lead Department/Division: Public Works
- Responsibility: Green Initiatives Coordinator

\*For projects with low or no cost, the return on investment is mathematically infinite, denoted by the symbol: ∞

\*\*The contribution of this projects to goal cannot be calculated at present but will be calculated as projects and project ideas are further developed.

# PROJECTS

The City will strive to achieve the financial performance projected for the portfolio of projects included in this plan. It will also plan to establish new internal mechanisms for ensuring that these projects have the required resources to move forward. Sustainability and resiliency must become embedded in the annual budget development process. The revolving fund project will help make this happen.

A well-designed evaluation process will make the entire sustainability program more effective, and will also allow the City to communicate its progress to a wide variety of stakeholders. Evaluation requires a comprehensive but focused system for collecting, managing and analyzing data, a schedule, means of obtaining feedback from stakeholders and a provision for continual improvement. Three projects will help advance these concepts, including Utility Management System, complete a Greenhouse Gas Inventory and STAR Communities Certification.

## UTILITY MANAGEMENT SYSTEM

Integrating utilities (electric, water and other commodity billings) into a software solution or database can track, trend and report on utility use and help verify results from energy efficiency investments. Typically, this can result in energy savings ranging from 1-10% from prioritizing investments, identifying erroneous billings and learning of anomalies before they become costly.

For this project, the City will utilize software tools to manage the City's FPL energy utility bills on a monthly basis. The effort will include auditing bills, tracking usage and costs, benchmarking facility performance, tracking the results of energy savings projects, analyzing trends and reporting on performance. Over time, the City will expand the tool to include other facilities-based utilities and services, including water and waste.

Such a system enables much more creative control of the City's resource use. For example, it would enable departments to be assigned a "budget" for resource use and to be "charged" for utilities. It also supports the accounting systems required to implement a revolving fund that will support long-term investment in sustainability projects at the department level.

Direct economic benefits of this project are conservatively estimated at one percent of electricity expenditures, with a net present value of \$19,000 over the 10 year project life. Other benefits include facilitating sustainability reporting and program management, and the potential to identify additional

cost savings through use of the tool. Implementing the project will require selecting and procuring a utility management solution. The City will also populate the free, online ENERGY STAR Portfolio Manager with facility utility data. Costs are estimated at \$50,000 for an off-the-shelf Utility Management Solution, including implementation, configuration, customization, interfaces and training, with an additional annual software licensing fee of \$2,500 per year.

## REVOLVING FUND

Measures designed to save resources can be highly cost effective. However, these measures require sustained investment to fully realize benefits. A revolving fund is a method of providing on-going access to capital for "green" projects. Initially, the revolving fund is "seeded" with capital. Sources include appropriations, grants, rebates and savings from existing projects. The fund invests in resource conservation projects with repayments from savings going back into the fund and thus helping to finance new projects. Cost savings realized from high ROI projects are leveraged to help fund low ROI, but environmentally or socially impactful projects. This approach reduces the amount of funding needed from the City's General and Enterprise Funds.

The projects included in this SAP will return over \$8 million in revenue and avoided costs over 10 years. The revolving fund will allow these returns to be reinvested in other green initiatives as time goes on, allowing continual improvement and expansion of the sustainability program.



Action







# Accelerate < Progress



Action

The City should establish a revolving fund for the recommendations included in this plan. A Revolving Fund Management Committee will develop and administer policies, approved by the City Commission, for fund management, including criteria for eligible energy and water efficiency projects and financial performance. Project performance will be monitored and verified. **The following steps will be needed:**

- Establish a Revolving Fund Management Committee
- Create an accounting and financial procedures plan
- Develop guidelines designating which projects qualify for funding
- Identify funding sources for seed capital
- Establish procedures for tracking performance of funded projects
- Establish procedures for reinvesting project savings in new projects

No additional costs besides staff time will be needed to set up the revolving fund.

## COMPLETE A GREENHOUSE GAS INVENTORY

A Greenhouse Gas (GHG) Inventory is an essential element of the City's sustainability baseline which will help the City to understand the magnitude and sources of GHG emissions. The GHG inventory will also allow Hallandale Beach to measure progress in GHG mitigation going forward and will identify the most significant emissions sources so the City can develop policies to address the issue. Completing an inventory will be the first step towards honoring the City's U.S. Climate Mayors commitment to uphold the Paris Climate Agreement, which was adopted on August 16, 2017 by Resolution 2017-91. This project will allow the City to create a targeted set of consistent policies, strategies and projects aimed at reducing emissions and establish goals for emissions reduction.

In late 2017, the City applied for grant funding to conduct the inventory through the Community Foundation of Broward's ECO Broward Grant. This proposal was unsuccessful, however staff will resubmit for funding in future grant cycles. Once funding is secured, the City will issue a Request for Quotes and select a qualified firm to develop the inventory for both local government operations and the community as a whole. The inventory will be based on established protocols such as those developed by the International Council for Local Environmental Initiatives (ICLEI), using web-based inventory software such as ICLEI's ClearPath tool. It will require a substantial data collection effort which will be integrated with sustainability data collected for the SAP.

The completed inventory will allow the City to benchmark GHG emissions against peer cities, forecast emissions trends under business as usual scenario and set informed and achievable emissions reductions goals. Costs of developing the inventory are estimated at \$24,500. Benefits include allowing the City to pinpoint facilities and infrastructure with above-average carbon footprints, potentially exposing inefficiencies that could lead to cost savings. The GHG Inventory will also give the City a reference point for evaluating the carbon mitigation benefits of potential sustainability projects to determine those opportunities that offer the best value to the City.






## STAR COMMUNITIES CERTIFICATION

STAR is premised on a framework of sustainability goals, objectives and evaluation measures. This framework is comprised of 526 inductors within the following areas:

- Climate and Energy
- Built Environment
- Economy and Jobs
- Education, Arts and Community
- Equity and Empowerment
- Health and Safety
- Natural Systems

STAR rates communities on a 5-point scale and awards leadership certifications for 3-STAR, 4-STAR and 5-STAR ratings. Certified STAR communities are part of a select group. Currently, there are nearly thirty 3-STAR communities nationwide, and five in Florida, including Monroe County, the City of St. Petersburg and the Village of Pinecrest. Broward County and West Palm Beach are currently the only 4-STAR communities in Florida, and there are only four 5-STAR communities nationwide.

### These include:



Baltimore, Maryland  
Cambridge, Maine  
Northampton, Maine  
Seattle, Washington



Action





## Action

Hallandale Beach has completed the initial feasibility assessment step towards STAR certification. Based on the results of this initial assessment, the City should be able to achieve a 3-STAR rating. This project will take the next steps towards achieving STAR certification by collecting and analyzing data and compiling application materials.

Once the City is ready to report, it must subscribe to the STAR Full Access Package to access the full suite of tools and resources. After that, the City will create a certification team composed of internal staff members or an external green team comprised of community members. Over the following months, the City will align existing City policies and programs with the Rating System, gather data and enter it into STAR's online reporting platform and submit the online application for verification by STAR. Once awarded, the STAR Community Rating is valid for four years, after which the City will have the opportunity to rectify and potentially improve its rating. This effort is important not only for sustainability reasons but also for future financing of major projects. Rating services like Moody's, Standard and Poor's and Fitch are all considering making sustainability and resiliency an element of establishing credit ratings for city debt. This is a very important factor in establishing interest rates.

The annual cost of subscription to the STAR Full Access Package is \$1,000, plus a one-time verification fee of \$3,000. The certification process will be completed by City staff, possibly with the help of a community green team. Direct economic benefits have not been estimated at this time, but the process will help the City track and evaluate performance and communicate progress to stakeholders. The City will also have the opportunity to learn from and adopt best management practices included in the STAR framework. Achieving a 3-STAR rating would result in positive press and greatly enhance the City's sustainability brand.

## FUTURE STEPS

### SET GHG EMISSIONS REDUCTION TARGETS

Once a GHG Inventory has been completed, the City should adopt specific targets for GHG emissions reductions both for government operations and major private pollution sources. The goals should align as much as possible with those set by other local governments in the South Florida region, as greenhouse gases don't respect political boundaries. Miami-Dade and other Compact counties follow the GHG emissions reduction goals set by the U.S. Cool Counties Climate Stabilization Declaration in 2008. These targets include an 80% emissions reduction by 2050 from 2008

levels. In order to achieve this goal, Miami-Dade County's set interim targets of 20% emissions reduction from 2008 levels by 2020 and a 10% reduction over every five-year period through 2050. Broward County has set a goal to reduce emission 15% from 2015 levels by 2020 and 80% by 2050.

### NON-MARKET VALUATION OF SAP PROJECTS

Many environmental and social benefits are not recognized by the economy. For example, clean air and water are not traded on the stock exchange. The value of healthy and productive employees is not typically included when considering investment in a building renovation. As a result, environmental and social benefits may be undervalued and decisions regarding sustainability projects may not accurately reflect their true value to the community.

Economists often label the economic value of environmental and social goods and services as "non-market" values because they are not traded in markets. All projects in the SAP have non-market value. Some projects consist mostly of non-market value. Examples include the plan's Land Use and Transportation and Natural Resources and Resilience projects. Estimating non-market values could dramatically change the relationship between the perceived benefits and costs of these projects.

There are many methods for calculating non-market values. One increasingly widespread framework for evaluating one aspect of non-market value is the social cost of carbon. The social cost of carbon is an estimate of the long-term damage done by a ton of carbon dioxide to agricultural productivity, human health and property as a result of climate change. However, due to modeling and data limitations, it does not include all social costs.





As the City's sustainability management matures, use of non-market values should be considered. For example, as part of a proposed greenhouse gas inventory, each SAP project's expected contribution to reduced carbon dioxide emissions could be estimated. These avoided emissions could be assigned a value based on the social cost of carbon. Other non-market values could also be estimated, such as the benefit of reduced air or water pollution, increased productivity or reduced traffic congestion. In doing so, the City should take care to establish clear standards for including estimates of non-market values into its projects that can achieve wide acceptance among its stakeholders.

### SUSTAINABILITY FEES

The City receives revenue from a variety of fees associated with its regulatory authority, particularly with respect to compliance with its codes and standards, as well as approval of development proposals. A portion of this existing revenue, or new fees, could be allocated to staff, projects, programs and other initiatives that improve the City's economic, social and environmental performance.

The Village of Pinecrest funds sustainability projects with fees collected through its permitting system. The Expedited Permit Program charges a higher fee to review building permits. Revenues from this program are earmarked for the Village's Sustainability Fund. The City of Jacksonville has established a citizen board that manages a fund sourced from environmental compliance violations. The board awards grants for community sustainability projects on a competitive basis. Miami Beach's Green Building Ordinance requires participants to post a Sustainability Fee Bond equal to five percent of the total construction value. Participants are refunded the fee based on their level of compliance with the City's green building requirements. Only the highest levels of attainment receive the full refund. Non-compliance results in the City retaining 100% of the fee. Fees collected directly fund the City's sustainability efforts.



## Action



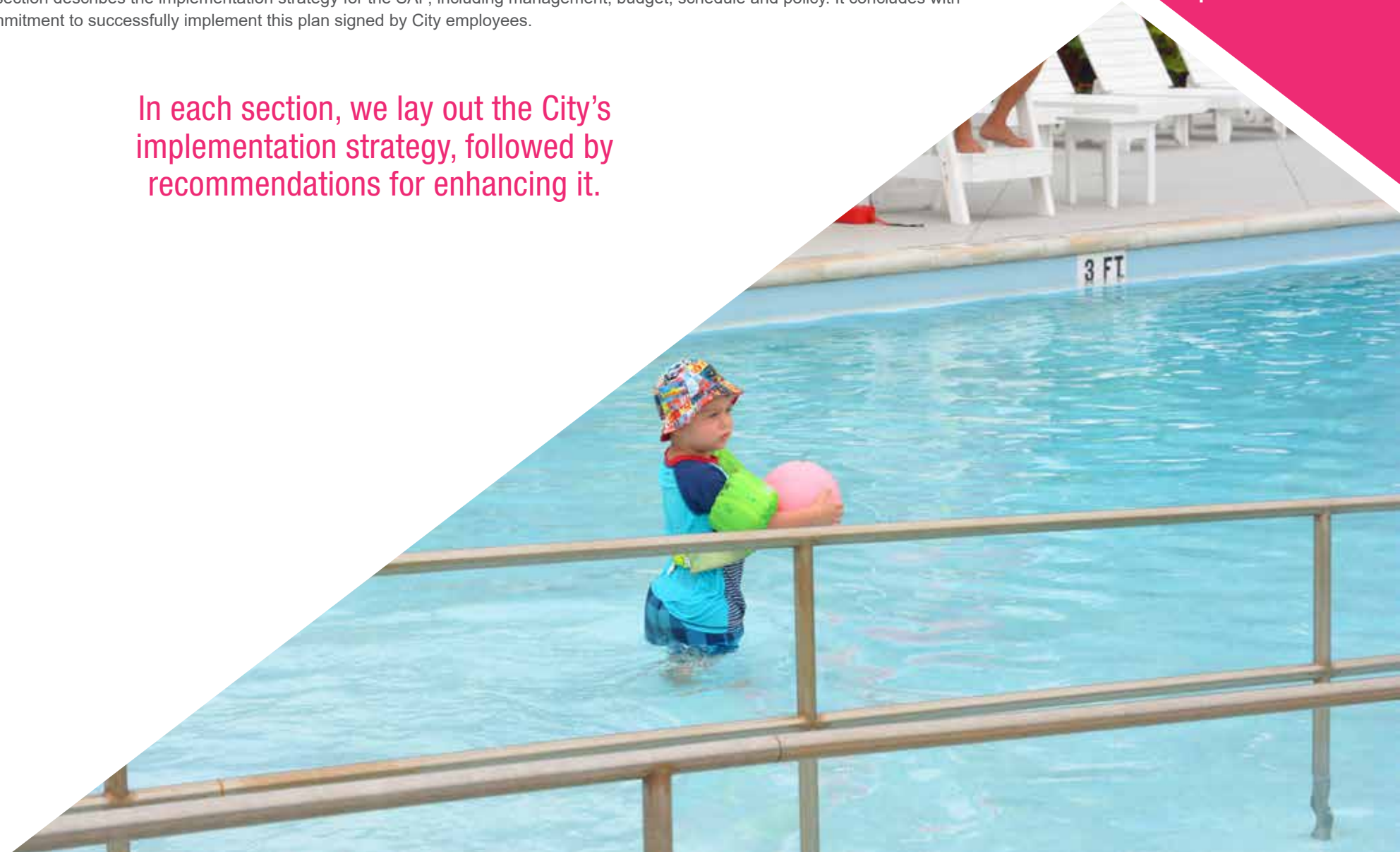
# Implementation

The Sustainability Action Plan contains 27 projects in six focus areas to reduce the City of Hallandale Beach's environmental footprint, while expanding services over the next five years. Together they have the potential to generate revenue or cost avoidance of \$7 million and a net benefit of over \$2.2 million over a period of 10 years. The next step is to manage, budget, schedule and commit to realizing these projects. In some instances, the City may have to implement policy reforms to ensure that this SAP is a success.

This section describes the implementation strategy for the SAP, including management, budget, schedule and policy. It concludes with a commitment to successfully implement this plan signed by City employees.

In each section, we lay out the City's implementation strategy, followed by recommendations for enhancing it.

Implementation





## MANAGEMENT

With the backing of the City Commission and the City Manager, implementation of the City's Sustainability Action Plan will be overseen by our Green Initiatives Coordinator. Each project is associated with a detailed management strategy. These define the project objective, targets, strategies, actions and schedules. The collective impacts on City resources and contribution towards goals have been estimated. Required investments have been projected, along with avoided costs, revenues and measures of life-cycle economic performance. The lead City department and project manager have been identified and will be accountable for results. Sustainability project management forms containing this information are included in the Appendix. The key here is that accountability, financial separation into measurable outcomes and individual responsibility have all been established. The next step is policy making by the City Commission.

One of the projects, Integrate Sustainability into Employee Training and Increase Employee Participation, aims to increase awareness of this plan and its projects among all City staff so that they can play a role in

bringing it to life. This buy-in is critical once the policy is established and will ensure that traditional silos that inhibit teamwork are broken down and eliminated.

While this plan includes 27 projects estimated to generate about \$7 million in revenue / cost avoidance and \$2.2 million in net benefits over 10 years, more projects will have to be developed and implemented to achieve short- and long-term goals. Accordingly, this plan is intended as a living document. The SAP is designed so that increasingly refined awareness of the City's sustainability performance leads to ideas for next steps, which are developed into additional projects. This is a continual improvement process of planning, doing, checking and acting that characterizes the best-run organizations in the world. In today's world of disruptive technologies, the City of Hallandale Beach has the opportunity to disrupt the inhibitors to sustainability and resiliency and set the stage for future generations.

Continual updates to this SAP will help ensure that a culture of continuous improvement takes hold and that the SAP's goals are achieved.

## Implementation

Achieve < Goals



## KEY PERFORMANCE INDICATORS

The Utility Management System project will establish systems for gathering, tracking and reporting on key project data. It is the first step towards achieving one of this plan's goals: measuring and monitoring 50% of sustainability key performance indicators by 2022. To guide implementation of projects and goals, key performance indicators (or KPIs) must be established. KPIs are measurements used to evaluate the success of a project. As a group, they offer a rigorous method of assessing progress on the Sustainability Action Plan.

Based on the projects included in the plan, Table 6 lists KPIs and their annual unit of measure. Some KPIs are relevant to multiple projects. Some projects do not have KPIs at this time. For example, the Composting project involves completing a study, from which new projects and KPIs may be generated in the future.

Implementation

TABLE 6: RECOMMENDED KEY PERFORMANCE INDICATORS

Project	Unit of Measure	Projects
Streetlight Energy Use Intensity	Kilowatt-hours per Fixture	LED Streetlights
Streetlight Cost Intensity	Dollars per Fixture	LED Streetlights
Interior Lighting Density	Watts per Square Foot	LED Interior Lighting
Facility Energy Use Intensity	Thousand British Thermal Units per Square Foot	Solar Thermal Systems, Existing City Building Commissioning, HVAC Controls, Expanded Service Hours Work Week
Facility Energy Cost Intensity	Dollars per Square Foot	Solar Thermal Systems, Existing City Building Commissioning, HVAC Controls, Expanded Service Hours Work Week
Vehicle Cost Per Mile	Dollars per Vehicle	Electric Vehicles and Infrastructure
Vehicle Energy Use	Gaseous Gallons Equivalent	Electric Vehicles and Infrastructure, Expanded Service Hours Work Week
Vehicle Fuel Economy	Miles per Gallon	Electric Vehicles and Infrastructure, Increase Fuel Economy
Facility Water Use Intensity	Thousand Gallons per Square Foot	Indoor Water Fixtures and Fittings Efficiency, Expanded Service Hours Work Week
Facility Water Cost Intensity	Dollars per Square Foot	Indoor Water Fixtures and Fittings Efficiency, Expanded Service Hours Work Week
Vehicle Density	Vehicles per Full Time Equivalent Employee	Right Size Fleet
Vehicle Use Intensity	Vehicle Miles	Right Size Fleet
Reuse Water Rate	Reuse Gallons per Potable Gallons	Expand Reuse Water Projects
Irrigation Intensity	Gallons per Irrigated Acre	Irrigation Efficiency
Diversion Rate	Tons Diverted per Total Tons of Waste	Increase Community-wide Waste Diversion
Green Purchasing Rate	Dollars of Green Purchases per Total Purchases	Green Purchasing Program
Bicycle Level of Service	LOS Rating	Build-out Bicycle and Pedestrian Infrastructure
Pedestrian Level of Service	LOS Rating	Build-out Bicycle and Pedestrian Infrastructure
Employee Training Rate	FTEs Trained per Total FTEs	Integrate Sustainability Into Employee Training and Review



## SUSTAINABILITY DIVISION

Increasing the number of staff dedicated to sustainability management will be required to oversee a plan grounded in continual improvement. The current Green Initiatives Coordinator role could be initially re-conceptualized as a two-person division within the Public Works Department, consisting of a senior management role (e.g. “sustainability manager”) and a junior support role (e.g. “sustainability coordinator”). A third staffer would be co-managed by the Sanitation Division and be responsible for managing materials minimization for the City. Several South Florida municipalities with mature sustainability programs have such an organizational structure, including Broward County, Fort Lauderdale, Miami Beach, North Miami and Coral Gables. The costs of these additional two staffers is included in the Increase Community-wide Waste Diversion project.

## SUSTAINABILITY COMMITTEE

Under the Green Initiatives Coordinator’s leadership, 36 City staff have been involved in the development of this plan over a 10 month period. Of these, 25 were assigned to working groups corresponding to the plan’s six focus areas and took a direct role in developing the projects in our portfolio.

This structure could be formalized by establishing a standing Sustainability Committee. The committee would be composed of City staff representing the major functional areas of the City. Reflecting the process used to develop this plan, committee members could be organized by the focus areas of the plan, helping to oversee implementation of projects and fostering ideas for new projects.

The committee would function as a liaison between the proposed Sustainability Division and the City’s departments. It would also assist the Sustainability Division with responding to the city manager and City Commission and communicating with the public.

## SUSTAINABILITY ADVISORY COMMITTEE

Close to two dozen citizens participated in the preparation of this plan. Support of the Hallandale Beach community will be critical to its successful implementation.

Empaneling a group of qualified and interested citizens can help further prioritize the City’s Sustainability Action Plan, make recommendations for implementation, help develop new initiatives and communicate with citizens and City leaders.

The Sustainability Advisory Committee could be selected by the City Commission, City Manager or future Sustainability Manager or some

combination of the three. Typically, members are selected based on relevant expertise and their ability to represent interested parties from the community. The board could hold regular, public meeting organized by the City’s future Sustainability Manager.

Similar institutions have been created at peer South Florida municipalities, including Broward County, Fort Lauderdale, Hollywood, Sunrise, Coral Gables, Miami Beach, South Miami, Key West, among others.

## INTEGRATION INTO STRATEGIC PLAN

The City’s 2017-2019 Strategic Plan includes specific initiatives to be undertaken within each of the City’s departments over a three-year period. The plan includes goals, strategies to accomplish them, measure progress and an estimate of fiscal impact. The goals and projects in the SAP, which include KPIs, fiscal impact and responsible departments, should be incorporated into the present planning cycle for the City’s 2020 – 2022 Strategic Plan.

## Implementation





Implementation

## INTEGRATION INTO THE REGIONAL CLIMATE ACTION PLAN

The South Florida Regional Climate Change Compact (Compact) developed the Regional Climate Action Plan (RCAP) to guide coordinated climate action among the region's municipalities. The RCAP contains recommendations, guidelines for implementation, and best practices for local governments to act in concert with the regional agenda for greenhouse gas emissions reduction and climate resilience. The City of Hallandale Beach should aspire to regional leadership on climate action and intends to utilize RCAP as a benchmark for its success.

The most recent version of RCAP was released in December 2017. It contains approximately 76 recommendations for municipalities that are relevant to Hallandale Beach. According to the Compact, Hallandale Beach has completed 29 recommendations, or 38% of the total. An informal analysis indicates that the contents of this plan validates completion of about 35 additional recommendations, growing the total to approximately 64 recommendations completed, or 84% of total recommendations. Completing and implementing a Vulnerability Assessment and Adaptation Plan (VAAP), as recommended in this SAP, will be credited with a large majority of this increase.

As this living document develops, the City intends to continue to coordinate its planning with the Compact and the RCAP with the aim of completing 100% of its recommendations between 2022 and 2040.

## REPORTING

This plan includes a suite of short-term goals and a portfolio of projects designed to blaze a path towards achievement. Accordingly, it is important to report on the City's progress as it moves towards 2022, when its short-term goals should be achieved.

Many cities that have established plans similar to this SAP report regularly on progress.

For example, the City of Fort Lauderdale published its Sustainability Action Plan in 2010. In 2015 it published a progress report that detailed goals it had achieved, the projects it had completed and the work that remains.

Aided by the KPIs established by the SAP long with the goals and projects within the Funding & Evaluation focus area that are designed to systematically measure them, the City plans to periodically publish updates to the SAP. The updates will report on progress towards achieving goals and the status of SAP projects.

These updates will also fulfill the intent of this plan to be a living document. The updates will provide the opportunity for new projects to be added to the SAP, as needed, to fulfill the City's vision to improve the quality of life in our resilient coastal community now and into the future.





## FUNDING

The estimated budget for implementation of the 27 projects included in the SAP over five years is \$3.8 million, growing to \$5.4 million by year 10. The first year cost of the plan is \$340,000, growing to about \$1.3 million in 2019, then slowly leveling off thereafter.

Not all projects require investment. Nearly one third of the projects in the portfolio are designed for implementation with no or low cost. This is accomplished by integrating sustainability into expenditures that are already planned, or by accomplishing the project using in-house effort. These include Increase Fuel Economy, Right Size Fleet, Expanded Service Hours Work Week, Green Purchasing Programs, Bikeshare, Dune Protection, Low Impact Development, Communications Plan, Develop Green Event Policies, and Revolving Fund.

Implementation

TABLE 7: ESTIMATED SUSTAINABILITY ACTION PLAN BUDGET

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
LED Streetlights	\$64,333	\$64,333	\$64,333	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$193,000
LED Interior Lighting	\$0	\$0	\$0	\$41,000	\$41,000	\$0	\$0	\$0	\$0	\$0	\$82,000
Solar Thermal Systems	\$0	\$0	\$14,000	\$10,500	\$10,500	\$0	\$0	\$0	\$0	\$0	\$35,000
Existing Building Commissioning	\$80,000	\$0	\$0	\$0	\$0	\$80,000	\$0	\$0	\$0	\$0	\$160,000
Electric Vehicles & Infrastructure	\$0	\$27,864	\$27,864	\$0	\$0	\$0	\$0	\$0	\$0	\$12,500	\$43,229
Increase Fuel Economy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indoor Water Fixtures and Fittings Efficiency	\$0	\$10,000	\$12,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$22,000
HVAC controls	\$75,000	\$86,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$161,000
Right Size Fleet	\$32,513	\$32,513	\$32,513	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$97,539
Expand Reuse Water Projects	\$88,000	\$443,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$531,000
Expanded Service Hours Work Week	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Irrigation Efficiency	\$15,000	\$15,000	\$15,000	\$15,000	\$15,000	\$0	\$0	\$0	\$0	\$0	\$75,000
Increase Diversion of Residential Waste	\$0	\$550,000	\$550,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$300,000	\$3,200,000
Green Purchasing Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Composting	\$0	\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$50,000
Bikeshare	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Build out Bicycle and Pedestrian Infrastructure	\$0	\$10,000	\$170,000	\$280,000	\$270,000	\$0	\$0	\$0	\$0	\$0	\$730,000
Develop a Vulnerability/Adaptation Assessment	\$0	\$86,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$86,000
Dune Protection	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Low Impact Development	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Integrate Sustainability into Employee Training & Increase Employee Participation	\$0	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$3,500	\$31,500
Communications Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Develop Green Event Policies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Management System	\$50,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$77,000
Revolving Fund	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Complete a GHG Inventory and Set Reduction Targets	\$0	\$25,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$25,000
STAR Communities Certification	\$0	\$4,000	\$1,000	\$1,000	\$1,000	\$1,000	\$4,000	\$1,000	\$1,000	\$1,000	\$15,000
Total	\$339,820	\$1,345,185	\$828,185	\$654,000	\$644,000	\$387,500	\$310,500	\$307,500	\$307,500	\$295,000	\$5,419,189

The plan is designed to pay for itself within five years. Several of the projects generate revenue, others eliminate expenditures. These savings grow over time, resulting in over \$8 million in benefits over ten years. After accounting for all costs, which total just over \$4 million, the City will realize a net benefit of about \$3.3 million. A full accounting of costs, benefits and net results by project over ten years is included in the appendix.

The plan includes a project Revolving Fund that aims to harness the benefits generated, for example, by energy efficiency projects that reduce utility bills. The fund tracks such savings and returns a percentage back to the fund to help support new projects.

A successful Revolving Fund requires an initial investment in order to generate returns that can be capitalized by the SAP in the future. One goal of this plan is to fund it with 50% internal funds and 50% external funds by 2022.

The next step is to identify how each project in this plan will be funded; either internally, by identifying the specific funding source, or externally, by applying for grant funds, entering into a public private partnership, or other cooperative methods. Some projects may be funded by a combination of internal and external sources. Two of the projects in this plan have already been identified as good candidates for grant funding, Develop a Vulnerability/Adaptation Assessment; and Complete a GHG Inventory and Set Reduction Targets. Many other projects in this plan may also be eligible for external support. Examples are included in Table 8. This is not meant to be an exhaustive list, since availability of grants is subject to change.

## Implementation

TABLE 8: SELECTED EXTERNAL FUNDING OPPORTUNITIES

External Funding Source	Projects
City of Hallandale Beach Revolving Fund (Project FE2)	All projects
Public-Private Partnerships	LED Streetlights, LED Interior Lighting, Solar Thermal Systems, Indoor Water Fixtures and Fittings Efficiency, HVAC Controls
Florida Power and Light Business Energy Efficiency Rebates	LED Streetlights, LED Interior Lighting
Community Foundation of Broward ECO Broward Grant	LED Streetlights, LED Interior Lighting, Solar Thermal Systems, Existing City Building Commissioning, HVAC Controls, Increase Community-wide Waste Diversion, Composting Feasibility Assessment, Build-out Bicycle and Pedestrian Infrastructure, Develop a Vulnerability/Adaptation Assessment, Integrate Sustainability into Employee Training and Increase Employee Participation, Utility Management System, Complete a Greenhouse Gas Inventory and Set Reduction Targets, STAR Communities Certification
Florida Department of Environmental Protection Coastal Partnership Initiative	Develop a Vulnerability/Adaptation Assessment
Broward County MPO Unified Planning Work Plan	Electric Vehicles and Infrastructure, Build-out Bicycle and Pedestrian Infrastructure
South Florida Regional Planning Council Collaboration	Electric Vehicles and Infrastructure, Develop a Vulnerability/Adaptation Assessment
FEMA Pre-Disaster Mitigation Grant Program	Develop a Vulnerability/Adaptation Assessment
FDACS Florida Small Community Energy Efficient Lighting Grant Program	LED Streetlights, LED Interior Lighting
Florida Department of Economic Opportunity Small Cities Community Development Block Grant	Expand Reuse Water Projects, Build-out Bicycle and Pedestrian Infrastructure
National Oceanic and Atmospheric Administration Broad Agency Announcement	Develop a Vulnerability/Adaptation Assessment
South Florida Water Management District Cooperative Funding Program	Indoor Water Fixtures and Fittings Efficiency, Expand Reuse Water Projects, Irrigation Efficiency
Funders' Network for Smart Growth and Livable Communities Partners for Places Grant	Electric Vehicles and Infrastructure, Composting Feasibility Assessment, Build-out Bicycle and Pedestrian Infrastructure, Develop a Vulnerability/Adaptation Assessment, Complete a Greenhouse Gas Inventory and Set Reduction Targets, STAR Communities Certification
Kresge Environment Program	Composting Feasibility Assessment, Develop a Vulnerability/Adaptation Assessment, Complete a Greenhouse Gas Inventory and Set Reduction Targets, STAR Communities Certification



## SCHEDULE

Table 9 depicts the schedule for implementation of SAP projects. Each project's expected year of initiation and completion is shown. The relative intensity of investment in each year is shown by the value of the color - the darker the value the larger the investments.

Implementation

TABLE 9: PROJECT SCHEDULE

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
LED Streetlights										
LED Interior Lighting										
Solar Thermal Systems										
Existing Building Commissioning										
Electric Vehicles & Infrastructure										
Increase Fuel Economy										
Indoor Water Fixtures and Fittings Efficiency										
HVAC controls										
Right Size Fleet										
Expand Reuse Water Projects										
Expanded Service Hours Work Week										
Irrigation Efficiency										
Increase Diversion of Residential Waste										
Green Purchasing Program										
Composting										
Bikeshare										
Build out Bicycle & Pedestrian Infrastructure										
Develop a Vulnerability/Adaptation Assessment										
Dune Protection										
Low Impact Development										
Integrate Sustainability into Employee Training & Increase Employee Participation										
Communications Plan										
Develop Green Event Policies										
Utility Management System										
Revolving Fund										
Complete a GHG Inventory & Set Reduction Targets										
STAR Communities Certification										

## POLICY

This SAP requires new policies be developed and implemented.

In addition to incorporating goals and projects into the City's management, budget and project management processes, updating and amending Hallandale Beach's Comprehensive Plan, Code of Ordinances and Design Guidelines Manual provide opportunities to underscore the City's commitment to implementation.

## COMPREHENSIVE PLAN

Cities are increasingly incorporating sustainability into their Comprehensive Plans (CP). The most effective tend to incorporate sustainability into the core values of the CP and throughout each of the elements at the Goal, Objective and Policy levels.

The City has begun this process by collecting most of the existing sustainability goals, objectives and policies that occur throughout the CP in the Conservation Element. These include items related to all of the focus areas included in the SAP planning effort.

In the City's 2017-2019 Strategic Plan, the Development Service department has committed to developing a new element of the CP dedicated to preparing for climate change. This follows on recently proposed amendments to the Coastal Management Element, including goals to: reduce the City's Community Rating System (CRS) score; identify vulnerabilities to sea level rise; develop adaptation strategies in collaboration with the County and the Southeast Florida Regional Climate Change Compact; and establish Adaptation Action Areas (AAAs) within the City. AAAs designate areas susceptible to flooding and vulnerable to the related effects of sea level rise for the purpose of prioritizing funding for planning and infrastructure.

A summary of the Sustainability Action Plan, including an overview of vision, goal and projects, will be included in the Conservation Element of the Comprehensive Plan. Individual components will also be incorporated into the CP under the relevant elements. Table 10 includes recommendations for incorporating individual components into specific elements of the Comprehensive Plan.

## Implementation

TABLE 10: RECOMMENDED SAP COMPONENTS FOR INCORPORATION INTO THE COMPREHENSIVE PLAN, BY ELEMENT

Comprehensive Plan Element	SAP Components to Be Incorporated
Introduction	Vision
Transportation	Transportation Goal Bikeshare, Build-out Bicycle and Pedestrian Infrastructure Projects
Sanitary Sewer, Solid Waste, Stormwater Management, Potable Water & Natural Groundwater Aquifer Recharge Element	Water, Materials Minimization & Recycling Goals Increase Diversion of Residential Waste, Low Impact Development Project
Coastal Management	Infrastructure, Flood Hazard, Coastal Habitat Goals Develop a Vulnerability/Adaptation Assessment, Dune Protection Plan Project
Conservation Element	Electricity, Fuel, Development, Evaluation, Training and Communications Goals
Capital Improvements	LED Streetlights, LED Interior Lighting, Solar Thermal Systems, Indoor Water Fixtures and Fittings Efficiency, HVAC Controls, Expand Water Reuse Projects, Irrigation Efficiency, Build out Bicycle & Pedestrian Infrastructure

## CODE OF ORDINANCES

Incorporating Sustainability Action Plan components into the City's Code of Ordinances (CO) provides a high level of accountability for implementation. In addition, some of the SAP's projects require inclusion in the CO for success:

- This SAP's near term goals should be adopted into the CO by Resolution, Ordinance or through other legal instruments.
- Several of this plan's projects could be supported by development of performance specifications, including LED Streetlights, LED Interior Lighting, Indoor Water Fixtures and Fittings Efficiency, and Irrigation Efficiency. Adopted into the Procurement Code, these performance specifications would ensure that future facility design, construction or renovation would exhibit the energy and water saving characteristics emphasized by these projects.
- As part of project the Green Purchasing Program project, standards will be developed for the purchase of IT equipment, consumables, durable goods, and cleaning products and materials. These standards will enhance ecological sensitivity, promote the health and safety of staff and citizens and reduce operating expenses. Once staff has developed the policy it should be adopted into the Procurement Code (Chapter 23).
- Similarly, the project Increase Fuel Economy involves changes to procurement practices within the City's vehicle fleet. This project requires replacement of qualifying vehicles with models demonstrating at least 50% greater fuel economy. As developed, fuel economy standards for purchase of new vehicles should be adopted into the Procurement Code.

Implementation

Go  Beyond





## Implementation

Several projects envision new processes or services that should be enabled by the Code of Ordinances:

- The Expanded Service Hours Workweek project is an analysis of changing the present five day work week into a four day work week with extended hours. Careful review will be necessary to ensure that the need to serve the public is not diminished and that staff productivity remains high. Best practices to predict outcomes will be used before this program is recommended, even on a trial basis.
- The Electric Vehicles and Infrastructure project will install electric vehicle support equipment (EVSE), such as electric vehicle charging stations at locations accessible to the public, such as the City Hall Complex. Policies will have to be developed regarding use of parking spaces associated with the EVSE as well as how the City plans to bill for electricity.
- The Bikeshare project will solicit proposals from third-parties to establish dockless bikeshare programs in the City. Often, several operators are active in the same City. Regulations for these companies as well as for users of their services will have to be established for the program to be successful.
- A definition of Low Impact Development should be included in the Code of Ordinances to support the Low Impact Development Standards project. As standards are developed for private development, they will need to be codified as well.
- The Develop Green Event Policies project will establish guidelines and requirements for City-managed events.
- The Revolving Fund project will establish a financial mechanism for sustainability projects. New policy will be required to enable the Budget and Program Monitoring Department to track the revenue or avoided costs of projects and recapitalize all or a portion of those benefits to fund new projects. The guidelines developed for the Revolving Fund should be incorporated into the annual budget process and be available in the CAFR.
- One of the next steps identified within the Land Use and Transportation focus area is to modify the City's Green Building Program (Section 8-37). Presently, it sets standards for new construction/major renovation of large commercial and multifamily buildings by reference to voluntary, third-party programs, such as LEED. Modifications to this program would establish prescriptive targets within these third-party programs consistent with the focus areas of this plan, such as energy efficiency, water conservation and waste minimization. Modifications would also extend high-performance design, construction and operations standards to civil infrastructure, landscapes or existing buildings with reference to third-party programs modified to achieve prescriptive targets. Initially these modification would only apply to municipal projects. Over time, the requirements would be extended to large commercial and multifamily structures.

The Appendix includes six sections that provide further detail on the contents of SAP:

- The Baseline section includes analysis of the City's performance in each of the SAP's six focus areas. Using 2016 data, it establishes the baseline performance against which all future progress will be measured.
- The Benchmarking section compares this baseline performance with other cities. It features use of the STAR Communities rating system, which is a third-party standard for evaluating the sustainability performance of municipalities using over 500 economic, social and environmental indicators.
- The Community section documents the results of two public meetings held during the development of the SAP to integrate stakeholders' interests into the plan.
- The Projects section features a detailed management plan for each project included in the SAP.
- The Budgets section includes detailed accounting of costs, benefits and net financial impact of each projects included in the SAP over a ten year period.





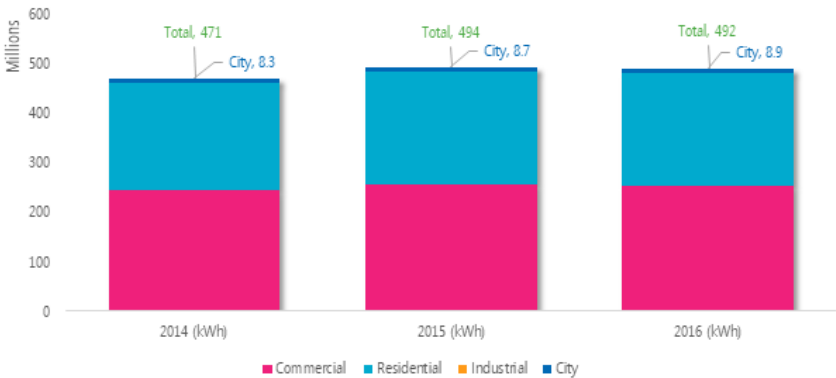
RESOURCE CONSERVATION & EFFICIENCY  
ENERGY USE

Energy use includes power to heat, cool, light and operate facilities and infrastructure.

The Hallandale Beach community as a whole used 492 million kilowatt-hours of electricity in 2016 at a cost of over 51 million dollars. The majority of community use occurs in the commercial sector (52%), followed by residential use (46%). City government use is relatively small (<two percent) and industrial use is close to zero (Figure 1). The Commercial sector includes multifamily housing, which is common in the City. Accordingly, the community's commercial energy use is higher than the state average, while its industrial use is much lower than average. From 2014 to 2016 usage has grown about four percent, while expenditure has decreased four percent, reflecting a reduction in the cost of electricity.

Data was not available on utility delivered or decentralized fuel consumption (e.g. natural gas, propane). This assessment assumes these fuels do not make up a significant proportion of overall energy use, as is the case state-wide.

FIGURE 1: HALLANDALE BEACH ELECTRICITY USE, 2014-2016\*



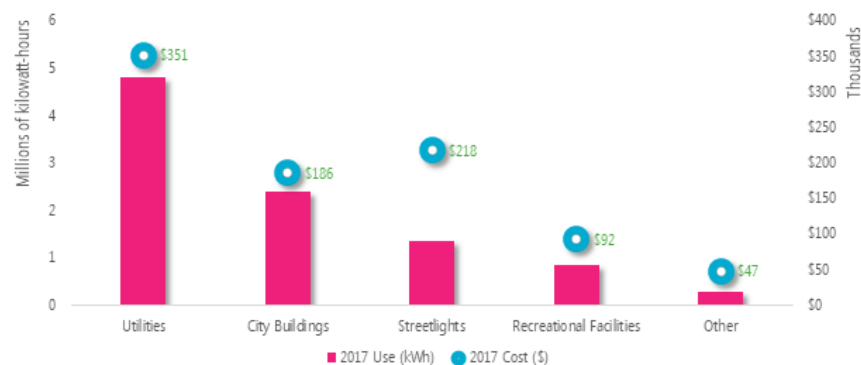
Excluding back-up generators, non-fleet City operations are 100% electric. Based on recent data and a subjective grouping of City operations FPL accounts, water utilities use half of the City's energy, followed by the City's buildings (25%), streetlights (14%) and recreational facilities (nine percent). While buildings use more electricity than streetlights, streetlights cost the City more (Figure 2). Unlike other end uses, streetlight costs include the amortized cost of poles and fixtures, as well as electricity use.



\*City totals do not include streetlights, estimated at 1.3 million kWh per year. Because it is an estimated value, it does not change from year to year.



FIGURE 2: CITY ENERGY USE AND COST BY ACCOUNT GROUPING\*



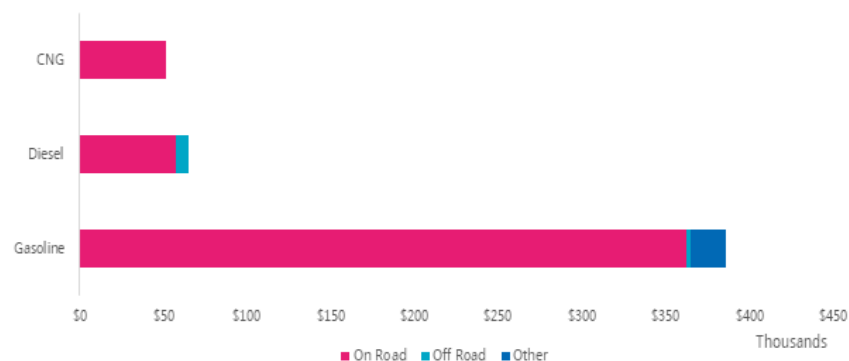
The state of Florida spends less on energy efficiency and saves less from the energy efficiency programs it does have relative to revenue and sales than the U.S. median. In 2014, the Florida Public Service Commission approved requests by utilities to significantly reduce the level of energy efficiency they must offer to end-users under the Florida Energy Efficiency and Conservation Act. In 2015, the state ranked 49 of 50 states in the share of energy produced from renewable resources.

Data is not currently available on the energy efficiency and renewable energy performance of the Hallandale Beach community. Citizens have access to energy efficiency programs offered by Florida Power and Light (FPL), which is the exclusive provider of electricity to the City. The City offers free LED luminaries and smart power strips to residents. Residents have access to Property Assessed Clean Energy Financing, which offers capital for energy efficiency and renewable improvements. The East Broward Solar Co-op recently offered cooperative purchasing of solar energy for Hallandale Beach residents. Cooperative purchasing may be available through this program in the future.

In 2014, the City entered into a Performance Contract with Siemens, which attracted about \$5.5 million in private investment in City facilities. Roughly 12 percent of this investment was dedicated to energy efficiency improvements in City facilities. Data on the results of this contract is not yet available, but will be in the future.

The City recently reached an agreement with FPL to replace existing streetlights with energy efficient Light-Emitting Diode (LED) luminaries.

FIGURE 3: FLEET FUEL EXPENDITURES BY FUEL AND VEHICLE TYPE



Through its Comprehensive Plan (CP), the City is committed to enforcing the Florida Building Code, including its Energy Code. This commitment is furthered by requiring green building practices (see Land Use Regulation).

The majority of the City's fleet is on-road (80%). Of these, over 80% are light duty (vehicles with Gross Vehicle Weight Rating <10,000 pounds), which includes passenger vehicles and light trucks.

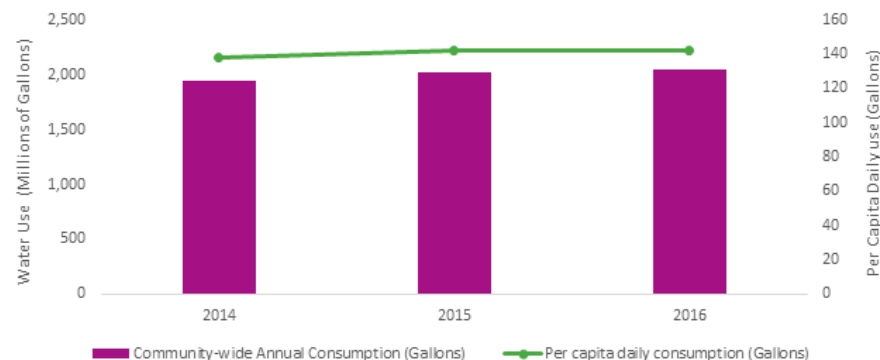
The average age of the fleet is approaching eight years. Gasoline vehicles/equipment tend to be newer and diesel vehicles older.

For all on-road vehicles, the annual number of vehicle miles traveled (VMT) is small, averaging less than 5,000 miles per year. While this may be due to the relatively small area of the municipality, it is also due to the high number of low-mileage vehicles in the fleet. About two thirds of on-road vehicles traveled less than 12,000 miles in a year.

While at least two City employees own an electric/plug-in electric vehicle, no such vehicles or associated infrastructure are currently used in the fleet. Two new, publicly accessible electric vehicle charging stations are planned as part of the redevelopment of Bluesten Park and the Main Fire Station. Other alternative fuels, such as propane or biofuels (e.g. ethanol, biodiesel) are not used.

The City has about 200 light-duty vehicles of model year 2011 or older, when the rate of increase of fuel economy began accelerating due to new Federal Corporate Average Fuel Economy standards.

FIGURE 4: COMMUNITY WATER USE TRENDS



The City operates a water utility that provides water to nearly all areas within the City limits. Since 2007, the City has observed significant reductions in water consumption, due to water restrictions imposed by the South Florida Water Management District. More recently, however, community water consumption in Hallandale Beach has increased by six percent. This is partially due to population increase, but per capita consumption has also grown by three percent since 2014. Figure 4 shows community-wide water annual consumption and per capita daily use for FY2014, 2015 and 2016.

The City recognizes that reducing water consumption is a key strategy for meeting the needs of current and future residents. Ultra-low flow fixtures are required for new construction and irrigation is restricted to once per week. Xeriscaping using native plants and use of reclaimed water is encouraged (City Ordinance 2011-14). Water customers are charged an increasing block rate for consumption and, through a partnership with Broward County, the City offers rebates for low-flow toilets. The City also waives the building permit fee for use of these toilets.

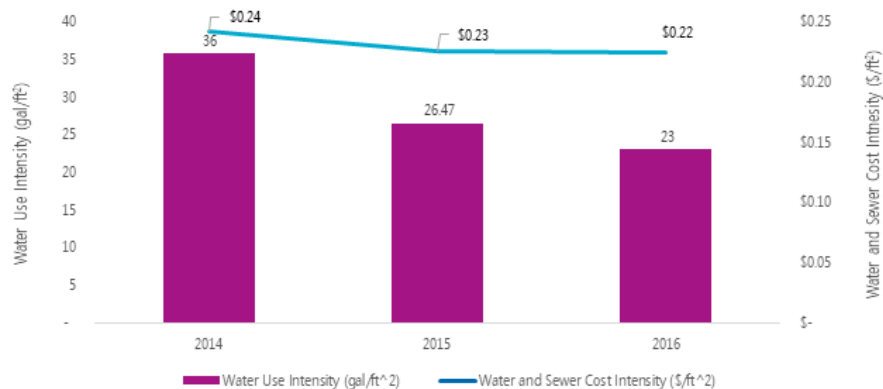
The City operates 41 water accounts for its facilities. In FY2016, these facilities used 4.26 million gallons (MG) for indoor uses and 18.42 MG for irrigation, at a cost of \$23,665 and \$42,222 respectively. Water use in facilities shows a declining trend from 2014 to 2016, however the combined water and sewer cost increased from \$6.90 to \$9.91 per 1,000 gallons. The cost for irrigation water increased from \$2.50 to \$2.70 per 1,000 gallons over the same period.

RS&H, Inc., the SAP consultant was able to match selected accounts to City facilities to evaluate Water Use Intensity (gallons per square foot of building space) and Water/Sewer Cost Intensity. Intensity measures all comparisons while controlling for growth (e.g. in the number of facilities). Figure 5 shows a slight declining trend in these indicators from 2014 to 2016.

#### ALTERNATIVE WATER USE / IRRIGATION

City Ordinance 2011-04 establishes mandatory, year-round restrictions on landscape irrigation to conserve water across the community.

FIGURE 5: WATER AND SEWER USE AND COST INTENSITY FOR SELECTED FACILITIES, FY2014 – FY2016



The City of Hallandale Beach has a Reuse Water Systems Policy for developers. This policy states that all new developments and/or substantial Improvements shall install a reuse water system (purple pipe) for irrigation that can service the entire development.

The City has established routes for the major distribution (transmission) lines of the reuse water system, which is constructed of purple PVC pipe to distinguish it from potable systems.

Hallandale Beach participates in the Broward County NatureScape Irrigation Service (NIS) Interlocal Agreement. The goal of the NIS program is to achieve water savings and protect water quality through more efficient landscaping practices. Under the agreement, NIS conducts evaluations, makes recommendations, and conducts follow-up evaluations at City facilities and parks. The City has saved 10 million gallons and \$13,500 per year through this program. NIS reports provided by the City indicate few if any City properties currently use reuse water for irrigation.

## GREEN PURCHASING AND CLEANING

Chapter 23, section 23-2 of the City's Municipal Code establishes Hallandale Beach's Procurement Department. One of its purposes is "to ensure that the city purchases recycled and other environmentally preferable products whenever the products meet the price and performance requirements of the city." Currently, purchasing authority is effectively decentralized, with individual City departments making many of their purchases independently. This approach may present a challenge to implementing green purchasing standards throughout City operations.

Hallandale Beach did not provide a green purchasing plan or any schedule of environmentally preferable products. The City has included environmental criteria in contracts for custodial services. A new green cleaning policy is currently being developed by staff.

The City has proposed an internal administrative policy which would prevent City funds from being spent on expanded polystyrene (Styrofoam) food service articles. This would also ban their use by contractors of City beach concessions.

## LOW IMPACT DEVELOPMENT (LID)

Low Impact Development (LID) is a type of Green Infrastructure (GI) that involves managing stormwater runoff and improving water quality by incorporating vegetation into infrastructure designs. LID designs can have multiple benefits at little if any additional cost. Broward County has GI goals which are promoted and implemented through the NatureScape program. The City is currently evaluating strategies to encourage developers, residents and businesses to retain additional stormwater beyond the amount already required on site, with a reduction in stormwater utility costs as a bonus.

## MATERIALS MINIMIZATION & RECYCLING

The City of Hallandale Beach Solid Waste Division provides fully-automated residential collection for municipal solid waste (MSW), and recycling, serving approximately 4,728 residential accounts on a weekly basis. Currently, residential garbage, or MSW containers, are the same size as the recycling containers, which may disincentivize residents from increasing the proportion of waste that is recycled. The Division also provides waste collection services for approximately 43 Multifamily residences and 5 commercial accounts. MSW and recycling are transported to the Waste Connections of Florida transfer station in Pembroke Park. MSW is further transported to the John E. Drury (JED) landfill in Orlando, approximately 180 miles from Hallandale Beach.

The City does not own or operate any landfills.

Other commercial accounts are serviced by private haulers. In FY 2016-2017, the City's permitted haulers included: Bicon, Inc., Lopefra Corp., Medley Metal Recycling, Panzarella

Waste & Recycling Services, Republic Services, Inc., Sunshine Recycling Services, Tropical Sanitation, Waste Connections, Waste Management, Waste Pro, and World Waste Recycling.

Yard waste (i.e. green waste materials and bulk items) is picked up under a contract with Waste Management. Yard waste is transported to the Monarch Hill Renewable Energy Park in Pompano Beach. The Monarch Hill facility generates electricity from methane gas produced by decomposing waste, powering approximately 9,000 homes annually.

In FY2016, Hallandale Beach generated 25,455 tons of MSW, 1,323 tons of recyclable materials, and 4,476 tons of yard waste. The City's MSW generation rate was nine percent above the national average of 2,600 lbs/household<sup>8</sup>. Hallandale Beach's community-wide diversion rate for 2016 was 19.4%, significantly lower than the national recycling rate of 34.6% and Florida's statewide recycling goal of 75% for the year 2020. The single family residential diversion rate is close to five percent. This very low rate leaves ample room for improvement, with the potential for the City to earn substantial recycling revenues as the diversion rate increases.

The City earns a rebate for recyclables of \$28 per ton (through a contract with Waste Connections of Florida), amounting to approximately \$37,000 in 2016. There is currently no composting program for the City. In 2016, the City paid \$49.85 per ton in solid waste tipping fees.

Hallandale Beach does not track waste collected at City Facilities by weight, so waste/recycling estimates are based on the number of containers at each facility and their pickup frequency, assuming each container was 80% full at pickup. In 2016, City Facilities generated 833 tons of MSW and 128 tons of recyclables for a 13% diversion rate. Table 1 summarizes waste management for City facilities and community-wide.

TABLE 1: WASTE MANAGEMENT SUMMARY, 2016

Metric	Hallandale Beach Facilities	Community-Wide
Bulk/Yard Waste (tons)	Not Provided	4,476
Garbage (tons)	833	25,455
Recycling (tons)	128	1,323
Diversion Rate	13%	19.4%
Recycling Rebate @ \$28/ton	\$3,574	\$37,037



Residents are assessed a monthly charge for waste pickup (averaging approximately \$21 per month). Multifamily and Commercial customers are charged waste and recycling fees that vary by container size and pickup frequency. These fees average \$12.51 per cubic yard (cy) and \$14.94/cy for Multifamily and Commercial, respectively. The City is investigating selling the Commercial and Multi-Family Solid Waste Collection Operation in FY18/19, while retaining residential commercial collection. This will allow the City to reduce expenditures and increase revenue (via working to increase single family recycling rates), improving the Solid Waste Division's financial performance. Monetizing is likely to affect the fees for solid waste and recycling. In other South Florida cities where waste management is outsourced, incentives for recycling are often not provided. In some cases, cities must pay a fee for recycling, in addition to losing potential recycling revenue.

The City spent \$8,678 on hazardous waste disposal in 2016. The City generates a variety of hazardous wastes, including: solvents (Acetone, Xylene, Methanol, MEK, and Gasoline); toxic liquids such as pesticides; corrosive liquids; ammonia solutions, corrosive solids, flammable lab packs, and flammable aerosols. The City also generates significant quantities of waste latex paint and used oil, which are regulated but non-hazardous wastes.

## LAND USE & TRANSPORTATION

### NATURAL AREA PRESERVATION

The City of Hallandale Beach does not have extensive areas of undeveloped land or natural areas. However, the City does have extensive marine ecosystems, including lakes, estuarine areas, and the Intracoastal Waterway.

The Coastal Management and Conservation elements of the City's Comprehensive Plan establish objectives, goals and policies designed to protect natural resources. Notable objectives include: preserving the hazard mitigation system of dunes with native coastal vegetation, reducing stormwater pollutants, protecting manatees, and encouraging drought resistant/native vegetation through landscaping guidelines.

Hallandale Beach has been a certified Tree City USA, through the Arbor Day Foundation, for 26 years. Tree canopy is limited due to the intensive development in most of the City. The tree canopy should be increased to meet the 30% citywide coverage by 2030 goal set by the Broward League of Cities and adopted by Hallandale Beach. The current tree canopy percentage is not known, but the 2008 Citywide Masterplan and Implementation Strategy indicated it was very low. The City has a Street Tree Planting program, which should receive additional funding, and a Tree Preservation Ordinance.

Hallandale Beach is registered as a Community Wildlife Habitat by the National Wildlife Federation. This program requires cities to establish wildlife habitats at homes, schools and common areas; establish sustainable gardening practices; and educate citizens.

Due to the intensive development of the area, there are no threatened or endangered species habitats in Hallandale Beach; however manatees, bald eagles, and/or loggerhead turtles could potentially utilize marine/coastal environments in the City. The City's municipal code includes provisions to protect nesting sea turtles from artificial light sources on new coastal construction. The City was home to 31 turtle nests during the 2017 season.

### OPEN SPACES, PARKS AND RECREATION

Hallandale Beach has about 108 acres of public parks and open space, and about 143 acres of public waterways. Broward County's Land Use Plan requires a level of service (LOS) standard of 3 acres of parks/open space per 1,000 residents. Including public waterways, Hallandale Beach's parks and open space exceed this standard by 144%. The City's CP acknowledges that parks and open space are not uniformly distributed, limiting some citizens access. In addition, public waterways are not generally accessible. As a result, the City continues to look for opportunities to both enhance existing facilities and add to its inventory. A proposal to increase the City's LOS to 4 acres/1000 residents and reduce the acreage of waterways that contribute towards this goal is currently before the City Commission. The goal is to develop an impact fee that will help the City purchase land for open space.

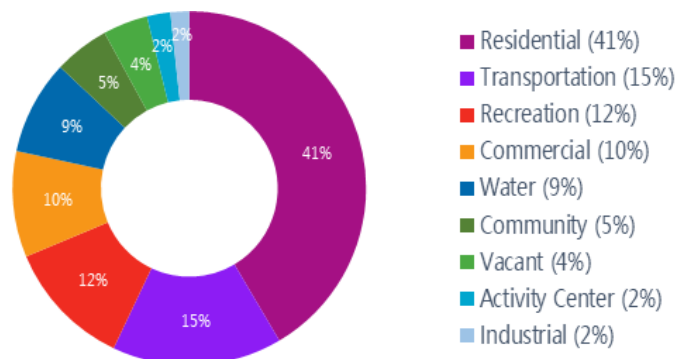
The City manages open spaces, parks and recreation according to its City Wide Parks Master Plan, which identified recreational needs, maximized use of current assets, and improved access to facilities. The plan guides investment of a \$58.5 million general obligation bond approved by the voters to improve existing parks and develop new facilities. The Administration has committed to having all of the parks under construction or completed by the end of FY19/20.

The largest investment is the Peter Bluesten Park. The park is designed to be the City's premiere civic space, integrating a government center, the Villages at Gulfstream Park, and a future multimodal transportation station into a new town center. The center will promote pedestrian-oriented, mixed-use, sustainable development. Plans to incorporate the Post Office are in development.

### DEVELOPMENT AND REDEVELOPMENT

The City of Hallandale Beach is compact and largely built-out with minimal existing land use vacant. The predominant land use is residential, with significant portions devoted to transportation, recreation, commercial and water (Figure 6).

FIGURE 6: CITY OF HALLANDALE BEACH LAND USE DISTRIBUTION



The City's high-density nature lends itself to sustainability. In dense urban environments, economies of scale allow fewer resources to be used per capita, while multi-family housing, public transportation and other mobility options save energy and fuel. However, according to the City's 2009 Citywide Master Plan pedestrian spaces do not receive equal importance to vehicular space; the city lacks a distinct center, as do its neighborhoods; land uses are separated; development does not engage the street; demand for recreational space exceeds supply and water access to lakes and canals is limited.

Accordingly, the goals and recommendations of the Master Plan emphasize directing redevelopment of the City towards a pedestrian-oriented, mixed-use and sustainable form. Specific recommendations include establishing a town center around the redesigned Bluesten Park (see Open Spaces, Parks and Recreation), creating a system of pedestrian networks and multimodal roadways, improving waterfront access and revising policies and regulations to reinforce these stated City goals. It is important to note that both the Village of Gulfstream Park and the Mardi Gras Casino are undergoing a master plan development process and a change in ownership, respectively. This opens a very important window to readdress the SAP's goals as the transitions unfold.

The goals and recommendations of the Master Plan are largely consistent with the goals, objectives and policies of the City's CP dated 2007, but amended regularly. The CP emphasizes mixed-use development supportive of multimodal transportation throughout its future land use, transportation, housing and conservation elements. It has established a Local Activity Center coincident with the Village at Gulfstream Park and a Regional Activity Center between Dixie and Federal Highways, extending one block north east of Federal Highway and Hallandale Beach Boulevard in which land use is explicitly directed towards these goals. In these areas, the City's zoning has entitled significant increases in density.

The role of a revitalized and energized Community Redevelopment Agency (CRA) should not be ignored in reaching the SAP goals. The CRA will soon embark on creating a plan to determine outcomes through the completion of a 30-year life cycle. The goals of the SAP should be embedded in that vision.

### LAND USE REGULATION

The City implements its vision for redevelopment and existing land uses, including its zoning and land development codes, through its CP and its code of ordinances.

While sustainability goals, objectives and policies occur throughout the CP, most of these are collected in the Conservation Element. These include water conservation, protection of natural areas, in particular beach dunes and vegetation; and restoration of native coastal vegetation.

The City's Development Service Department implements land use regulation. In the City's 2017-2019 Strategic Plan, the Department has committed to developing a new element of the CP dedicated to preparing for climate change. This follows on recently proposed amendments to the Coastal Management Element, including goals to reduce the City's Community Rating System (CRS) score (see Community Rating System (FEMA)); identify vulnerabilities to sea level rise; develop adaptation strategies in collaboration with the County and the Southeast Florida Regional Climate Change Compact; and establish Adaptation Action Areas (AAAs) within the City. AAAs designate areas susceptible to flooding and thus are vulnerable to the related effects of sea level rise for the purpose of prioritizing funding for planning and infrastructure.

The Future Land Use Element of the Comprehensive Plan includes both the Local Activity Center Land Use Category and the Regional Activity Center Land Use Category. Within these categories, compact, mixed-use development supplemented by recreation and open space is specifically encouraged. These concepts are reinforced by Land Development Regulations which focus on transforming Hallandale Beach into a walkable community through the implementation of zoning codes which dictate minimum densities, scalable buildings, build-to lines, connecting grid pattern streets, and other features focused more on the form of the built environment and less on segregating uses from one another. This portion of the City's Zoning Regulations – known as the Form-Based Code – applies along Federal Highway and a small portion of Hallandale Beach Boulevard. Expansion of the Form-Based Code to additional areas of the Hallandale Beach Boulevard corridor is under consideration.

Form Based Codes are a zoning innovation that regulates the physical form rather than the use of development. By controlling the relationship between buildings and streets, regulating the size and form of buildings as well as the scale of streets and blocks, Form Based Codes have the potential to more directly foster sustainable urban environments.

## GREEN BUILDING CODE

“Green Building” refers to an integrated process of infrastructure planning, design, construction and operations that is economical, socially and environmentally responsible throughout the life cycle of the building.

The City has adopted standards for new construction/major renovation of residential buildings and certain commercial buildings. It has not adopted standards for civil infrastructure, landscapes or existing buildings. This is an opportunity that requires further consideration.

All new City buildings must receive green building certification from a recognized third-party. These include rating systems administered by the U.S. Green Building Council (LEED), the Green Buildings Initiative (Green Globes) and the Florida Green Building Coalition.

The City's Land Development Code requires all commercial new construction or major renovations greater than 50,000 gross square feet, all residential/hotel new construction or major renovation greater than 50 housing/hotel rooms; any projects requiring flexibility or reserve units; and any project requesting financial assistance from the City's Community Redevelopment Agency receive green building certification. All green building projects should receive expedited permitting review and approval although given high demand this goal is very difficult to achieve. The City has also committed to at least one training workshop per year related to green building.

In the 2017-2019 Strategic Plan, the City's Office of Capital Improvements commits to ensuring that all eligible capital improvement projects achieve a minimum LEED Silver. Currently there are at least four buildings in the City that have achieved green building certification, two of which are City facilities (Foster Park and BF James Park).

Several developments are in progress that are expected to comply with the City's Green Building Program, including three new City facilities (OB Johnson Park, Main Fire Station 7 and Bluesten Park).

## TRANSPORTATION PATTERNS

Transportation in Hallandale Beach – like most places – is dominated by automobiles. County-wide, the share of travelers using automobiles is 98.9%, according to the Comprehensive plan. Traffic congestion on City roads is the greatest concern for citizens. Travel on the City's main thoroughfares, Hallandale Beach Boulevard, Pembroke Road and US-1/Federal Highway is highly-congested. The City is investigating roadway improvements that will provide for the use of traffic signal prioritization to enhance flow along congested thoroughfares. The City is also preparing a Mobility Plan which will address traffic and related issues, including a funding source to address the problem. Tri-rail operates a rail system with a station in nearby Hollywood. However, the CP acknowledges that it is not readily accessible to citizens. A commuter rail station has been proposed near Bluesten Park at the Florida East Coast Railway (FEC) tracks, with a bus service link to nearby Tri-Rail stations. This would provide an important opportunity to catalyze use of transit as well as economic development in the City.

In Hallandale Beach, about four percent of travelers use mass transit – higher than the County average of little more than one percent. Buses account for the majority of use. The City is served by both Broward County and Miami-Dade bus systems, providing access to the wider region. The City also provides a free Community Bus that provides transportation along four routes within the City, centered informally on the government center. It also provides connections to regional transit.

The CP notes that bicycling is common throughout the City. According to the MMP the City has a functional but incomplete grid of bicycle infrastructure. Walking is also common within the City. A city-wide network of sidewalks is desirable, particularly within neighborhoods. There are gaps in connectivity between neighborhoods, transit and commercial development along major corridors.

The transportation element of the comprehensive plan acknowledges a tension between the City's efforts to increase density and mixed-uses along key corridors and traffic congestion. To create a balance, the Mobility Plan will recommend measures to reduce congestion through roadway improvements and developing alternatives to automobiles.

Through the transportation element of the CP, the City has adopted vehicle miles traveled (VMT) reduction targets (CP, Transportation Element 1.3.11) and is working with the County to promote ridesharing, telecommuting and transit to meet the goals. The element also commits the City long term to the community bus system as well as funding bicycle and pedestrian improvements. This is reflected in the strategic plan, which includes goals to: increase Community Bus ridership; ensure that all City facilities are well connected and provisioned for pedestrians; and provide safe infrastructure and environments for pedestrians.

The City's mobility plan will include many recommendations and projects for enhancing mobility in Hallandale Beach. Many projects and funding sources will be identified, including: Level of Service (LOS) standards for bicycling and pedestrian infrastructure; new or improved bicycle/pedestrian paths; enhancements to the Community Bus System; and development of the Tri-Rail Coastal Link station. There will also be recommendations relating to resiliency of the City's road system related to sea level rise and more severe storms due to climate change.

## NATURAL RESOURCE & RESILIENCY

### WATER USE

Two wells located in the northwest of the City supply Hallandale Beach with water. The wells are permitted by SFWMD with an expiration date of December 16, 2033 (Permit #06-00138-W). The permit authorizes withdrawals serving a portion of the demand for 41,911 persons through the year 2033 with an average per capita use rate of 179 gallons per day and an annual allocation of 1,277 million gallons. The City's South Florida Water Management District permit allows it to draw 3.5 MGD from existing wells.



This allocation is supplemented by water from Broward County wells to bring the total allocation to ~5.5 MGD. Demand in Hallandale Beach is projected to reach 5.60 MGD by 2035. The City's current permit is valid until 2033 and it is not clear at this time if the City's allocation will be increased to meet demand in the future. Therefore, it is imperative that the City implement water conservation, reduction and reuse programs to prepare for this future uncertainty.

The City is also supplied with well water from Broward County's South Regional Well Field located in southwestern Broward County. Currently, the City's water supply is drawn from the Biscayne Aquifer. In emergencies, an interconnect with the City of North Miami Beach allows Hallandale Beach to purchase water through interconnected water mains. This water is very expensive. However, an emergency backup is critical to have available.

Saltwater intrusion related to sea level rise is affecting the aquifer over 2.5 miles inland from the coast, adjacent to the two city wells<sup>9</sup>. In the future, the City may need to draw water from the Floridan Aquifer, or from the proposed C-51 Reservoir project in Palm Beach County.

### COMMUNITY RATING SYSTEM (FEMA)

The Community Rating System (CRS) is a voluntary program for National Flood Insurance Program (NFIP) participating communities. CRS provides insurance rate incentives to: reduce flood damages to insurable property; strengthen and support the insurance aspects of the NFIP; and encourage a comprehensive approach to floodplain management.

There are 10 classes in the CRS, with lower numbers corresponding to higher discounts. For CRS participating communities, flood insurance premium rates are discounted in increments of five percent (i.e., a Class 1 community would receive a 45% premium discount, while a Class 9 community would receive a five percent discount (a Class 10 is not participating in the CRS and receives no discount)). The CRS classes for local communities are based on 18 creditable activities, organized under four categories:

- Public Information
- Mapping and Regulations
- Flood Damage Reduction
- Flood Preparedness

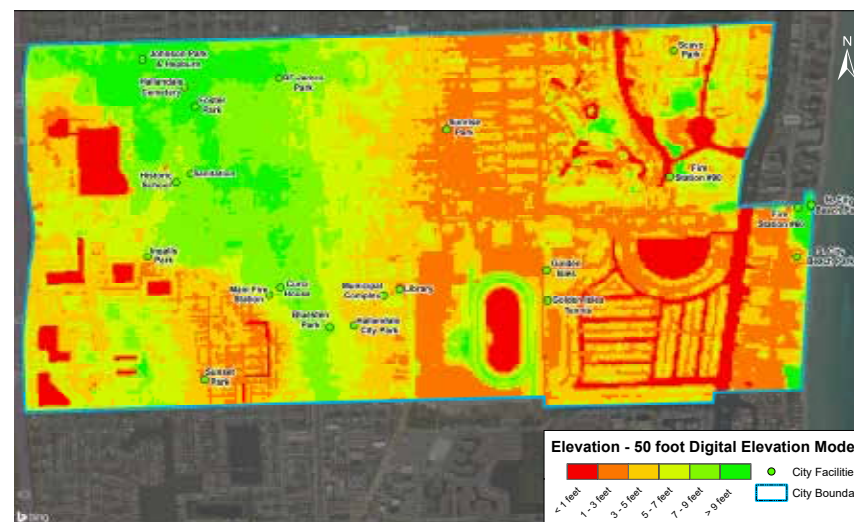
The City of Hallandale Beach was the first community in Broward County to secure a Class 6 CRS rating, which provides 20% reduction in rates for properties located within the flood zones and 10% reduction for properties outside the flood zone. Annual savings to residents and businesses were \$1,078,863 in 2014. If the City were able to improve its rating to Class 5, residents and businesses would benefit from a 25% reduction in insurance premiums. (From 2014 –June 4, 2014 City Commission Meeting Minutes). In 2016, the City passed an Ordinance establishing special elevation requirements for construction within flood hazard areas. As of April 2017, Hallandale Beach retained its Class 6 Rating, while Broward County as a whole had a Class 7 Rating. Achieving the Class 5 rating is a major goal of the SAP.

In 2014, Hallandale Beach Businesses and Residents had 17,646 Policies under the National Flood Insurance Program (NFIP), totaling over \$3 billion in coverage. From 1978 to 2014, there were 1,290 claims paid in the City, totaling over \$24 million. Total claims paid since 1978 were the second-highest by population among cities in Broward County, at approximately \$634/capita. This is due to our high population density.

### HISTORICALLY VULNERABLE AREAS (FLOODING AND SHORELINE EROSION)

Hallandale Beach's proximity to the Atlantic Ocean and the Intracoastal Waterway comes with a risk of flooding from sea level rise and storm surge. The mean elevation in the City is 5.11 feet above mean sea level (MSL). Approximately 30% of the City is below three feet in elevation, and about 59% is below 5 feet. The highest areas of the City are predominantly in the northwest quadrant, west of Northeast 1st Avenue and north of SW 3rd Street. With the exception of a few areas of higher ground near Fire Station 60, Three Islands, and the Diplomat Country Club, most of the City east of Highway 1 is low-lying. Figure 7 shows a digital elevation model of Hallandale Beach at 50 foot resolution.

FIGURE 7: CITY OF HALLANDALE BEACH ELEVATION ABOVE SEA LEVEL



The City's CP, Land Use Element, Objective 2.2 states "The City shall direct populations away from High-Hazard Areas (HHAs) in concert with the established hazard mitigation strategies developed by Broward County. These areas correspond to Zone VE on FEMA's Federal Flood Insurance Rate Map (FIRM). Zone VE is defined as an area inundated by flood with a one percent annual chance of occurring and with a velocity hazard due to wave action. In Hallandale Beach, Zone VE areas are located along the coast east of S. Ocean Drive/ A1A. The City requires minimum elevations for the first floor of new construction sites to exceed the 100-year still-water and wave-action base flood elevations shown in the FIRM for the City.

The City's Comprehensive Emergency Operations Plan (CEOP) governs the City's response to a hurricane or other disaster. The CEOP, which has recently undergone a major update, indicates areas east of the Intracoastal Waterway are vulnerable to storm surges during all hurricanes and should be evacuated and areas east of Federal Highway should be evacuated in Category 3 or higher storms.

## STORM SURGE AND EVACUATION

### PROBABILITY OF A MAJOR STORM

The City of Hallandale Beach is a coastal city in a region that is vulnerable to tropical storms and hurricanes. Broward County experienced 22 hurricane strikes from 1900 – 2010, 12 of which were major hurricanes. NOAA estimates there is a four percent probability of a Class 3 or greater hurricane strike in the region in any given year. Storm frequency and severity are projected to increase as a result of global climate change, potentially increasing the probability that Hallandale Beach will experience a major storm in the future. While gusts achieved hurricane strength, Hurricane Irma in 2017 sustained winds less than 74 mph winds in Broward County, technically a very strong tropical storm – not a hurricane.

### EVACUATION

Sections of Ocean Drive (A1A), a designated evacuation route, could be underwater under a two foot sea level rise (SLR) scenario. This could potentially impact efforts to evacuate parts of Hallandale Beach ahead of a hurricane or other natural disaster. This means our system of notifying residents needs to be improved, including the use of additional languages such as Spanish and Russian. The City implemented this during Hurricane Irma with great success.

### STORM SURGE

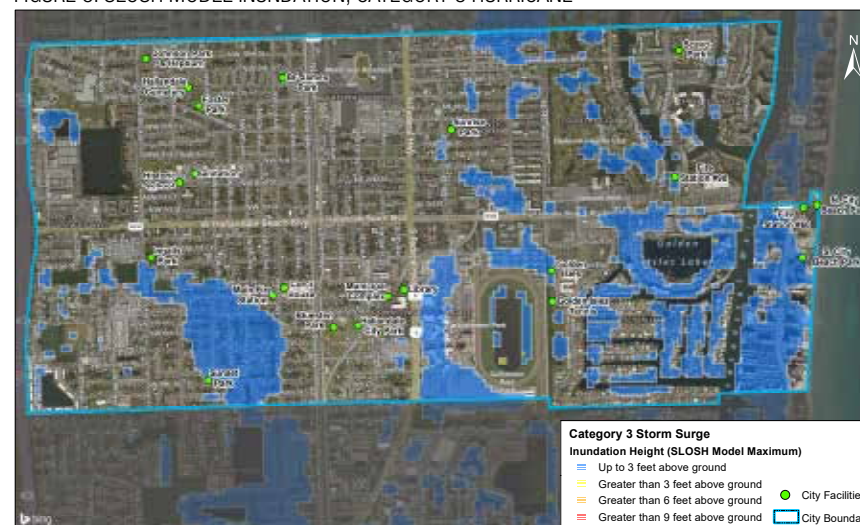
Storm surge is an abnormal rise of water generated by a storm, over and above the predicted astronomical tides. In coastal areas, storm surge is often the greatest threat to life and property from a hurricane. Storm surges can reach heights of 30 or more feet and extend many miles inland from the coast. Storm surges travel further inland in areas with low elevation and a shallow continental shelf, such as the southeast coast of Florida.

The Sea, Lake, and Overland Surges from Hurricanes (SLOSH) Model, which was developed by the Federal Emergency Management Agency (FEMA), United States Army Corps of Engineers (USACE), and the National Weather Service (NWS), predicts storm surge impacts to communities. The model estimates storm surge depths resulting from hypothetical hurricanes. SLOSH is based on probabilistic approaches and multiple model runs of hypothetical hurricanes with different storm conditions. It is not a worst case scenario, as there is about a 1 in 10 chance that storm surge flooding at any particular location could be higher than the values shown. SLOSH is able to resolve flow through barriers, gaps, and passes and models deep passes between bodies of water. It also resolves inland inundation and the over topping of barrier systems, levees, and roads<sup>10</sup>.

NOAA SLOSH maps indicate Hallandale Beach could experience flooding from a Category 1 or 2 storm. In September 2017, the City experienced a storm surge of one to two feet from Hurricane Irma, then a Category 1 storm. Surge depths were similar to those predicted by the SLOSH model.

A Category 3 or above storm could cause extensive flooding up to three feet above ground level in Hallandale Beach, affecting areas near S. Ocean Drive, Golden Isles, Gulfstream Park, and north of Sunset Park. A Category 4 or 5 storm could flood more than 50% of the City's area, with flood depths of six feet or greater in some areas. In the future, SLR may increase the effects of storm surge. Figure 8 shows predicted SLOSH Model inundation from a Category 3 hurricane impacting Hallandale Beach, based on current sea levels.

FIGURE 8: SLOSH MODEL INUNDATION, CATEGORY 3 HURRICANE



### STORM EVENT AND SEA LEVEL RISE PROJECTIONS

The Southeast Florida Regional Climate Change Compact's Unified Southeast Florida Sea Level Rise Projection projects SLR between 6-10 inches by 2030 and between 14-26 inches by 2060, based on a 2010 baseline.

Parts of Hallandale Beach are included in Broward County's Priority Planning Areas for sea level rise, adopted in December 2015. These are areas near tidal water bodies at increased risk of inundation under a two foot sea level rise scenario, projected to occur as soon as 2060.

## INFRASTRUCTURE AND NATURAL RESOURCE RESILIENCY STATUS

### INFRASTRUCTURE

The 2013 City of Hallandale Beach Vulnerability to Sea Level Rise Assessment Report identified major municipal infrastructure at risk of inundation under one and two foot SLR scenarios.

Under one foot of SLR scenario, the report found minor impacts to vulnerable infrastructure including to arterial roads around the Municipal Center / Police Station and limited flooding of approximately 5 acres or less throughout the City.

Under a 2 foot SLR scenario, the report found up to 72 acres could be inundated throughout the city. Inundated streets could limit access to City Hall and the Police department. Two City parks, and Fire Station #60 (located at 2801 East Hallandale Beach Boulevard) would also have limited access and/or flooding under this scenario.

The Hallandale Beach Community Redevelopment Area (CRA) includes areas with elevations at or below sea level during both the one and two foot scenarios. In addition, bridge clearance would be affected under both scenarios.

It is important to realize these findings are based on SLR alone and do not factor in flooding which could occur from the additive effect of SLR and storm surge during extreme weather events.

The City does not currently track renovation of public facilities to improve resiliency. In future, the City plans will take the Unified Sea Level Rise Projection into account when upgrading sewage pump stations.

### NATURAL RESOURCES

The City of Hallandale Beach does not have any regional parks or nature centers, and predominately consists of developed land. The City does not have any extensive natural areas or features that could mitigate the effects of SLR or storm surge (i.e. mangroves, marshes, coastal barrier islands, etc.). This possibility exists for the Chaves Lake park development program. The park design will begin in 2018, subject to the results of the Phase I and II pollution reports currently underway.

According to the “Resilience Dialogues Final Synthesis Report” prepared for Hallandale Beach by the Institute for Sustainable Communities, Saltwater intrusion is already affecting the aquifer over 2.5 miles inland from the coast, adjacent to two city wells. Saltwater intrusion can have deleterious effects, including contamination of private fresh water wells, elevation of the water table leading to septic system failure, structural damage to building foundations, and negative effects on landscaping/vegetation.

Sea level rise may cause the water table to rise, reducing soil storage capacity in some areas. Broward County’s Future Conditions Average Wet Season Groundwater Elevation

Map models sea level rise and precipitation impacts related to climate change to project wet season groundwater elevations during the years of 2060-2069. Projected contours in Hallandale Beach show between 1.5 and 0.0 feet North American Vertical Datum (NAVD), the vertical control datum of orthometric height established for vertical control surveying, indicating groundwater will be just below the land surface in many locations. The change in groundwater depth has the potential to exacerbate the flooding impacts of extreme precipitation, which are expected to become more frequent as a result of climate change.

## EDUCATION & OUTREACH

### COMMUNITY OUTREACH AND GREEN MARKETING

The City of Hallandale Beach is actively engaged in both outreach towards residents and internal engagement of staff regarding its Green Initiatives and resilience initiatives. The Green Initiatives Program ([cohb.org/green](http://cohb.org/green)) is featured on the City’s website, with pages on understanding climate change, recycling, water conservation, and best management practices (BMPs) for pesticide, herbicide, and fertilizer use. In addition, the City promotes its Green Initiatives through newsletters, signage, programs workshops, and festivals. A Sustainability Tools for Assessing and Rating Communities (STAR) feasibility assessment has been prepared as part of the Sustainability Action Planning process. Achieving STAR Certification will result in valuable recognition and publicity as well as demonstrable positive financial outcomes for the City’s Green Initiatives Program. Table 2 shows some of the City’s existing external outreach efforts.





TABLE 2: GREEN INITIATIVES OUTREACH EXAMPLES (EXTERNAL)

Outreach Effort	Description
Green Initiatives Newsletter	Hallandale Beach's quarterly Green Initiatives Newsletter educates residents about the City's sustainability efforts and highlights programs, workshops, initiatives and incentives.
Hallandale Happenings	The official Hallandale Beach newsletter, typically features one article related to the City's Green Initiatives and programs each quarter.
Sea Level Rise Awareness Poles	Six sea level rise (SLR) awareness poles are installed at beach access locations. The poles visually show what the impacts of SLR will be in the community and contain information about climate change, SLR impacts and ideas to reduce GHG emissions.
Water Conservation Program	Offered in partnership with Broward County, the Program features rebates to incentivize residents to replace toilets for more efficient models, and also provides free low-flow fixtures to residents. The Program is promoted on the City's website and through community workshops.
Water Conservation Month	The City designated April 2017 "Water Conservation Month" to raise awareness about the importance of water conservation.
Energy Conservation Program	The Program provides free high-efficiency LED light bulbs and smart power strips to residents to lower energy consumption.
Youth Beach Clean Up Program	The Program hires area youth to clean up the beach and educates them about marine debris hazards and pollution. Program includes a baseline knowledge assessment and follow-up survey. Youth team members also provide education and outreach to beach goers.
WaterWise	The Water Wise Educational Program promotes water conservation in schools, with an estimated ~75,000,000 gallons saved from 2008 to 2014. The program includes classroom instruction, problem-solving activities, and a take-home kit with high efficiency water saving devices the students can install at home.
Green Fest	The Annual Green Fest features workshops, vendors, giveaways, games, document shredding, and the Trashion Show (a fashion show to raise awareness about waste/recycling).
Zero Waste Workshop	The Workshop educated residents about the principles of Zero Waste, the hazards of marine debris, the City's recycling Program, and home/health do-it-yourself products to help residents save money, improve health and reduce their impact.
Rain Barrel and FL Friendly Plants Workshop	The Workshop provided information about water conservation, Florida native and drought-tolerant plants, and the construction and use of rain barrels to attendees.
We-Lab Workshop	The Workshop implemented water & energy saving behaviors to save money and foster sustainability.

The City's education and outreach efforts are coordinated by the Green Initiatives Coordinator. Although the City provided many examples of communications and outreach efforts in a variety of media, a formal Communications Plan identifying audience, media, messaging, goals and strategies should be developed. The City tracks social media engagement for its accounts on Facebook, Twitter and Instagram. To date, Hallandale Beach has no comprehensive strategy for public outreach related to sustainability, and has not marketed the City as a green tourism destination or green business community.

### INTERNAL ENGAGEMENT

The City set a FY16/17 goal of presenting a Green Initiatives Program Overview during all new full-time employee orientations. The program would provide an overview of sustainability and climate change, and familiarize new employees with the City's green initiatives, including the recycling program, water conservation program, home energy efficiency program, and public events/workshops. This program has not yet been rolled out due to delays and necessary coordination with Human Resources. With the adoption of the SAP, the rollout will be completed during FY18/19.

In 2016, the Green Initiatives Coordinator and Fire Department staff conducted a recycling audit to identify recyclable materials in their waste stream. Six audits were performed in total – three prior to staff training sessions and three after. 41 staff members attended training and the re-audit showed a 44% increase in the Fire Department's recycling rate. Recyclable commodities found included: office paper; handouts/pamphlets/flyers; magazines; cardboard boxes; plastic bottles; post-it notes and aluminum cans. As part of the audit process, the Fire Department developed a Recycling Program Policy to guide its employees in waste minimization and recycling.

### FUNDING & EVALUATION

#### FUNDING

Funding for sustainability initiatives in Hallandale Beach currently derives from a variety of sources. These sources can also fund future sustainability initiatives for the City.

The City's park and open space improvements are funded by a \$58.5 general obligation bond.

Broward County's Transportation Management Concurrency System (TCMA) collects impact fees from development that affects roads within the City under its jurisdiction. These funds are invested in transit improvements within a district that includes Hallandale Beach. Similar to the TCMA, the City requires mitigation for development affecting local roads. Fees can be collected via Developer Agreements that demonstrate a nexus between the fee and the mitigation.

The City's General Fund was nearly \$62 million in 2016 and consists of Ad Valorem property taxes, fees for service, permitting fees, utility taxes and franchise taxes. Fees collected by the City are various, ranging from plan review fees to day camp fees. General funds can be directed towards sustainability projects and personnel, such as the City's Green Initiatives Coordinator. Fees could potentially be crafted to incentivize sustainability outcomes and generate revenues for sustainability projects.

Other potential City sources of funding for sustainability projects include the Transportation Fund, which includes proceeds from the local option gas tax (about \$1 million in 2016) and the Utility fund (\$22 million in 2016), which includes revenues from the City's water utility. The City's water utility actively promotes water conservation activities among customers as well as reuse of non-potable water for uses such as irrigation.

Grants and rebates are another source of funding for sustainability projects. Grants may be available at all levels of government (Federal, State, and Local). Examples include a State of Florida Department of Economic Opportunity grant that is funding Form Based Code

development in the City. Rebates were recently available from the State of Florida for the purchase of natural gas vehicles, such as the City's CNG refuse trucks.

Public-Private Partnerships provide private capital for sustainability projects. An example is the City's Energy Savings Performance Contract, which invested about \$5.5 million in energy and water improvements in the City's facilities.

## EVALUATION

The City utilizes a Strategic Plan to establish a shared mission and vision for the City. It sets priorities that are supported by specific initiatives. These initiatives, in turn, include performance measures to monitor and evaluate improvement. Staff is held accountable for achieving strategic commitments. The strategic plan includes priority areas related to sustainability that include metrics. These initiatives are detailed in the preceding sections.

The City's Sustainable Initiatives Coordinator monitors City operations and identifies opportunities to promote sustainability throughout the City. This includes working closely with staff to obtain and evaluate relevant data. As evidence of this, the comprehensive information necessary for this Sustainability Planning effort was collected quickly and thoroughly. However, the City does not yet systematically track and evaluate key sustainability performance indicators related to its focus areas. Additionally, the City lacks a comprehensive, centralized database to track sustainability performance. This need will be met with the adoption of the SAP.



## BENCHMARKING

No two cities are alike. As unique as its citizens, a city is the unpredictable result of its own history, demographics, geography, culture, and politics, among many other factors. Because of these differences, it can be difficult to compare sustainability progress between local governments without a suitable evaluation framework.

The STAR Community Rating System (STAR) is the nation's first voluntary, self-reporting framework for evaluating, quantifying, and improving the livability and sustainability of U.S. communities. It facilitates meaningful comparisons of cities' sustainability performance. The framework addresses social, economic and environmental dimensions of the community. It is premised on a framework of sustainability goals, objectives and evaluation measures. Local leaders can set goals and measure progress across sustainability themes using the evaluation measures included in the Rating System. Within the Goals and Objectives, specific Best Management Practices, or "actions" are included such as regulatory changes, land acquisitions, policy innovation, or specific actions such as increasing access to transit.

STAR rates communities on a 5-point scale and awards leadership certifications for three, four and five star ratings. Each rating is good for four years before recertification is required. Most communities first achieve a 3-STAR rating and then work to improve their score over time. Certified STAR communities are part of a select group. Currently, there are close to 30 3-STAR communities nationwide, and five in Florida, including Monroe County, the City of St Petersburg, and the Village of Pinecrest. Broward County and West Palm Beach are currently the only 4-STAR communities in Florida, and there are only four 5-STAR communities nationwide.

There are many benefits to STAR certification. STAR certification typically attracts media attention and helps communities communicate the value of their sustainability programs to the public and other stakeholders. It also allows them to compare their progress against other STAR communities. Through the certification process, communities gather data about

environmental, social and economic initiatives, establish goals, and demonstrate the ability to transparently track their progress. They also have the opportunity to learn from and adopt best management practices inherent in the STAR framework. STAR allows each community to find a route to the desired certification level that meet its own needs and priorities.

### BENCHMARKING PROCESS

In collaboration with Hallandale Beach's Green Initiatives Coordinator, the City's consultant used STAR as a tool to benchmark the City's sustainability performance relative to three peer local governments. This approach yielded multiple benefits. It provided an objective reference point for meaningful comparisons, revealed BMPs successfully implemented by peers, introduced City staff to STAR, and set the stage for the City's eventual STAR certification by establishing a preliminary STAR rating point score.

Three peer local governments were selected. In Florida, Broward County and the Village of Pinecrest are geographically close to Hallandale Beach, sharing a similar climate, coastal environment, urban character, and regulatory landscape. The third city, Park Forest, Illinois, is similar in population and demographics to Hallandale Beach. All three peers have previously achieved STAR certification.

RS&H evaluated STAR objectives related to the City's SAP focus areas for the benchmarking effort. Table 3 shows the STAR objectives RS&H evaluated (highlighted), while the remaining objectives were evaluated by the City's Green Initiatives Coordinator. As each objective was evaluated, it was entered into the STAR Crosswalk Assessment Tool to determine a preliminary STAR point score. The objectives evaluated were also compared (benchmarked) against the three peer local governments to assess the City's sustainability progress and identify BMPs applicable to Hallandale Beach.





TABLE 3: STAR OBJECTIVES INCLUDED IN BENCHMARKING ANALYSIS\*

Focus area and Objectives	
Built Environment	Equity & Empowerment
BE-1: Ambient Noise & Light	EE-1: Civic Engagement
BE-2: Community Water Systems	EE-2: Civil & Human Rights
BE-3: Compact & Complete Communities	EE-3: Environmental Justice
BE-4: Housing Affordability	EE-4: Equitable Services & Access
BE-5: Infill & Redevelopment	EE-5: Human Services
BE-6: Public Park Land	EE-6: Poverty Prevention & Alleviation
BE-7: Transportation Choices	Health & Safety
Climate & Energy	HS-1: Active Living
CE-1: Climate Adaptation	HS-2: Community Health
CE-2: Greenhouse Gas Mitigation	HS-3: Emergency Management & Response
CE-3: Greening the Energy Supply	HS-4: Food Access & Nutrition
CE-4: Energy Efficiency	HS-5: Health Systems
CE-5: Water Efficiency	HS-6: Hazard Mitigation
CE-6: Local Gov. GHG & Resource Efficiency	HS-7: Safe Communities
CE-7: Waste Minimization	Natural Systems
Economy & Jobs	NS-1: Green Infrastructure
EJ-1: Business Retention & Development	NS-2: Biodiversity & Invasive Species
EJ-2: Green Market Development	NS-3: Natural Resource Protection
EJ-3: Local Economy	NS-4: Outdoor Air Quality
EJ-4: Quality Jobs & Living Wages	NS-5: Water in the Environment
EJ-5: Targeted Industry Development	NS-6: Working Lands
EJ-6: Workforce Readiness	Innovation & Process
Education, Arts & Community	IP-1 Best Practices & Processes
EAC-1: Arts & Culture	IP-2: Exemplary Performance
EAC-2: Community Cohesion	IP-3: Local Innovation
EAC-3: Educational Opportunity & Attainment	IP-4: Good Governance
EAC-4: Historic Preservation	
EAC-5: Social & Cultural Diversity	
EAC-6: Aging in the Community	

\* Highlights indicate STAR Objectives evaluated by RS&H, remaining objectives were evaluated by the City of Hallandale Beach. The informal STAR self-assessment included as a part of the SAP evaluated all 526 indicators included in the STAR program.

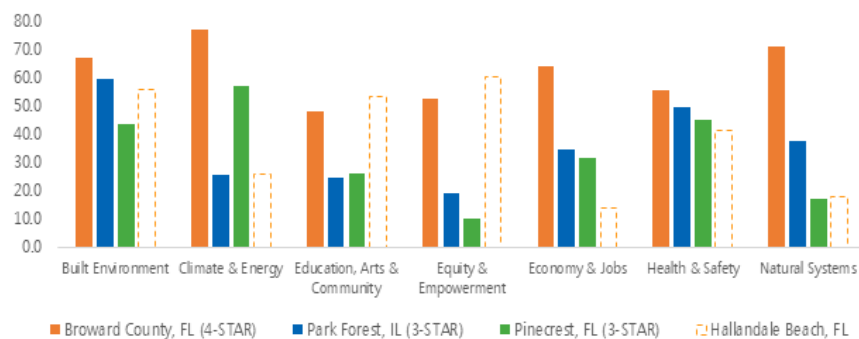
## BENCHMARKING RESULTS

Benchmarking results show Hallandale Beach should be able to achieve a 3-STAR rating and demonstrate similar sustainability leadership to Pinecrest and Park Forest. Table 4 shows the City's projected STAR point score for each focus area. Figure 9 shows the City's projected STAR points compared to the actual STAR ratings achieved by the peers for each STAR goal area. Note that STAR point scores must be verified by a STAR reviewer. Scores are typically revised downwards 10-20 percent or more during this process. A minimum of 250 points are required to receive a 3-STAR rating.

TABLE 4: HALLANDALE BEACH PROJECTED STAR POINT SCORE

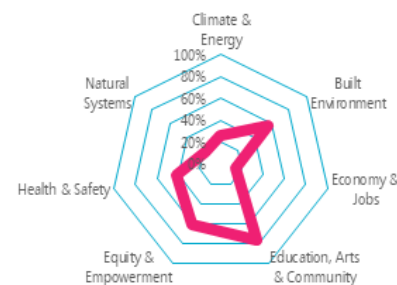
Goal Area	Score	% Complete
Built Environment	56	56%
Climate & Energy	26	26%
Education, Arts & Community	53	76%
Equity & Empowerment	60	60%
Economy & Jobs	14	14%
Health & Safety	41	41%
Natural Systems	18	18%
Total	269	37%

FIGURE 9: STAR POINT SCORE BY GOAL AREA



Analysis of the City's projected STAR point scores shows the relative strength of its performance in each STAR goal area. Figure 10 shows Hallandale Beach performs relatively well in Education, Arts & Community, Equity and Empowerment, and Built Environment. The City performs less well in the Climate & Energy, Economy & Jobs, Health & Safety, and Natural Systems goal areas.

FIGURE 10: HALLANDALE BEACH'S PROJECTED PERFORMANCE IN EACH STAR GOAL AREA



Two public workshops were held during the course of development of the SAP. The first was held November 4th, 2017 at the Hallandale Beach Cultural Center. The second was held on November 18th at Foster Park Community Center.

The purpose of the workshops was to update citizens on the City's ongoing green initiatives, inform them of the City's baseline sustainability performance (as documented in the Baseline and Benchmarking Appendices) and solicit input on the goals and projects of the SAP.

Over 20 citizens participated in the events, as did the City's Mayor, City Manager and Green Initiatives Coordinator. Citizens participated in an activity based on the City's performance relative to the STAR Community Rating System (as documented in the Benchmarking Appendix). They evaluated and prioritized 154 potential actions to enhance the City's standing relative to this tool. Their priorities are shown in Table 5. The table includes the STAR Communities Rating System objective, action, goal area and criterion most favored by workshop participants.

TABLE 5: HALLANDALE BEACH PROJECTED STAR POINT SCORE

Objective	Action	Goal Area	Criterion
Increase funding in green infrastructure	Green Infrastructure	Natural Systems	NS-1:A-7
Adopt a bicycle and pedestrian master plan	Transportation Choices	Built Environment	BE-7:A-1
Establish water quality regulations	Water in the Environment	Natural Systems	NS-5:A-2
Full-day kindergarten for low-income & special needs children	Educational Opportunity & Attainment	Education, Arts & Community	EAC-3:A-5
Multiple pathways to secondary school graduation	Educational Opportunity & Attainment	Education, Arts & Community	EAC-3:A-7
Adopt a poverty reduction plan	Poverty Prevention & Alleviation	Equity & Empowerment	EE-6:A-1
Achieve Bicycle- or Walk-Friendly designation	Active Living	Health & Safety	HS-1:A-6

Several of these priorities were directly incorporated into the SAP. These include the Bikeshare, Build-out Bicycle and Pedestrian Infrastructure and Low Impact Development projects.





On the following pages, a detailed management plan is provided for each projected included in the SAP. Included for each project is the following information:

- Identifying information, including project ID, name, SAP focus area and year of establishment.
- The responsibility for the project, including the Project Manager (identified by role) and lead Department.
- Estimated performance metrics, including Net Present Value, Return on Investment and Project Life.
- The SAP focus area goal that the project contributes towards fulfilling, as well as an estimate of how much of this goal the project helps achieve (“Project Contribution”)
- A description of the project, including its objective, measures – including key performance indicators – that will be used to evaluate progress, actions required to implement the project, estimated cost and benefits and expected funding sources.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### RC1. LED STREETLIGHTS

#### PROJECT IDENTIFICATION:

Project ID: RC1  
Project Name: LED Streetlights  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$78,000  
Return on Investment: 58%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
*Project Contribution:* 12% of Focus Area Goal

#### PROJECT DESCRIPTION:

- Objective**
  - Measure(s)**
  - Action**
  - Cost(s)/Benefit(s)**
  - Funding**
- a. Objective: Reduce energy consumption of city street lighting by replacing existing lamps and fixtures with light-emitting diode (LED)s.
- b. Measure(s): Replace 100% of approximately 386 streetlights owned by the City.
- c. Action(s): Specify replacement of existing luminaires with LEDs with similar aesthetics and performance and install them. The delivery method must be determined (e.g. design/bid/build; performance contract, etc.). The city could procure the upgrades through traditional delivery methods (e.g. design / bid / build) or design-build methods. For purposes of estimation, this project is currently modeled with an upfront capital expenditure (e.g. design / bid / build).
- d. Cost(s)/Benefit(s): For purposes of estimation, costs are assumed to be \$500 per fixture based on vendor quote. It is assumed that installation occurs in years 1-3. Benefits: Benefits include avoided electricity consumption associated with the current, less efficient fixtures and lamps. An average project savings of 40% is projected. Average savings are assumed to occur in years 1 - 10. Savings include avoided maintenance costs based on a weighted average resource rate (\$0.16/kWh) sourced from historical FPL billings that include electricity and maintenance costs. Benefits do not include commercial energy efficiency rebates that may be available from FPL. Values are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2018 - 2027 for the Consumer Price Index.
- e. Funding: Funding is to be determined. The City will explore traditional and public-private partnership project delivery methods. The later would require no upfront investment on the part of the City.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### RC2. LED INTERIOR LIGHTING

#### PROJECT IDENTIFICATION:

Project ID: RC2  
Project Name: LED Interior Lighting  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$24,000  
Return on Investment: 41%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
*Project Contribution:* 11% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Reduce energy consumption of city facility interior lighting by replacing existing lamps with light-emitting diode (LEDs).
- b. Measure(s): Replace 100% of approximately 7,000 T8 fluorescent lamps with equivalent LEDs.
- c. Action(s): Specify replacement of existing luminaires with retrofit or replacement LEDs luminaires with similar aesthetics and performance and install them. It is expected that the city could specify, purchase and install retrofits with its own maintenance staff. Since lighting was upgraded in 2014 as part of a performance contract that stipulates that the City is responsible for maintenance of luminaires and fixtures, this project is scheduled to take place in 2021 and 2022, when the majority of the 2014 retrofit luminaires / fixtures will have failed. Alternatively, the City could begin retrofit / replacement as luminaires / fixtures fail now.
- d. Cost(s)/Benefit(s): For purposes of estimation, it is assumed that 25W T8 fluorescent lamps are installed in all City facilities at a density of 1.1 watts / sf. Given total office space of about 160,000 sf, costs are assumed to be about \$12 per lamp based on published prices for LED equivalent T8 lamps and a 15% markup for installation labor. Retrofit LEDs are currently rated at 17W. It is assumed that installation occurs in years 4-5. As noted above, retrofit / replacement could be accelerated to enhance the project's economic performance. Benefits: Benefits include avoided electricity consumption associated with the current, less efficient fixtures and lamps. An average project savings of 32% is projected. Average savings are assumed to occur in years 1 - 10. Savings do not include avoided maintenance costs, though these could be significant, since LED lamps may last 2-5 times longer than fluorescents. Benefits do not include commercial energy efficiency rebates that may be available from FPL. Values are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2018 - 2027 for the Consumer Price Index.
- e. Funding: To be determined.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### RC3. SOLAR THERMAL SYSTEMS

#### PROJECT IDENTIFICATION:

Project ID: RC3  
Project Name: Solar Thermal Systems  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$-21,000  
Return on Investment: -63%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
*Project Contribution:* 1% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Reduce energy consumption of city facility interior lighting by replacing existing lamps with light-emitting diode (LEDs).
- b. Measure(s): Replace 100% of approximately 7,000 T8 fluorescent lamps with equivalent LEDs.
- c. Action(s): Specify replacement of existing luminaires with retrofit or replacement LEDs luminaires with similar aesthetics and performance and install them. It is expected that the city could specify, purchase and install retrofits with its own maintenance staff. Since lighting was upgraded in 2014 as part of a performance contract that stipulates that the City is responsible for maintenance of luminaires and fixtures, this project is scheduled to take place in 2021 and 2022, when the majority of the 2014 retrofit luminaires / fixtures will have failed. Alternatively, the City could begin retrofit / replacement as luminaires / fixtures fail now.
- d. Cost(s)/Benefit(s): For purposes of estimation, it is assumed that 25W T8 fluorescent lamps are installed in all City facilities at a density of 1.1 watts / sf. Given total office space of about 160,000 sf, costs are assumed to be about \$12 per lamp based on published prices for LED equivalent T8 lamps and a 15% markup for installation labor. Retrofit LEDs are currently rated at 17W. It is assumed that installation occurs in years 4-5. As noted above, retrofit / replacement could be accelerated to enhance the project's economic performance. Benefits: Benefits include avoided electricity consumption associated with the current, less efficient fixtures and lamps. An average project savings of 32% is projected. Average savings are assumed to occur in years 1 - 10. Savings do not include avoided maintenance costs, though these could be significant, since LED lamps may last 2-5 times longer than fluorescents. Benefits do not include commercial energy efficiency rebates that may be available from FPL. Values are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2018 - 2027 for the Consumer Price Index.
- e. Funding: To be determined.





## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### RC4. EXISTING CITY BUILDING COMMISSIONING

#### PROJECT IDENTIFICATION:

Project ID: RC4  
 Project Name: Existing City Building Commissioning  
 Focus Area: Resource Conservation & Efficiency  
 Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
 Department: Public Works

#### PERFORMANCE:

Net Present Value: \$124,000  
 Return on Investment: 96%  
 Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
 Project Contribution: 11% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Perform Existing Building Commissioning of the City's largest and most complex facilities. Existing Building Commissioning (EBCx) is a systematic process for investigating, analyzing, and optimizing the performance of building systems through the identification and correction of deficiencies. The process verifies that the building and its systems meet current requirements, improves energy / water / thermal comfort performance, resolves operations / controls / maintenance problems, reduces or eliminates occupant comfort complaints, improves indoor environmental comfort / quality, and documents system operations. An investment grade energy audit conducted in 2014 and a facility walk-thru conducted in 2017 both indicated that the City's major facilities could benefit from EBCx.
- b. Measure(s): Achieve 15% electricity savings from existing building commissioning.
- c. Action(s): Procure professional services for existing building commissioning at the City Hall Complex (City Hall, Police, and Cultural Center), OB Johnson, Foster Park and the Public Works Administrative Building. Implement recommendations from existing building commissioning investigation phase. Re-commission key facilities on a regular cycle (e.g. 5 years).
- d. Cost(s): Professional commissioning services costs are estimated at \$0.50 per square foot. An additional investment of about \$30,000 is estimated to implement corrective actions identified by the process. Benefits assume average energy savings of 15%. A Lawrence Berkeley National Laboratory meta-study found typical simple investment payback in commissioning averages 1.8 years with a range of 0.5-3.5 years.
- e. Funding: To be determined.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC5. ELECTRIC VEHICLES & INFRASTRUCTURE

#### PROJECT IDENTIFICATION:

Project ID: RC5  
Project Name: Electric Vehicles & Infrastructure  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Fleet Administrator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$90,000  
Return on Investment: 258%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Displace 10% of gasoline / diesel fuels with fuel efficiency or alternative fuels by 2022 relative to 2013 baseline  
*Project Contribution:* 25% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Replace the most utilized passenger vehicles with electric vehicles (EV), accompanied by electric vehicle support equipment (EVSE), where operationally feasible.
- b. Measure(s): Replace 10 vehicles and provide EVSE by the end of 2019.
- c. Action(s): Develop an annual procurement and operations and maintenance plan to replace 10 vehicles by the end of 2019. Purchase of additional EVs after 2019 will be contingent upon cost-effectiveness relative to alternatives. Vehicles will be replaced with the Nissan Leaf or equivalent. Train technicians on EV maintenance, as necessary. The plan will also include selecting and procuring the most appropriate EVSE for charging the vehicles. Vehicles will be decommissioned from the fleet after 8 years and salvaged. The measure only incorporates the salvage value of vehicles purchased in Year 2, since the salvage value for vehicles purchased in year three will occur outside of the 10 year project lifetime.
- d. Cost(s): The incremental cost is conservatively assumed to be the difference in procurement cost for a Nissan Leaf and an average compact vehicle as defined by the current Florida DMS contract. Based on current terms, this value is approximately \$6,000. Incremental costs going forward will be monitored to account for changes in pricing and to determine whether further EV procurement is cost effective relative to fuel-efficient vehicles. The installed cost of EVSE is assumed to be \$4,000 per charge point per vendor quotes. Benefit(s): Costs are offset by an estimated \$2,500 salvage value after 8 years. The benefits do not include potential maintenance savings. Values are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2017 - 2027 for the Consumer Price Index.
- e. Funding: To be determined.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC6. INCREASE FUEL ECONOMY

#### PROJECT IDENTIFICATION:

Project ID: RC6  
Project Name: Increase Fuel Economy  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Fleet Administrator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$118,000  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Displace 10% of gasoline / diesel fuels with fuel efficiency or alternative fuels by 2022 relative to 2013 baseline  
*Project Contribution:* 25% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Improve the average fuel economy of the city's fleet by procuring high-efficiency vehicles to replace less efficient vehicles.
- b. Measure(s): Replace at least 16 light-duty vehicles (LDVs) with models that have an average annual fuel economy at least 50% greater.
- c. Actions: Identify fuel-inefficient vehicles scheduled for replacement and replace them with higher-efficiency models available via the current Florida DMS contract. In order to preserve the plan rate of fleet replacement, phase the in over three years. The strategy is premised upon a comparison between the incremental cost of replacing vehicles with fuel efficient or electric vehicles alternatives. These costs will be monitored and preference will be given to replacement with electric vehicles, where cost-effective.
- d. Cost(s)/Benefit(s): A negative price premium of about (\$1,300) for specified models is expected relative to the average cost of comparable compact vehicles available via the state contract. However, the cost is assumed to be \$0. A reduced cost per mile for replaced vehicles is expected. This reduced fuel cost per mile includes factors additional to avoided fuel expenditure (e.g. reduced maintenance, etc.). Avoided fuel use is based on an estimated fuel economy improvement of 50% for replacement vehicles. The fuel cost rate is projected to increase by 2.4% on average based on the CBO's Economic Projections for 2017 - 2027 for the Consumer Price Index. The project life is assumed to be 10 years. Vehicles are assumed to have a 10 year life. As a result, salvage value is not included in this assessment.
- e. Funding: The project is based on incremental costs, which are negative, but assumed to be \$0. Vehicle replacement is expected to proceed with existing funding.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC7. INDOOR WATER FIXTURES AND FITTINGS EFFICIENCY

#### PROJECT IDENTIFICATION:

Project ID: RC7  
Project Name: Indoor Water Fixtures and Fittings Efficiency  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$19,000  
Return on Investment: 109%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce potable water consumption for City Operations by 20% by 2022 relative to 2013 baseline  
*Project Contribution:* 19% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Reduce water consumption at city facilities by replacing flow fixtures with modern, high-efficiency fixtures.
- b. Measure(s): Reduce targeted buildings' annual water consumption by at least 20% by 2025 by replacing 80% of fixtures with low flow technologies.
- c. Actions: A 2014 audit of City facilities indicated that most fixtures / fittings were not low flow. Update the audit flow fixtures in City facilities to identify opportunities for replacement with low flow fixtures. Based on results of audits develop a schedule of flow fixtures to be replaced, source cost-effective, high efficiency replacement fixtures, and install the new fixtures. Develop a standard specification for flow fixtures in city facilities. High efficiency flow and flush fixtures are as follows: lavatory: 0.5 gallons per minute (gpm), kitchen sink: 1.8 gpm, toilet: 1.0 - 1.28 gallons per flush (gpf), urinal: 0.5 gpf.
- d. Cost(s) / Benefit(s): Implementation costs are estimated at \$22,000. Investment is expected to be phased over two years beginning in year 2. Benefits are based on reducing water consumption in the City's buildings by about 20% on average at an avoided cost rate of \$4 per 1000 gallons (kgal) and \$0.085per avoided kilowatt hour (water heating savings are estimated at 60 kWh / year per 1000 gallons avoided). The avoided cost rates are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2017 - 2027 for the Consumer Price Index.
- e. Funding: To be determined.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### RC8. HVAC CONTROLS

#### PROJECT IDENTIFICATION:

Project ID: RC8  
 Project Name: HVAC controls  
 Focus Area: Resource Conservation & Efficiency  
 Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
 Department: Public Works

#### PERFORMANCE:

Net Present Value: \$174,000  
 Return on Investment: 136%  
 Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
*Project Contribution:* 4% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Utilize digital building automation software and controls to centrally control the City's HVAC systems.
- b. Target(s): Save an average of 14% of total electric billings at the buildings networked to the building automation system (BAS).
- c. Actions: Design and install a BAS solution, including the following: Update the BAS at the City Hall Complex to a modern, digital system with a software front end capable of remotely monitoring and controlling systems across the City. As necessary, update controllers at the City Hall Complex. Install networked rooftop unit (RTU) controllers, networked programmable thermostats, networked sensors and associated electrical equipment at Cultural Center, Fire Station 60, Fire Station 90, Hepburn Center, DPW Compound, Golden Isles Tennis Center and Foster Park. Control smaller, simpler buildings with a networked thermostat. Larger, more complex buildings will utilize networked controllers for key systems (e.g. RTUs, water heaters, etc.). Periodically re-commission the BAS.
- d. Costs: The estimated cost for installation / configuration of a BAS (software, controls hardware, low & high voltage, wiring, electrical/electronic installation, troubleshooting, etc.) is estimated at \$0.2/sf for small buildings and \$2/sf for large buildings. Estimates of savings average 14% of utility expenditure. Values are escalated by the average Consumer Price Index for the period 2017 - 2027.
- e. Funding: To be determined.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC9. RIGHT SIZE FLEET

#### PROJECT IDENTIFICATION:

Project ID: RC9  
 Project Name: Right Size Fleet  
 Focus Area: Resource Conservation & Efficiency  
 Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Fleet Administrator  
 Department: Public Works

#### PERFORMANCE:

Net Present Value: \$447,000  
 Return on Investment: 524%  
 Project Life: 10 years

#### GOALS:

Focus Area Goal: Displace 10% of gasoline / diesel fuels with fuel efficiency or alternative fuels by 2022 relative to 2013 baseline  
*Project Contribution:* 10% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Optimize the fleet by removing under-utilized or otherwise undesirable (e.g. aged, expensive to operate, obsolete, etc.) vehicles, without replacing them. Establish a motor pool that allows staff to reserve a vehicle when required.
- b. Measure(s): Remove approximately 80% of under-utilized / undesirable (e.g. aged, expensive to operate, obsolete, etc.) vehicles; with the remaining 20% establish a motor pool that allows staff to reserve a vehicle when required.
- c. Actions: Identify underutilized / undesirable vehicles that could be replaced with a motor pool vehicle. Estimate how many must be retained to develop a motor pool. Salvage identified vehicles and do not replace them. Establish a motor pool. Monitor vehicle usage in the motor pool. Overtime, calibrate the total number of vehicles and the number of vehicles in the motor pool to meet the City's identified needs.
- d. Cost(s)/Benefit(s): Costs are assumed to be \$0, although tools (such as consultants or software) may be required to establish and monitor the motor pool. Benefits include the salvage value of about 35 vehicles and avoided maintenance and fuel costs. Total avoided costs are projected to increase by 2.4% on average based on the CBO's Economic Projections for 2017 - 2027 for the Consumer Price Index.
- e. Funding: No funds are expected to be required for this project.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC10. EXPAND REUSE WATER PROJECTS

#### PROJECT IDENTIFICATION:

Project ID: RC10  
Project Name: Expand Reuse Water Projects  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: City Engineer  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$148,000  
Return on Investment: 45%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce potable water consumption for City Operations, Residential and Commercial Sectors from by 40% by 2040 relative to 2013 baseline  
*Project Contribution:* 5% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

a. Objective: Expand the reuse water infrastructure in Three Islands to provide an alternative water supply for the landscaped medians. Decrease the amount of potable water used for irrigation in the City. Provide an alternative to potable water for private development irrigation. The project will be phased and each phase will have a specific timeline and deliverables. Phase 1 is nearing completion and includes installation of an 8-inch reuse water line from Wiley Street (City of Hollywood) to Scavo Park. Phase 1 allows irrigation of Scavo Park, medians located at north, south and west of the intersection of Three Islands Boulevard and Atlantic Shores Boulevard, and residential areas west of Three Islands Boulevard between NE 11th Street and Parkview Drive. Phase 2 involves installation of a reuse water line down Three Islands Boulevard from Scavo Park to East Hallandale Beach Boulevard. This water line will be designed to have the capacity to irrigate medians on East Hallandale Beach Boulevard. In addition, it will serve office building irrigation use, and residential areas/medians along Parkview Drive and Leslie Drive. Phase 3 includes installing a reuse water line from Three Islands Boulevard/East Hallandale Beach Boulevard west down East Hallandale Beach Boulevard to Federal Highway. Phase 3 will be evaluated after the completion of Phase 2. The costs and benefits of Phases 1 and 3 are not included in the analysis.

b. Target(s): Reduce government operations potable water consumption by 20% by 2022 and community water use by 40% by 2040. Volumes of reuse water will be metered to evaluate its share of water use over time.

c. Action(s): Staff will request the Phase 2 project be created for the design during the FY18/19 budget process. After October 1, 2018, staff shall procure professional services using CCNA for the design services. Commission approval will be required to approve the design services. The design phase is expected to take 5 months. The City will issue an Invitation to Bid. Staff will provide education and outreach to the community. The Construction Phase is expected to last 6 months.

d. Costs/Benefits: The cost for the pipe (not including the pump station) for Phase 1 of the project was \$224,000. In total, 3,200 linear feet of 8" PVC pipe and fittings were used, at \$70/LF. The cost per linear foot of pipe from Phase 1 was used to estimate costs for Phase 2. Design costs for Phase 2 were estimated at the median of the range of \$75,000 - \$100,000 provided by the City. Ocean outfall of wastewater will no longer be allowed in Florida by 2025. Cities with wastewater treatment plants, such as Hollywood, must find alternative ways to dispose of wastewater. Wastewater that is used as reuse water for irrigation is heavily treated and is a viable alternative to ocean outfall. Hallandale Beach receives a water withdrawal allocation from the South Florida Water Management District. This allocation limits the amount of water that the City can withdraw from the aquifer via its wells. The City's permit expires in 2033 and it is not known if the future permitted allocation will remain constant or will include an increase or decrease. Therefore, it is in the best interest of the City to replace its potable water usage for irrigation as much as possible. Economic benefits are calculated using a 96% cost reduction for reuse water compared to potable water. Since private users will be allowed to access reuse water for irrigation, benefits accrue both to the City government and the community.

e. Funding: Phase 1 of the project received two (2) grants from FDEP in the amounts of \$200,000 and \$240,000. For Phase 2 design, \$50,000 is available from the CVS Development Agreement and an additional \$25,000 will be requested from the Water Fund. Staff shall request funds for construction during the FY19/20 budget process.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC11. EXPANDED SERVICE HOURS WORK WEEK

#### PROJECT IDENTIFICATION:

Project ID: RC11  
Project Name: Expanded Service Hours Work Week  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Human Resources Director  
Department: Human Resources

#### PERFORMANCE:

Net Present Value: \$765,000  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
Project Contribution: 44% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Transition City operations (potentially only applicable to certain City Departments) to an extended service hour work week model – work schedules shift from a 5-day week to a 4-day week.
- b. Measures: Reduce water, energy, fuel, overtime and sick leave usage expenditures. These would be tracked in order to assess the efficacy of the program. Increase employee satisfaction. Employee satisfaction and morale will also be tracked via survey.
- c. Action(s): Compile case studies of other cities that have transitioned to a 4-day work week and request data either supporting or refuting the effectiveness of the program. Compile data from other cities and create a report. Present report to senior staff. Survey staff to gather their input and gauge their receptiveness. Present proposal to City Commission. Initiate outreach campaign geared toward City residents and businesses. Outreach to residents and businesses would be necessary in order to increase awareness of potential changes in City hours of operation. It will be important to promote the fact that numerous municipalities within Broward, Miami-Dade and Palm Beach counties are shifting to this work schedule. Staff education may be necessary, depending on what type of system the City potentially adopts. For example, if the City adopts a 4-day work week it must ensure that all staff adhere to the policy in order to achieve energy savings and counteract the feeling of “missing out” (access to senior management staff or ideas/information) by not working a 5-day week.
- d. Cost(s)/Benefit(s): Cost related to staff time to conduct research and develop a plan. Benefits are based on savings reported by Hollywood, FL and Miramar, FL after those Cities transitioned to an expanded service hours format. The cities realized about \$340,000 and \$330,000 in avoided water, electricity, fuel, overtime and sick leave usage, respectively. Savings are estimated at 42% and 66% of this level, respectively, then averaged, given the ratio of Hallandale Beach’s employees to the benchmark cities.
- e. Funding: No dedicated funding is required for this project.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### RC12. IRRIGATION EFFICIENCY

#### PROJECT IDENTIFICATION:

Project ID: RC12  
 Project Name: Irrigation Efficiency  
 Focus Area: Resource Conservation & Efficiency  
 Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
 Department: Public Works

#### PERFORMANCE:

Net Present Value: \$-7,000  
 Return on Investment: -3%  
 Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce potable water consumption for City Operations by 20% by 2022 relative to 2013 baseline  
 Project Contribution: 61% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective: Conserve water by increasing the efficiency of city irrigation systems.
- b. Measure(s): Save 15% of water use accounts associated with irrigation relative to the 2016 baseline usage.
- c. Action: Procure and Install higher-efficiency equipment to replace existing equipment for all of the City's irrigation systems. Convert sprinklers to drip irrigation, use more efficient sprinkler heads, use weather and/or sensor-based irrigation controls, and properly maintain irrigation systems.
- d. Cost(s) / Benefit(s): Implementation costs are estimated at \$0.026 per avoided gallon, based on research conducted by US EPA and University of Texas. Benefits are based on avoided water charges. Values are projected to increase by 2.4%, on average, based on the CBO's Economic Projections for 2017 - 2027 for the Consumer Price Index. The project is expected to be completed over five years.
- e. Funding: To be determined.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### MR1. INCREASE COMMUNITY-WIDE WASTE DIVERSION

#### PROJECT IDENTIFICATION:

Project ID: MR1  
Project Name: Increase Community-wide Waste Diversion  
Focus Area: Materials Minimization & Recycling  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Operations Manager  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$1,066,000  
Return on Investment: 54%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Achieve a 30% diversion rate from recycling and composting by 2022 relative to 2013 baseline  
*Project Contribution:* 100% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Increase the City's single family and multi-family garbage diversion rate for municipal solid waste (MSW). Create a robust education and outreach program to promote materials minimization and recycling.
- b. Measure(s): Increase the diversion rate for MSW by 5% annually from baseline level of 5%, to 30% over ten years. Diversion rates as calculated for this measure do not include bulk/yard waste, which is collected and disposed by Waste Management Inc. Diversion rates also do not include incineration/waste to energy as a diversion strategy.
- c. Action(s):  
Improve Collection: Conduct waste and recycling audits to get a picture of the City's current diversion/contamination rates. Develop a better understanding of bulk/yard waste disposal so this category can be included in diversion strategies and the City's overall diversion goals. Research best practices to increase diversion rate. Research recycling rewards programs (Ex: Recycle Bank). Hire a Recycling Coordinator position or ensure that the Sanitation Superintendent is dedicated to increasing the City's recycling rate. Maintain back yard / side yard collection service by City employees with new rear-loading, compacting collection vehicles, which are already included in the City's annual vehicle replacement program. Increase the number of document shredding events in the City. Evaluate sanitation/recycling truck capacity and route efficiency. Consider tagging recycling that has a large amount of contamination, with eventual fines for repeat violators.  
Recycling Bins/Containers: Ensure that all public spaces have recycling bins accompanying waste bins. Use larger recycling bins with lids. Consider smaller curbside waste bins and larger recycling bins – or giving customers the option to choose to pay extra for a larger waste bin or accept a smaller bin and agree to reduce waste generation and increase recycling rate. Ensure curbside bin consistency throughout the City (garbage bins should be a different color than recycling bins). Ensure that bins are properly identified – a sticker of the recycling guide should be attached to every bin.  
Education/Outreach: Utilize education and outreach to boost recycling among the City's single family residents. Partner with local organizations (churches, schools, non-profits, businesses) to help promote recycling. Work with elected officials to help promote recycling program. Create an education program specifically geared toward schools. Promote recycling on sanitation trucks. Mandate recycling in multi-family buildings. Send a recycling guide to every resident. Host materials reduction and recycling workshops at Community events and condos. Target separate outreach for single family and multi-family residents. Promote outreach for electronic waste and hazardous waste drop off program. Educate City sanitation/janitorial staff about importance of recycling and proper techniques to ensure that recycling is separated from waste/garbage. Highlight residents/buildings that are recycling properly.
- d. Cost(s)/Benefits(s): New recycling containers are expected to cost \$500,000, with expenditures occurring in 2019 and 2020. \$150,000 per year is budgeted for a Recycling Coordinator who will plan and manage operational and infrastructure improvements, education and outreach. Substantial cost savings are possible if the City reduces the amount of waste that it sends to the landfill and increases its diversion rate. The City pays \$48/ton to dispose of waste and receives a rebate of \$28/ton for recycled content. Accordingly, every ton diverted generates a \$76 benefit to the City. Disposal costs are projected to increase by 2.4% annually on average based on the CBO's Economic Projections for 2018 - 2027 for the Consumer Price Index. Recycling revenue is assumed to stay flat (no increase).
- e. Funding: To be determined.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### MR2. GREEN PURCHASING PROGRAM

#### PROJECT IDENTIFICATION:

Project ID: MR2  
Project Name: Green Purchasing Program  
Focus Area: Materials Minimization & Recycling  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Procurement Director  
Department: Procurement

#### PERFORMANCE:

Net Present Value: \$12,000  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce electricity consumption for City Operations by 15% by 2022 relative to 2013 baseline  
*Project Contribution:* 1% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Preferentially purchase consumables, durable goods, and cleaning products and materials that will enhance ecological sensitivity, promote the health and safety of staff and citizens and reduce operating expenses. Realize the City's role in creating a market for sustainable goods and foster an atmosphere of innovation. Act as a catalyst for entrepreneurship. Minimize the use of non-essential materials and practices.
- b. Measure(s): Purchasing is meticulously tracked by each Department. Comprehensively track purchases of consumables, durable goods and cleaning products by costs that meet criteria established under this program and compare to total purchases in those categories.
- c. Action(s): Create staff team to draft policy. Gradually increase its scope over time, beginning with consumables (e.g. office supplies) with recycled content, durables goods (e.g. electric equipment) with the ENERGY STAR label, and cleaning products and materials that meet standards such as Green Seal or Environmental Choice. Educate purchasers about the policy and its benefits. Comprehensively track purchases and report results annually.
- d. Cost/Benefits: Costs and benefits for consumables and cleaning materials were not estimated. It is possible that environmentally-preferable purchasing will be more expensive than business-as-usual. In depth research into replacement products will have to be done, but it may be impossible to avoid cost increases in some purchasing sectors. The market for green products and services is expanding which will likely bring down costs over time. ENERGY STAR electronics are assumed to be available at no incremental cost. Benefits: Electricity savings assume 20% of legacy electronics are replaced with ENERGY STAR devices each year. Energy savings are estimated at an average of 28% using the Savings Calculator for ENERGY STAR Qualified Office Equipment. After 5 years, all devices are assumed to be ENERGY STAR. Green purchasing benefits for other categories are more difficult to quantify, but may include reduced cost, improved health and wellness, GHG emissions reduction, reduced waste, reduced liability and reputational benefits.
- e. Funding: To be determined.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### MR3. COMPOSTING FEASIBILITY ASSESSMENT

#### PROJECT IDENTIFICATION:

Project ID: MR3  
Project Name: Composting Feasibility Assessment  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Green Initiatives Coordinator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$-48,000  
Return on Investment: -100%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Achieve a 30% diversion rate from recycling and composting by 2022 relative to 2013 baseline  
*Project Contribution:* 0% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Complete a Composting Feasibility Assessment to assess the potential to increase waste diversion through a community-wide composting program.
- b. Target: To identify the potential cost avoidance to the City from diverting compostable waste through a municipal program, as well as the potential costs of implementing such a program by evaluating various options for program implementation (i.e. public/private partnership, cost sharing agreement with nearby local governments, or contracting with a composting service provider).
- c. Actions: Develop a Request for Proposal (RFP) for a Composting Feasibility Assessment, secure funding, accept proposals, and procure the study.
- d. Exact costs of a Composting Feasibility Assessment are unknown, but should be below \$50,000. Benefits will include a clear understanding of various options for implementing composting in the City, as well as their pros and cons, and financial implications. Financial benefits related to waste diversion will accrue only after a composting program is selected and implemented.
- e. Funding: To be determined



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### LT2. BIKESHARE

#### PROJECT IDENTIFICATION:

Project ID: LT2  
Project Name: Bikeshare  
Focus Area: Land Use & Transportation  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Transportation & Transit Planner  
Department: Development Services

#### PERFORMANCE:

Net Present Value: \$0  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Increase the percentage of the bicycle / pedestrian network that is level of service B or better by 10% annually by 2022 relative to 2013 baseline  
*Project Contribution:* of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective: Provide residents with a dock-less bicycle share program. Bikes are rented via a mobile applications. They are electronically locked/unlocked and tagged with a GPS.
- b. Measure: Establish a successful dockless bikeshare service in the City. Success can be determined based on criteria and data on system usage from vendors (e.g. travel miles, miles per hour, routes, pick up and drop off locations, rental duration, ridership, etc.).
- c. Action: Research best practices in comparable cities. Research necessary permits and regulatory requirements. Develop a bike share request for proposals. Research permitting requirements and apply for necessary permits. Establish city-wide regulations for operation of the Bikeshare system. Monitor performance of the system.
- d. Costs/Benefits: Dockless bikeshare systems are established by third-party, for-profit entities. They must be permitted / regulated to operate in the City, but there is no upfront capital cost required on the part of the City. Investments in the City's bicycle infrastructure that would support ridership are outside the scope of this project.
- e. Funding: No funding is required.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### LT3. BUILD-OUT BICYCLE AND PEDESTRIAN INFRASTRUCTURE

#### PROJECT IDENTIFICATION:

Project ID: LT3  
Project Name: Build-out Bicycle and Pedestrian Infrastructure  
Focus Area: Land Use & Transportation  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Transportation & Transit Planner  
Department: Development Services

#### PERFORMANCE:

Net Present Value: \$-660,000  
Return on Investment: -100%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Increase the percentage of the bicycle / pedestrian network that is level of service B or better by 10% annually by 2022 relative to 2013 baseline  
*Project Contribution:* of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Improve bike and pedestrian level of service in the City and reduce vehicle miles traveled (VMT). Achieve connectivity. Improve bike and pedestrian safety. Ensure equity of infrastructure expansion. Ensure that improvements are aesthetically pleasing.
- b. Measure: Increase the percentage of bicycle / pedestrian network that is Level of Service B or better by 10% annually through 2022.
- c. Action(s): Adopt Bicycle and Pedestrian Level of Service (LOS) standards. Assess gaps in connectivity (bike and pedestrian) based on LOS and Basis of Design Report (BODR) and the Draft 2016 Multimodal Mobility Plan. Expand upon City's bike/ped master map to create an action plan. Implement bike lane projects. Create uniform signage. Consider complementary solutions to encourage walking / biking (e.g. Wilton Manor's Hopper Shuttle Service). Create education and outreach plan.
- d. Cost/benefits: Costs include development of LOS standards and implementation of bike lane projects. These costs are derived from the draft 2016 multimodal mobility plan. Incremental investments in sidewalk improvements outlined in the BODR are assumed to occur outside the scope of this project. The benefits of reduced VMT and increased bicycle and pedestrian travel are significant, including reduced congestion and pollution, improved quality of life. Nevertheless, these benefits are difficult to quantify and are assumed to be zero for the purposes of this estimation.
- e. Funding: To be determined. (Grants, mobility bond, transportation fund (gas tax), CRA, etc.)



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY

### NR1. DEVELOP A VULNERABILITY / ADAPTATION ASSESSMENT

#### PROJECT IDENTIFICATION:

Project ID: NR1  
Project Name: Develop a Vulnerability / Adaptation Assessment  
Focus Area: Natural Resources & Resiliency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Green Initiatives Coordinator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$-82,000  
Return on Investment: -100%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Complete a vulnerability assessment and adaptation action plan by 2022 relative to 2013 baseline  
*Project Contribution:* 100% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

a. Objective: Allow the City to understand how roadways, buildings, infrastructure and neighborhoods will be impacted by sea level and ground water rise, increases/decreases in precipitation, storm surge and other future impacts related to climate change. Allow the City to better serve its residents that will be impacted by sea level rise and other impacts in the future. Understand how demographics may shift as a result of sea level rise/other factors. Communicate risk to the community. Create a list of projects (engaging City staff from multiple departments) in prioritizing projects and funding that will allow the City to adapt and mitigate risk. Discuss the potential reality of a managed retreat from coastal areas. Compile best practice information explaining how the City can maintain infrastructure that will be impacted by environmental factors in the future (ex: how to maintain underground infrastructure that is constantly or oftentimes inundated). Discuss best practices that other coastal south Florida communities have implemented to adapt to and mitigate future risk. Gain an understanding of City policies that should be updated or created in order to address future vulnerability. Understand economic impacts of future conditions and the cost of maintaining a business as usual approach.

b. Measure(s): Procure Vulnerability assessment in 2018. Begin implementing recommendations in 2018.

c. Action(s): Create outline for scope of work and obtain proposal from consultants. Choose a consultant and negotiate final scope of work, deliverables, contract etc. Develop maps and graphics to show vulnerability of various assets in the City under multiple SLR scenarios. Overlay various risks and demographics in the City. Quantify potential economic losses under different scenarios. Develop strategies to manage risk. Develop communications strategy and deliverables to convey risk to community. Host two Community Workshops or smaller informal events at condos/other gathering places to discuss vulnerability assessment

d. Costs/Benefits: Estimate \$50,000 or less for Vulnerability Assessment. Benefits: CRS credit is available for activities related to a vulnerability and adaptation study. In addition, adaptation and flood hazard mitigation in coastal Louisiana has shown a savings of \$4 of disaster recovery costs for every \$1 spent on elevation and flood proofing. Understanding the City's future risk and creating programs and policies to ensure a resilient future will allow the City to exist in a recognizable form in the future. The benefits of acting early, before the impacts of CC and SLR are evident, are impossible to overstate. People have the tendency to discount the future and plan for the present. If coastal communities are to remain viable we must decide to prepare for an uncertain future. A vulnerability assessment will help make that future much less uncertain and aid the City in prioritizing adaptation/mitigation projects.

e. Funding: This project should be able to be funded through grants, such as the ECO Broward Grant or the FDEP's Resilient Coastal Communities Grant. If the City is unsuccessful in obtaining a grant for the project, staff can include a request for funding during the FY18/19 or FY19/20 budget cycle.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### NR3. DUNE PROTECTION PLAN

#### PROJECT IDENTIFICATION:

Project ID: NR3  
Project Name: Dune Protection Plan  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Public Works Director  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$0  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Complete a dune management plan by 2022 relative to 2013 baseline  
*Project Contribution:* 100% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Create a comprehensive dune management plan to improve resiliency of City's dune system and prevent beach erosion by preserving and restoring primary coastal dunes. Remove invasive species from public and private beach areas. Work with private property owners on the beach to improve the dune system. Increase public education and awareness of importance of dune restoration and maintenance. Create and elaborate upon re-nourishment funding mechanisms. Aid in planning for impacts of sea level rise. Create a long term maintenance plan for the dune system.
- b. Measures: Creation of dune management plan.
- c. Actions: Research local Dune Management Plans (e.g. the Cities of Hollywood and Miami Beach hired a consultant to complete a plan). This plan will be included in future updates to the City's Comprehensive Plan). Hallandale Beach will create a team, led by the Green Initiatives Coordinator, to evaluate best management practices and adapt them to its own plan. Creation of the Plan will require working closely with private property owners on the beach, partnering with relevant local organizations, such as YEA, in order to create an impactful outreach and education strategy, and holding community workshops to educate residents and businesses about importance of dunes. The final plan will include, among other things, a description of current conditions; an explanation of why dune management is necessary and desirable; research into the practicality of other potential erosion control measures that can work in conjunction with a dune system; explanation of what comprises an optimal dune system in Hallandale Beach; a plan for actual dune system in Hallandale Beach; discussion and graphics outlining recommended dune vegetation; dune habitat creation techniques and planting guidelines; discussion of constraints to achieving optimal dune system; analysis of how dune system may impact wildlife (ex: nesting sea turtles); development of an implementation plan and budget, a long-term maintenance plan and an education and outreach plan; reporting requirements; and incorporation on the plan into City Beach Renourishment projects.
- d. Cost(s) / Benefit(s): The plan will be developed in-house by staff. As a result, incremental costs are assumed to be zero. Benefits are substantial, including protection of private property, infrastructure, commerce and natural resources. While significant, quantification of these benefits is challenging and uncertain. Accordingly, they are assumed to be zero.
- e. Funding: The Dune Management Plan will be developed by City staff, therefore there should not be a fiscal impact in creating the Plan. Funding may be necessary for program outreach and education once the Plan has been completed. This recommendation will be included in the Plan.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### NR4. LOW IMPACT DEVELOPMENT STANDARDS

#### PROJECT IDENTIFICATION:

Project ID: NR4  
Project Name: Low Impact Development Standards  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Development Services Director  
Department: Development Services

#### PERFORMANCE:

Net Present Value: \$0  
Return on Investment: ∞  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Improve the City's CRS rating to 500% by 2022 relative to 2013 baseline  
Project Contribution: 0% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Increase City's capacity to manage stormwater. Promote use of environmental services to supplement traditional stormwater management in the City. Increase awareness of LID strategies. Utilize LID projects as educational case studies to promote program. Minimize impervious surface area in the City. Integrate LID strategies into City properties and right-of-way. Integrate LID principles into Development Regulations.
- b. Measure: Creation of LID regulations in the City Code.
- c. Actions: Research LID practices/regulations in Florida and southeastern U.S., such as the LID manuals developed by the Cities of Jacksonville and Sarasota. Identify current sections of the City's code and comprehensive plan that incorporate the principles of LID. Determine what additional strategies are desirable and applicable in Hallandale Beach (ex: medians converted to bioretention swales, permeable pavement requirements etc.) and determine what strategies work synergistically to create the most positive benefit. Create an internal City committee to evaluate the feasibility of LID regulations, rank and prioritize strategies for inclusion in an LID regulation, if applicable. Develop draft recommendations, including fiscal and maintenance impacts. Bring recommendations forth to City Manager and to City Commission, if directed. Implement LID standards on City properties and right-of-way. Incorporate LID principles into Development Regulations, as warranted. Update Development Review Committee, City staff, developers, residents etc. about new LID Code, if applicable. Showcase success stories in the community with visual signage.
- d. Costs/Benefits: Staff time will be required to develop LID policy recommendations. No additional cost is expected. Benefits include minimization of investments in traditional stormwater management infrastructure, flood abatement, water quality improvement and beautification of the City. Flood abatement benefits have the potential to influence the City's CRS classification, which could potentially reduce flood insurance premiums throughout the City. These benefits are not quantified at this time.
- e. Funding: This project will be completed by City staff.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### EO1. INTEGRATE SUSTAINABILITY INTO EMPLOYEE TRAINING AND INCREASE EMPLOYEE PARTICIPATION

#### PROJECT IDENTIFICATION:

Project ID: EO1  
Project Name: Integrate Sustainability into Employee Training and Increase Employee Participation  
Focus Area: Education & Outreach  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Green Initiatives Coordinator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$2,000  
Return on Investment: 5%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Train 100% of employees to understand and contribute to its sustainability initiatives by 2022 relative to 2013 baseline  
*Project Contribution:* 100% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Increasing employee awareness of City sustainability programs and policies. Help to achieve behavior change in City employees so that they conduct their daily activities in a more sustainable way. Increase employee participation in sustainability initiatives. Educate employees about sustainability initiatives the City offers so that they are better able to educate residents. Gather input and feedback from staff members about sustainability programs/policies.
- b. Target(s): Ensure 100% of staff members receive sustainability training.
- c. Actions: Develop a training and participation incentive program outline, with input from the Education and Outreach Focus Group. Receive approval from Public Works Director/Assistant City Manager. Receive approval from Human Resources Director and City Manager, if needed. Set up multiple training events to reach all City employees. Training will be conducted by department (it is possible to combine small departments, and make allowances to include training employees with non-traditional work hours). Track number of employees participating in sustainability projects. Create sustainability projects to raise internal awareness (e.g. City employee Trashion Show) or competitions (recycling, litter pick up, beach cleanup) and offer rewards (shirts, gift card, extra casual dress day, extra half vacation day).
- d. Cost(s) / Benefit(s): Training would be conducted by City staff. Additional costs incentives, e.g. t-shirts, gift cards, etc., estimated at \$3,500/year. Feedback, education and awareness campaigns have been shown to produce savings (e.g. on utility expenditures) of 0 to 10%. This measure assumes just 0.2% savings from greater employee awareness of the city's use of electricity, water and fuel and their impact on expenses, the environment and the community. Increased employee awareness of sustainability initiatives will promote better adherence to sustainability policies and increase employee engagement in sustainability programs. Other benefits include improved employee morale and serving as a team building activity. A final benefit is improved service. If staff better understands programs they will be able to more effectively communicate to residents.
- e. Funding: To be determined. This is a low cost initiative. Staff time will be needed in order to complete this project.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### EO2. COMMUNICATIONS PLAN

#### PROJECT IDENTIFICATION:

Project ID: EO2  
 Project Name: Communications Plan  
 Focus Area: Resource Conservation & Efficiency  
 Year Established: 2018

#### RESPONSIBILITY:

Project Manager: IT Director  
 Department: Innovation Technology

#### PERFORMANCE:

Net Present Value: \$0  
 Return on Investment:  $\infty$   
 Project Life: 10 years

#### GOALS:

Focus Area Goal: Develop a sustainability communications plan by 2022 relative to 2013 baseline  
 Project Contribution: 100% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. **Objective**
  - b. **Measure(s)**
  - c. **Action**
  - d. **Cost(s)/Benefit(s)**
  - e. **Funding**
- a. Objective: Create a comprehensive communications plan that lays out marketing strategy, responsibility and content for each audience (staff, residents, businesses, vendors, visitors etc.). The Communications Plan will aid the Green Initiatives Coordinator in tracking program outreach.
- b. Measure(s): Completion of Communications Plan. Tracking outreach to ensure that it adheres to the goals outlined in the Communications Plan.
- c. Action(s): The Green Initiatives Coordinator will research best practice case studies from other entities and develop an outline for the City's Plan, coordinating with the IT Department, City Manager's Office and other Departments as necessary. Coordinator will discuss first draft of Plan with Public Works Director and IT Director. Coordinator will draft final Plan
- d. Cost(s) / Benefit(s): This is a no cost initiative – it will require staff time.
- e. Funding: No funding is required for this project.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### EO3. DEVELOP GREEN EVENT POLICIES

#### PROJECT IDENTIFICATION:

Project ID: EO3  
Project Name: Develop Green Event Policies  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Green Initiatives Coordinator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$0  
Return on Investment: ∞  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Reduce total City operations waste by 5% through source reduction by 2022 relative to 2013 baseline  
*Project Contribution:* 0% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Increase sustainability of City events and reduce the amount of waste generated at each event (both internal and external). Educate vendors and staff about new green event policy. Reduce the carbon footprint of City events. Work toward ensuring that City giveaways are reusable. Increase recycling at City events.
- b. Measures: Divert at least 30% of event waste from the landfill. Reduce total waste volume at events by at least 5%. Track the percentage of event materials purchases that meet Green Event criteria (to be established).
- c. Actions: The Green Initiative Coordinator will research best practice Green Event Policies (i.e. from peer municipal entities, colleges / universities, and the private sector) and create a draft Green Event Policy outline in collaboration with the Event Coordinator. Drafts will be reviewed and refined by the Public Works Director and Parks Director before finalization and approval by the City Manager. The policy will focus on eliminating and replacing key items used at events such as plastic water bottles and bags, Styrofoam, straws, plastic table cloths and minimizing waste. The Coordinators will create an outreach plan for City staff, residents and vendors. Outreach methods may include outreach via email, social media, website and print materials. Content will include clear and concise guidelines for eliminating unnecessary waste and harmful products from events. The Coordinators will track the dollars spent on sustainable vs non sustainable products at events and audit waste and recycling generated at each event. The environmental benefit of using preferable products will also be tracked and reported.
- d. Cost(s) / Benefit(s): This is a no cost initiative requiring staff time only. Event materials identified as harmful will be replaced by low-cost / no cost alternatives. Benefits include waste minimization and improved environmental quality of events. These benefits are not quantified at present.
- e. Funding: No additional funding is required for this project.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### FE1. UTILITY MANAGEMENT SYSTEM

#### PROJECT IDENTIFICATION:

Project ID: FE1  
Project Name: Utility Management System  
Focus Area: Funding & Evaluation  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: IT Director  
Department: Innovation Technology

#### PERFORMANCE:

Net Present Value: \$19,000  
Return on Investment: 36%  
Project Life: 10 years

#### GOALS:

Focus Area Goal: Measure and monitor 50% of sustainability key performance indicators by 2022 relative to 2013 baseline  
*Project Contribution:* 90% of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Utilize software tools to manage the City's FPL energy utility bills on a monthly basis, including: auditing bills, tracking usage and costs, benchmarking facility performance, tracking the results of energy savings projects, analyzing trends and reporting on performance. Over time, expand the tool to include other facilities-based utilities and services, including water and waste.
- b. Measure(s): Save an average of 1% of total electric billings from identifying erroneous charges and / or identifying anomalies and performing corrective actions.
- c. Actions:: Select/procure, configure/interface/populate and train staff to operate software to manage utilities. The solution should be able to accurately track, trend and report on utility use and expenditure, while controlling for weather, floor area, occupancy and other parameters associated with utility use. It should interface with ENERGY STAR Portfolio Manager and result in a fully functional portfolio of City facilities in that software. Optionally, the solution should interface with the City's asset management and billing systems and accept the industry standard format for electronic utility billing data transfer. Obtain a utility management solution. Populate ENERGY STAR Portfolio Manager w/ facility data. Procure off-the-shelf via a customized solution or develop in-house a fully featured solution.
- d. Cost(s) / Benefit(s): The cost for an off-the-shelf Utility Management Solution is estimated at \$55,000 for implementation, configuration, customization, interfaces and training. Annual software licensing/service fee for is estimated at \$10,000 per year. Estimates of savings are 1% of annual utility expenditure. Values are escalated by the average Consumer Price Index for the period 2018 - 2027.
- e. Funding: To be determined.



## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### FE2. REVOLVING FUND

#### PROJECT IDENTIFICATION:

Project ID: FE2  
Project Name: Revolving Fund  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Finance Director  
Department: Finance

#### PERFORMANCE:

Net Present Value: \$0  
Return on Investment:  $\infty$   
Project Life: 10 years

#### GOALS:

Focus Area Goal: Fund sustainability action plan projects with 50% internal funds, 50% external funds by 2022 relative to 2013 baseline  
*Project Contribution:* of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Create a reoccurring and long-term source of funding for sustainability projects. Leverage the cost savings realized from high ROI projects to help fund low ROI, but environmentally impactful, projects in the future. Reduce the amount of funding needed from the City's General Fund for sustainability projects. Projects from all departments in the City could contribute to the fund (cost sharing between departments).
- b. Measure(s): Establish a fund by 2019.
- c. Action(s): Create a Revolving Fund Management Committee (Sustainability Coordinator, Assistant Director of Public Works, Budget Manager, Assistant Director of Finance and others). Create accounting and financial procedures plan (setting up Revolving Fund, how funds are released from fund, how fund balance is increased by receiving energy savings etc.). Create guidelines designating which projects qualify for funding through Revolving Fund (energy savings of at least X%, payback period of X years and X% of energy cost savings from project being transferred back to Revolving Fund, educational or demonstrational value of project, etc). Create guidelines for submitting projects for funding through Revolving Fund. Create guidelines for tracking performance of funded projects (estimated cost savings and measured energy consumption, payback period, energy audits etc.). Identify available rebate programs for which the City's existing or planned projects would qualify (rebate would be allocated to RF). Estimate energy savings associated with current or proposed projects and transfer savings to Revolving Fund. Apply for federal, state, local and private grants for energy efficiency projects. Allocate a portion of annual investment earnings to the Revolving Fund. Recommend and request (from the City Commission) a one-time infusion of seed capital from operating budget.
- d. Cost(s) / Benefit(s): There are no direct costs or benefits associated with this project.  
Education: Educate members of City staff so that they become aware of program's existence and requirements. Promote Revolving Fund success stories to businesses and residents so that they may be spurred to take similar energy efficiency action. Educate members of Revolving Fund Management Committee (this is a new concept and staff members will most likely require training and research to foster an understanding of the concept and implementation).
- e. Funding: Seed capital authorized by City Commission or receipt of grants. See above for more funding options.

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### FE3. COMPLETE A GHG INVENTORY AND SET REDUCTION TARGETS

#### PROJECT IDENTIFICATION:

Project ID:	FE3
Project Name:	Complete a GHG Inventory and Set Reduction Targets
Focus Area:	Resource Conservation & Efficiency
Year Established:	2018
RESPONSIBILITY:	
Project Manager:	Green Initiative Coordinator
Department:	Public Works
PERFORMANCE:	
Net Present Value:	\$-24,000
Return on Investment:	-100%
Project Life:	1 years
GOALS:	
Focus Area Goal:	Measure and monitor 50% of sustainability key performance indicators by 2022 relative to 2013 baseline
Project Contribution:	of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Aid the City in understanding the magnitude and sources of GHG emissions community-wide and in doing so, gain a better understanding of which sectors in the community are most heavily contributing to climate change. The Inventory will also allow the City to create a targeted set of consistent policies, strategies and projects aimed at reducing emissions. The eventual GHG inventory and targets will be folded in the Sustainability Action Plan.
- b. Measure(s) The GHG inventory will map emissions by sector and will be a quantitative study that will identify opportunities and solutions to reduce the City's emissions. The inventory will use 2016 as a baseline year and subsequent evaluations will track energy consumption, emissions (carbon dioxide equivalency) etc. against this year. The City will continually evaluate yearly progress and fine tune projects to achieve desired results. Each project that the City will undertake will be tied to a quantitative reduction target and an actual realized value. The effectiveness of the program or policy can be monitored through tracking reductions in GHG emissions over time.
- c. Actions: Receive grant funding, Issue a Request for Quotes, select firm and negotiate Scope of Work. Hold Kick-Off Meeting with City Staff to discuss Scope of Work and project schedule. Collect data, both – internal (water/wastewater, fuel and electricity use, fleet operations etc.) and external (industrial, commercial and residential electricity, natural gas and fuel oil consumption, transportation and solid waste disposal). Develop GHG inventory using web-based inventory software such as the International Council for Local Environmental Initiatives (ICLEI) ClearPath software. Benchmark Hallandale Beach against peer cities, forecast emissions trends under business as usual scenario, set tangible emissions reductions goals, and incorporate GHG inventory into SAP.
- d. Cost/Benefits: Estimated costs are \$24,500. Benefits are not quantifiable. However, the Inventory will allow the City to pinpoint areas (ex: buildings and/or roadways) that are in need of improvement – both internally and community-wide. The Inventory will help staff make the case for implementing future sustainability projects, as it will forecast emissions that will be expected to occur under business as usual and potential future action scenarios.
- e. Funding: Grant funding will be sought to fund this project (e.g. the ECO Broward grant)

## CITY OF HALLANDALE BEACH SUSTAINABILITY ACTION PLAN PROJECT MANAGEMENT FORM SUMMARY



### FE4. STAR COMMUNITIES CERTIFICATION

#### PROJECT IDENTIFICATION:

Project ID: FE4  
Project Name: STAR Communities Certification  
Focus Area: Resource Conservation & Efficiency  
Year Established: 2018

#### RESPONSIBILITY:

Project Manager: Green Initiative Coordinator  
Department: Public Works

#### PERFORMANCE:

Net Present Value: \$-13,000  
Return on Investment: -100%  
Project Life: 1 years

#### GOALS:

Focus Area Goal: Measure and monitor 50% of sustainability key performance indicators by 2022 relative to 2013 baseline  
*Project Contribution:* of Focus Area Goal

#### PROJECT DESCRIPTION:

- a. Objective
- b. Measure(s)
- c. Action
- d. Cost(s)/Benefit(s)
- e. Funding

- a. Objective: Receive recognition for the sustainable policies and programs that the City has achieved to date and gain a better understanding of areas that can be improved in the future. Use the Certification results to inform City staff and community members of the steps that the City is taking to achieve sustainability. Measure performance across social, economic and environmental performance areas.
- b. Measure: Achieve a 3-STAR Rating.
- c. Actions: Once the City is ready to report, it must subscribe to the STAR Full Access Package to access the full suite of tools and resources. Create a certification team, composed of internal staff members or an external green team comprised of community members. Align existing policies and programs with Rating System (1-2 months). Gather data and enter into STAR's online reporting platform (4-6 months) – 526 measures in total. Submit online application for verification by STAR. Make amendments and edits as needed. STAR Community Rating is valid for 4 years. Then City must report on progress and recertify.
- d. Costs/Benefits: Annual subscription to STAR Full Access Package is \$1,000/year. Verification is a one time fee of \$3,000. The certification process will be completed by City staff and possibly with the help of a community green team. Benefits cannot be quantified. However, the process will help the City track and evaluate its performance, communicate progress to stakeholders, and enhance the City's brand.
- e. Funding: Grant funding will be sought to fund this project.



## BUDGETS

For each project, net benefits / costs (benefits minus costs), costs and benefits are shown over ten years. The total for each project and year are shown.

## NET BENEFITS / COSTS

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
LED Streetlights	-\$54,333	-\$43,333	-\$33,333	\$32,000	\$33,000	\$34,000	\$35,000	\$35,000	\$36,000	\$37,000	\$111,000
LED Interior Lighting	\$0	\$0	\$0	-\$33,000	-\$24,000	\$17,000	\$18,000	\$18,000	\$19,000	\$19,000	\$34,000
Solar Thermal Systems	\$0	\$0	-\$13,000	-\$9,500	-\$9,500	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	-\$22,000
Existing City Building Commissioning	-\$52,000	\$29,000	\$29,000	\$20,000	\$14,000	-\$38,000	\$43,000	\$44,000	\$34,000	\$30,000	\$153,000
Electric Vehicles & Infrastructure	\$0	-\$19,643	-\$11,027	\$17,241	\$17,655	\$18,079	\$18,513	\$18,957	\$19,412	\$32,378	\$111,564
Increase Fuel Economy	\$4,499	\$9,214	\$14,153	\$14,493	\$14,840	\$15,197	\$15,561	\$15,935	\$16,317	\$16,709	\$136,917
Indoor Water Fixtures and Fittings Efficiency	\$0	-\$7,800	-\$7,000	\$5,200	\$5,300	\$5,400	\$5,500	\$5,700	\$5,800	\$5,900	\$24,000
HVAC controls	-\$57,208	-\$49,424	\$37,454	\$38,353	\$39,274	\$40,216	\$41,181	\$42,170	\$43,182	\$44,218	\$219,417
Right Size Fleet	\$42,845	\$53,177	\$63,509	\$41,329	\$51,661	\$51,661	\$51,661	\$51,661	\$51,661	\$51,661	\$510,825
Expand Reuse Water Projects	-\$88,000	-\$443,000	\$88,196	\$90,406	\$92,669	\$94,986	\$97,359	\$99,789	\$102,278	\$104,826	\$239,509
Expanded Service Hours Work Week	\$0	\$89,708	\$91,861	\$94,066	\$96,324	\$98,635	\$101,003	\$103,427	\$105,909	\$108,451	\$889,384
Irrigation Efficiency	-\$13,000	-\$12,000	-\$10,000	-\$8,000	-\$6,000	\$9,000	\$9,000	\$9,000	\$10,000	\$10,000	-\$2,000
Increase Community-wide Waste Diversion	\$139,976	-\$305,158	-\$202,439	\$151,427	\$254,734	\$254,734	\$254,734	\$254,734	\$254,734	\$254,734	\$1,312,210
Green Purchasing Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Composting Feasibility Assessment	\$0	-\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$50,000
Bikeshare	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Build-out Bicycle and Pedestrian Infrastructure	\$0	-\$10,000	-\$170,000	-\$280,000	-\$270,000	\$0	\$0	\$0	\$0	\$0	-\$730,000
Develop a Vulnerability / Adaptation Assessment	\$0	-\$86,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$86,000
Dune Protection Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Low Impact Development Standards	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Integrate Sustainability into Employee Training and Increase Employee Participation	\$3,000	-\$500	-\$400	-\$300	-\$200	-\$200	-\$100	\$0	\$100	\$200	\$1,600
Communications Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Develop Green Event Policies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Management System	-\$40,611	\$6,614	\$6,845	\$7,081	\$7,323	\$7,571	\$7,824	\$8,084	\$8,350	\$8,622	\$27,703
Revolving Fund	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Complete a GHG Inventory and Set Reduction Targets	\$0	-\$25,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$25,000
STAR Communities Certification	\$0	-\$4,000	-\$1,000	-\$1,000	-\$1,000	-\$1,000	-\$4,000	-\$1,000	-\$1,000	-\$1,000	-\$15,000
Total	-\$114,832	-\$868,144	-\$117,181	\$179,796	\$316,079	\$609,279	\$696,236	\$707,456	\$707,742	\$724,698	\$2,841,130
Payback (Years)											6.0

## COST

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
LED Streetlights	-\$64,333	-\$64,333	-\$64,333	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$193,000
LED Interior Lighting	\$0	\$0	\$0	-\$41,000	-\$41,000	\$0	\$0	\$0	\$0	\$0	-\$82,000
Solar Thermal Systems	\$0	\$0	-\$14,000	-\$10,500	-\$10,500	\$0	\$0	\$0	\$0	\$0	-\$35,000
Existing City Building Commissioning	-\$80,000	\$0	\$0	\$0	\$0	-\$80,000	\$0	\$0	\$0	\$0	-\$160,000
Electric Vehicles & Infrastructure	\$0	-\$27,864	-\$27,864	\$0	\$0	\$0	\$0	\$0	\$0	\$12,500	-\$43,229
Increase Fuel Economy	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Indoor Water Fixtures and Fittings Efficiency	\$0	-\$10,000	-\$12,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$22,000
HVAC controls	-\$75,000	-\$86,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$161,000
Right Size Fleet	\$32,513	\$32,513	\$32,513	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$97,539
Expand Reuse Water Projects	-\$88,000	-\$443,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$531,000
Expanded Service Hours Work Week	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Irrigation Efficiency	-\$15,000	-\$15,000	-\$15,000	-\$15,000	-\$15,000	\$0	\$0	\$0	\$0	\$0	-\$75,000
Increase Community-wide Waste Diversion	\$0	-\$550,000	-\$550,000	-\$300,000	-\$300,000	-\$300,000	-\$300,000	-\$300,000	-\$300,000	-\$300,000	-\$3,200,000
Green Purchasing Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Composting Feasibility Assessment	\$0	-\$50,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$50,000
Bikeshare	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Build-out Bicycle and Pedestrian Infrastructure	\$0	-\$10,000	-\$170,000	-\$280,000	-\$270,000	\$0	\$0	\$0	\$0	\$0	-\$730,000
Develop a Vulnerability / Adaptation Assessment	\$0	-\$86,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$86,000
Dune Protection Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Low Impact Development Standards	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Integrate Sustainability into Employee Training and Increase Employee Participation	\$0	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$3,500	-\$31,500
Communications Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Develop Green Event Policies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Management System	-\$50,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$3,000	-\$77,000
Revolving Fund	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Complete a GHG Inventory and Set Reduction Targets	\$0	-\$25,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	-\$25,000
STAR Communities Certification	\$0	-\$4,000	-\$1,000	-\$1,000	-\$1,000	-\$1,000	-\$4,000	-\$1,000	-\$1,000	-\$1,000	-\$15,000
Total	-\$339,820	-\$1,345,185	-\$828,185	-\$654,000	-\$644,000	-\$387,500	-\$310,500	-\$307,500	-\$307,500	-\$295,000	-\$5,419,189

## BENEFITS

Project	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
LED Streetlights	\$10,000	\$21,000	\$31,000	\$32,000	\$33,000	\$34,000	\$35,000	\$35,000	\$36,000	\$37,000	\$304,000
LED Interior Lighting	\$0	\$0	\$0	\$8,000	\$17,000	\$17,000	\$18,000	\$18,000	\$19,000	\$19,000	\$116,000
Solar Thermal Systems	\$0	\$0	\$1,000	\$1,000	\$1,000	\$2,000	\$2,000	\$2,000	\$2,000	\$2,000	\$13,000
Existing City Building Commissioning	\$28,000	\$29,000	\$29,000	\$20,000	\$14,000	\$42,000	\$43,000	\$44,000	\$34,000	\$30,000	\$313,000
Electric Vehicles & Infrastructure	\$0	\$8,221	\$16,837	\$17,241	\$17,655	\$18,079	\$18,513	\$18,957	\$19,412	\$19,878	\$154,793
Increase Fuel Economy	\$4,499	\$9,214	\$14,153	\$14,493	\$14,840	\$15,197	\$15,561	\$15,935	\$16,317	\$16,709	\$136,917
Indoor Water Fixtures and Fittings Efficiency	\$0	\$2,200	\$5,000	\$5,200	\$5,300	\$5,400	\$5,500	\$5,700	\$5,800	\$5,900	\$46,000
HVAC controls	\$17,792	\$36,576	\$37,454	\$38,353	\$39,274	\$40,216	\$41,181	\$42,170	\$43,182	\$44,218	\$380,417
Right Size Fleet	\$10,332	\$20,664	\$30,996	\$41,329	\$51,661	\$51,661	\$51,661	\$51,661	\$51,661	\$51,661	\$413,286
Expand Reuse Water Projects	\$0	\$0	\$88,196	\$90,406	\$92,669	\$94,986	\$97,359	\$99,789	\$102,278	\$104,826	\$770,509
Expanded Service Hours Work Week	\$0	\$89,708	\$91,861	\$94,066	\$96,324	\$98,635	\$101,003	\$103,427	\$105,909	\$108,451	\$889,384
Irrigation Efficiency	\$2,000	\$3,000	\$5,000	\$7,000	\$9,000	\$9,000	\$9,000	\$9,000	\$10,000	\$10,000	\$73,000
Increase Community-wide Waste Diversion	\$139,976	\$244,842	\$347,561	\$451,427	\$554,734	\$554,734	\$554,734	\$554,734	\$554,734	\$554,734	\$4,512,210
Green Purchasing Program	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$1
Composting Feasibility Assessment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Bikeshare	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Build-out Bicycle and Pedestrian Infrastructure	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Develop a Vulnerability / Adaptation Assessment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Dune Protection Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Low Impact Development Standards	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Integrate Sustainability into Employee Training and Increase Employee Participation	\$3,000	\$3,000	\$3,100	\$3,200	\$3,300	\$3,300	\$3,400	\$3,500	\$3,600	\$3,700	\$33,100
Communications Plan	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Develop Green Event Policies	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Utility Management System	\$9,389	\$9,614	\$9,845	\$10,081	\$10,323	\$10,571	\$10,824	\$11,084	\$11,350	\$11,622	\$104,703
Revolving Fund	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Complete a GHG Inventory and Set Reduction Targets	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
STAR Communities Certification	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$224,989	\$477,041	\$711,004	\$833,796	\$960,079	\$996,779	\$1,006,736	\$1,014,956	\$1,015,242	\$1,019,698	\$8,260,320