City of Alexandria

ENVIRONMENTAL ACTION PLAN 2040

ECO-CITY ALEXANDRIA

Contents

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ECO-CITY ALEXANDRIA

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PREFACE AND INTRODUCTION

Preface

The City recognizes the urgent need for City-wide environmental planning because of the changing climate as indicated by increased carbon dioxide in the atmosphere, extreme weather events, rising coastal waters, and record-breaking rainfall and high temperatures.

Alexandria has been a Virginia Municipal League leader in regional sustainability for 11 years in the Go Green Virginia challenge, a recognition of local government programs and policies to promote sustainability at the highest level. This new Environmental Action Plan 2040 (EAP 2040) for sustainability builds on the 2008 Eco-City Charter and the Environmental Action Plan 2030 (EAP 2030) adopted in 2009. The EAP 2040 covers the same ten topic areas as the original plan with updates on what has been achieved and new action recommendations to further advance sustainability in the City.

The City has achieved a per capita emission reduction of 22 percent for the 2015 emission inventory over the 2005 base year by completing or adopting, as an ongoing initiative, a majority of actions in the EAP 2030 policy plan. The most significant achievement was closing the coal-fired power plant in 2012 well ahead of the target date. Other achievements are highlighted in each section introduction, as well as a summary document in the appendix, and on the Eco-City webpage.

This new EAP 2040 plan is focused on climate change mitigation and adaptation. The plan actions are focused on local priorities and includes order-of-magnitude cost estimates, relative impactfulness, and references to related documents with more detailed guidance or policy. The plan recognizes the need to include environmental impact as a tool for decision making. New metrics can help identify related impacts from actions in other topic sections. For example, transitioning to electric vehicles both improves energy efficiency and local air quality.

Because commercial and residential buildings, businesses and personal transportation account for 96 percent of greenhouse gas (GHG) emissions, a successful plan means people must participate and make sustainability changes. Challenges include engaging the community into action, fiscal constraints of budget and staff resources, time constraints, and legal authority within the Commonwealth. There are other challenges to achieving aggressive goals and targets including the need for state and federal leadership in the areas of legislative support for renewable energy development, minimum efficiency standards, and providing financial assistance.

At a high level, the goals and targets of the City are to exceed regulatory minimums, achieve carbon neutrality by 2050 and provide better tracking and performance. To be successful, everyone in the City will have to take action, make sustainable choices, do their fair share, and work together to truly make Alexandria a more sustainable Eco-City in which to live, work, and play.

Introduction

Take a walk in the City of Alexandria. Stroll along an historic or modern tree-lined street to one of the weekly farmers markets, small shops, parks, or along the improvements to the waterfront and feel the vibrancy and the tranquility of the City of Alexandria while you see elements of sustainability all around you.

The City takes pride in its historic charm and roots as a river town, but also its modern vitality, as characterized by its waterfront, unique neighborhoods and urban villages of small shops and restaurants. These characteristics have been enhanced by smart development, which has maintained their charm while adding new environmental features. Some sustainable features are hidden, like insulation behind walls, but others are plainly visible, like abundant transit options, treelined streets, high efficiency LED traffic lights, bikeshare stations, and amenities within walking distances.

Alexandria is a highly mobile, culturally diverse community of approximately 150,000 residents and seeks to create an environmentally, economically and socially healthy city where people can live, work and play far into a sustainable future.

Alexandria has long been a leader in sustainability, as far back as its 1998 Quality of Life Summit but more recently highlighted by Eco-City Alexandria initiatives that include the adoption of Eco-City Charter in June 2008, the Environmental Action Plan 2030 (EAP 2030) in June 2009, and this updated Environmental Action Plan 2040 (EAP 2040) in 2019.

ECO-CITY ALEXANDRIA

Eco-Cities are places where people can live healthy and economically productive lives while reducing their impact on the environment. The City works to harmonize existing policies, regional realities, and economic and business markets with their natural resources and environmental assets. Eco-Cities strive to engage all citizens in collaborative and transparent decision-making, while being mindful of social equity concerns.

Introduction

The City fulfilled or exceeded a majority of the 363 actions from the EAP 2030 which have materially improved Alexandria's environmental sustainability and quality of life. The EAP 2030's accomplishments are a credit to the vision and diligent efforts of the City and the Alexandria community. This EAP 2040 update acknowledges the accomplishments from the previous plan; considers the changed global, regional and state issues; identifies the fiscal resources required; and creates a responsive environmental road map for the City of Alexandria for the future.

Going forward, the EAP 2040 will be updated every five years to adapt to the needs of the community, fiscal constraints, changing technologies and global, regional and state issues and guided by the Eco-City Charter's guiding principles:

- Builds Wisely
- Embraces Natural Beauty
- Improves Water Quality
- Cleans the Air
- Moves Smartly
- Conserves Energy and Resources
- Minimizes Waste
- Supports Healthy Living
- Readies for Changes
- Leads Intelligently & Holistically
- Shares Responsibility.

These principles are woven into the City Strategic Plan and related tools such as Small Area Plans, and many master plans and guidelines throughout City departments. The strategic tools are critical components of essential City programs, policies, and processes. The City Strategic Plan sets the general policy direction with the Environmental Action Plan as an integral component of that Strategic Plan.

Plan Structure

The EAP 2040 incorporates the EAP Phase One (approved in October 2018), which only focused on the first five topic sections and was limited to only short-term actions. This report expands those five topics (1-5 below) with mid- and long-term actions and some revisions and addresses the five remaining topics (6-10 below) with short-, mid-, and long-term actions. Each term is five fiscal years (FY). Short-term is FY2019 through FY2023, mid-term is FY2024 through FY2028, and long-term is FY2029 and beyond.

1. Climate Change
2. Energy
3. Green Building
4. Land Use and Open Space
5. Solid Waste
6. Water Resources
7. Transportation
8. Environmental Health
9. Air Quality
10. Implementation, Education, and Outreach

The ten topics each have a section in the plan as they did in 2009 with an average of two goals and four to six actions in each goal. One consideration in the update process was to have fewer actions at a higher, less specific, level to prioritize the City's resources on fewer actions, with higher-level goals targets, and actions. Implementation was retitled to include education and outreach. Related and more detailed City plan and guidance documents referred to in the plan develop the details and specifics based on additional information and analysis.

The introduction for each topic section provides an update on where the city is today. It also cites related programs, policies, plans, guidelines, and resources that coordinate with the EAP 2040 in improving the City's sustainability along the path to an EAP target. The implementation action for updating metrics provides the performance measures to know when we reach the targets. Legislative priorities are included in sections to identify areas where the City needs legal authority. Justifications and primary departments to implement actions are indicated for each section of actions.

Synergies

Actions in the EAP 2040 are interconnected and provide additive benefits across multiple sections. The goals, targets, and actions in one section such as reducing single vehicle commuting in transportation affects other sections such as energy, air quality, environmental health, and land use and open space. EAP 2040 actions also impact emission reduction and environmental impact through related changes in City zoning, code regulations, and City policies and programs.These efforts and changes are most effective when aligned with economic, equitable, and coordinated strategic planning.

Reducing single occupant vehicle trips and expanding low carbon options such as transit, bikes, and walking for transportation are significant opportunities to reduce carbon emissions.

This is especially important in cities because cities generally benefit from the close proximity of community amenities, homes, and jobs. Cities can also work to reduce transportation-based carbon emissions by providing infrastructure for electric vehicles.

These "synergies" connect the impacts of the EAP 2040 across topic sections and the results are captured together in the monitoring and tracking of EAP 2040 progress.

Urgency

Shortly after the Council adopted the EAP Phase One update, the Intergovernmental Panel on Climate Change (IPCC)[1] released a special report on the impacts of global warming. The IPCC report describes impacts and risks associated with global average temperature increases of 1.5ºC and higher, and the deep emissions cuts needed to constrain warming at the 1.5ºC limit. All IPCC paths recommend reducing emissions by 50 percent by 2030 (base year 2010), a mere 11 years from 2019.

The future described by the IPCC report is an aggressive carbon diet with no homes, businesses or industry heated by fossil fuels, no vehicles running on fossil fuels, and all fossil fuel power plants closed. It demands increased natural carbon capture by increasing forests by almost 4 million square miles and direct air capture of carbon.

The City target is to reduce emissions by 50 percent by 2030 (base year 2005) and to approach net zero or carbon neutral, an 80-100 percent reduction by 2050. Local governments, especially urban ones, need to be supported by national and state governments for example to significantly push the regional electric grid to be more renewable and improve the efficiency of vehicles. There are currently no options to replace air travel and an array of other issues, so the emission reductions are dramatic and carbon capture is necessary.

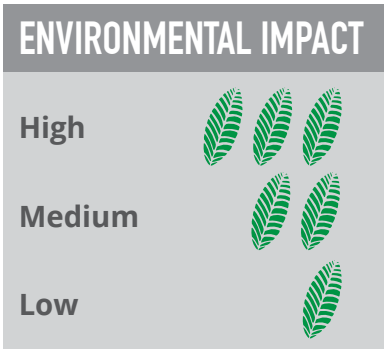
Financing

As a policy plan, the EAP 2040 does not commit or appropriate funds. Rather, it provides strategic guidance for the City Council and City Manager through the regular fiscal planning and budgeting process. Order of magnitude cost estimates are provided. More specific costs will be developed as part of implementation of actions with relevant analysis, evaluation, and task pricing. Incentives, solar bulk pricing, Commercial Property Assessed Clean Energy (CPACE), grants, local partnerships, state and federal funding are part of a mix of opportunities.

1 This Summary for Policymakers should be cited as: IPCC, 2018: Summary for Policymakers. In: Global Warming of 1.5°C. An IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty [Masson-Delmotte, V., P. Zhai, H.-O. Pörtner, D. Roberts, J. Skea, P.R. Shukla, A. Pirani, W. Moufouma-Okia, C. Péan, R. Pidcock, S. Connors, J.B.R. Matthews, Y. Chen, X. Zhou, M.I. Gomis, E. Lonnoy, T. Maycock, M. Tignor, and T. Waterfield (eds.)]. World Meteorological Organization, Geneva, Switzerland, 32 pp

Impactfulness

These EAP 2040 topic areas cross pollinate, facilitate, and leverage each other, to increase the collective beneficial contributions to the environmental, health, social, and economic outcomes for the people, businesses, visitors, and City government operations and resiliency. City-wide initiatives have an impact on reducing carbon emissions, reducing energy consumption, reducing water usage, mitigating flood risks, reducing stormwater pollution, enhancing mobility options, providing public and private open space, improving indoor environmental quality, and providing economic and community vitality.



Greener buildings and operations go beyond regulatory requirements and have positive effects on the environment in different ways. Reducing utility costs can be a benefit for all resident housing, and especially affordable housing, if close attention is paid to controlling development costs. Making buildings more energy efficient reduces carbon emissions based on the current grid fuel mix, while stormwater management contributes to the ecological systems in the local and regional waterways. EAP actions and impacts do not happen in a vacuum and interact with each other in addition to the changes at the state and federal levels. A relative value of "high," "medium" or "low" environmental impact has been assigned to each action.

Achievements

Great strides have been made toward the EAP 2030 goals. Especially noteworthy were:

- achieving an overall reduction of 13 percent in GHG emissions (contributed by changes to the fuel mix of the grid)
- the accelerated closing of the coal-fired power plant leading to significant improvements in air quality in the City and the region
- 95 percent of the square footage under construction or built complying with the 2009 Green Building Policy
- reducing stormwater pollution by 40 percent as of FY2018
- achieving a 48 percent recycling rate since 2011
- reducing vehicles miles traveled by 12.5 percent from 2010 to 2016.

While much has been accomplished, scientific information in the environmental community reinforces that there is more to be done by the City government and the community.

The EAP 2040 builds on the previous work and accomplishments of the EAP 2030. These existing programs and policies are being added to the updated GreenVentory in addition to the original 2007 GreenVentory.[2]

2 GreenVentory is a compendium of the current sustainable programs, policies, and processes in the City on the Eco-City web page.

Introduction

This update advances the City's efforts to:

1. reduce GHG emissions across the City by updating or creating new programs, guidelines, and plans,
2. increase focus on energy efficiency,
3. enhance and protect our local water resources through reductions in stormwater pollution,
4. employ significant controls for sanitary sewer impacts to waterways,
5. strategically locate bike racks, bikeshare stations, and other mobility options,
6. improve recycling with a focus on reducing total solid waste,
7. provide year-round weekly Farmers markets with composting, and
8. increase education and outreach by using social media and tools such as the thermal camera loaning program by the Alexandria library.

Collaboration and Community Engagement

This update, a 20-month collaborative effort by City staff, the Environmental Policy Commission (EPC), and the public included: City Council-EPC joint work sessions, EPC retreats, open houses, an Eco-City Café, an Eco-City Summit, Earth Day, online feedback, EPC meetings, joint meetings with Planning Commission and Park and Recreation Commission, and adoption of EAP Phase One in October 2018. As part of the Eco-City Summit, many attendees signed an Eco-City Pledge to make sustainability commitments a part of their lives.

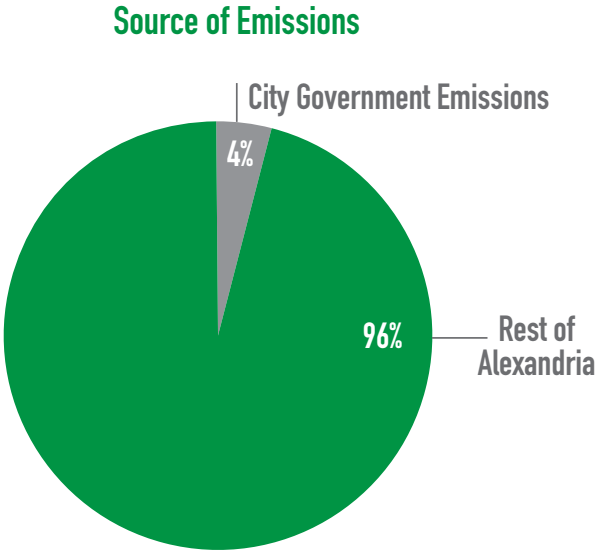
Overarching feedback from public engagement were requests for enhanced education and outreach related to transparency of City's efforts and for guidance on sustainable practices. People generally want to know what individuals, businesses, and the City can do now, and in the future, to reduce environmental impacts. In response, the EAP 2040 includes increased implementation and performance transparency and reporting metrics.

EAP 2040 includes robust education and outreach to the community and businesses including the opportunity to attend a new Eco-City Academy that incorporates all EAP topics and taught by subject matter experts. Community groups and others are encouraged to contact Ellen Eggerton, the Sustainability Coordinator for the City, for more information and to schedule educational events and workshops.

Outreach is essential to engage the community in a call to action and provide feedback on sustainability. The effectiveness of engaging the community can be measured and sharing these key indicators as part of follow-up outreach can facilitate a sustainable culture throughout the City.

Metrics

Updating the key indicators for tracking and measuring, to reflect the new goals, targets, and actions will provide performance monitoring of the EAP 2040 actions and overall accomplishments. Currently City facilities and operations account for only four percent of the emissions and residential, commercial and transportation account for 96 percent, therefore the whole community must act to achieve these goals.

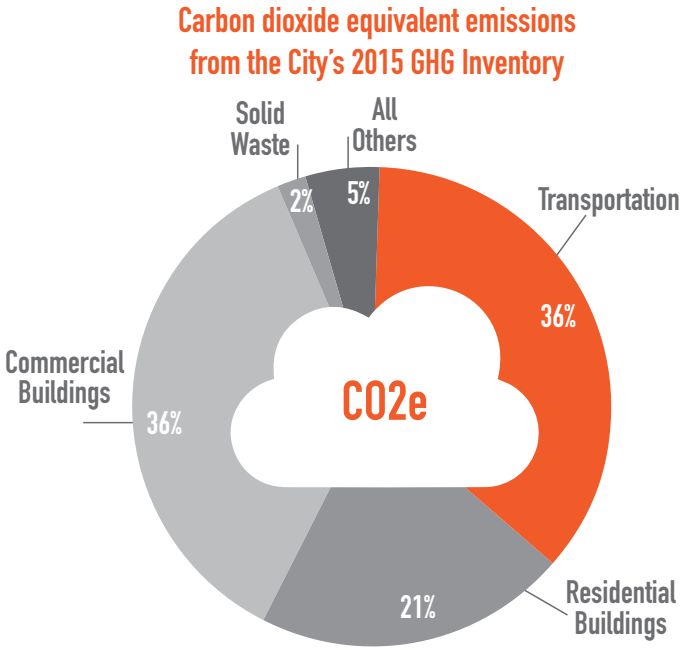


The GHG inventory is done every three years with a base year of 2005. The inventory uses the ICLEI (International Council for Local Environmental Initiatives, which is now Local Governments for Sustainability) methodology prepared by Metropolitan Washington Council of Governments (MWCOG). Some emission values are based on an allocation by population and not directly measured values. The 2015 GHG inventory is in the appendix.

The EAP includes many specific targets that will contribute to overall goals. The City has seen a 22 percent reduction in GHG emissions per capita from 2005 to 2015. Emissions decreased from 14 metric tons of carbon dioxide equivalent (mtCO2e) per capita to 11 mtCO2e per capita while moving towards the target of 10 mtCO2e per capita n 2022, 6 mtCO2e per capita in 2030, and 1-3 mtCO2e per capita in 2050.

According to the most recent GHG emissions inventory (2015 mtCO2e), Alexandria's city-wide profile (includes City buildings and operations) is 57 percent from buildings (36 commercial, 21 residential). Transportation accounts for 36 percent and includes pass through traffic and contributions from rail and air travel. Solid waste accounts for 2 percent with the remaining 5 percent from "all others."

Improvements to reduce emissions cannot always include measures to track actual emission reductions because the values are part of larger aggregate data.



The contribution of City emissions from various sectors of the community show that the majority emissions are from the built environment, followed by transportation.

Summary of Goals and Targets

The EAP 2040 includes targets with metrics to indicate performance. Below is a summary of EAP 2040 targets and metrics. The complete descriptions of goals and targets are in the topic sections.

Metric	Short-term	Mid-term	Long-term
CLIMATE CHANGE			
Total GHG emission reduction over 2005 base year			50% by FY2030 and 80-100% by FY2050
ENERGY			
Renewable offset of City-owned facilities electrical use	100% by 2020		
Improve energy efficiency for City-owned facilities and affiliated transportation		Reduce by 25% by FY2027 over FY2018	
Reduce GHG emissions per capita	10 metric tons per capita by FY2022	6 metric tons per capita by FY2030	4 metric tons by FY2040 and 1-3 by FY2050
LAND USE AND OPEN SPACE			
Tree Canopy percent			40% by FY2035
Open Space Acres per 1,000 residents	7.3	7.3	7.3
SOLID WASTE			
Reduce GHG emissions from solid waste over a 2019 base year	By FY2023 reduce by 12%		
WATER RESOURCES			
Achieve stormwater phosphorus pollution reduction (MS4) target	By FY2023 to 70%	By FY2025 to 100%	
TRANSPORTATION			
Reduce vehicle miles traveled	By FY2023 reduce 1% per year		
Increase transit, walking, and biking	By FY2023 Increase by 15% over 2018		
Increase dedicated bus lanes			By FY2030, double to 1.5 miles
AIR QUALITY			
Reduce ozone	By FY2023, reduce to 70 ppb or lower		

Challenges

There are significant challenges to meet an 80-100 percent GHG emissions reduction by 2050 and the interim goal of 50 percent reduction of GHG emissions by 2030. Opportunities in urban environments are different from rural environments. For instance, low-carbon mobility options are available in urban environments while space for solar farms are available in rural. It can be challenging to implement emission reductions in an existing built environment, but there are opportunities to do so in building upgrades, equipment efficiency, and operational improvements.

The City of Alexandria within the Commonwealth of Virginia is constrained by the Dillon Rule. The Dillon Rule restricts the authority of the City. In the EAP 2040, issues regarding legal authority are shown as legislative priorities and not action items because the ability to take action is outside the authority of the City.

Achieving the goals will take collective action by the City government and the community in all focus areas, along with collaboration with our regional partners and state and federal government - specifically with respect to renewable energy, complementary regulations, and improved federal efficiency standards. Enhanced education and outreach will include a focus on the next generation adopting a culture of sustainability as a new norm.

Introduction

The electric grid provided by the City's utility supplier is currently about 3 percent renewable generation.[3] To achieve emission reduction targets, a significant increase in the renewable energy portion of the electrical distribution is needed. According to the IPCC, the share of electricity supplied by renewable resources needs to increase by 36-97 percent overall. The U.S. Energy Information Administration says that, overall, the grid in the U.S. was about 17 percent renewable in 2018.[4]

The regional methodology calculates transportation as 36 percent of the City's GHG inventory total which includes contributions of through traffic, metro subway, rail, and air travel. While Alexandria was the most successful in reducing vehicle miles traveled in the region there are significant portions of the 36 percent transportation sector emissions that are outside the control of the City government and community.

The EAP 2040 works towards aspirational goals and targets with potentially achievable actions in the short-term and more aspirations in the mid- and long-term. As outside factors change, the EAP 2040 targets may be accelerated.

3 Dominion Energy Virginia's 2018 Integrated Resource Plan, May 1, 2018, figure 3.1.1.3.

4 https://www.eia.gov/energyexplained/index.php?page=electricity_in_the_united_states.

CLIMATE CHANGE

Climate Change

As a tidal riverfront city, Alexandria is particularly vulnerable to the real and urgent threats of climate change. Old Town is already regularly subject to tidal and weather-related localized flooding that affects the wellbeing of the City. Reducing carbon emissions in all sectors is a key mitigation strategy. City-owned buildings and operations generate only about 4 percent of total emissions, while the remaining 96 percent is from residential and commercial buildings and transportation as illustrated in the carbon dioxide equivalent (CO_2e) graphic.

Most of the actions outlined in the EAP reduce the City's share of contributions to climate change. The contribution of City emissions from various sectors of the community show that the majority are from buildings, followed by transportation. Current core functions in the City require the use of fossil fuels during the transition to electrification where replacement technologies are not currently available.

The City's GHG inventory trend from 2012 to 2015 indicates decreases from transportation due to lower carbon mobility options and changes in the grid fuel mix with increases from population growth. The data is not normalized for weather.

Rising sea levels and the increased frequency and intensity of storms will make localized flooding a more significant issue, impacting public safety, private property, and businesses. Resiliency planning and adaptations at the waterfront and elsewhere, along with emergency operations, are also key actions.

The Intergovernmental Panel on Climate Change (IPCC) Summary for Policymakers, provides scientific information on the environmental, political and economic impacts of climate change recommendations that cannot be achieved by the City in isolation. It requires significant leadership at the state and federal level. The IPCC target is to be net zero or carbon neutral by 2050. The City targets are a 50 percent reduction by 2030 and at least an 80 percent but ideally 100 percent reduction, by 2050.

The carbon dioxide (CO_2) measurement reached 415 parts per million (ppm) in the atmosphere in May 2019 (Mauna Loa Observatory in Hawaii). This is an indication of how humans are changing the climate of the planet. CO_2 measurement directly correlates with global temperature and ocean acidification. Excessive carbon dioxide (and CO_2 equivalents) put into the atmosphere have been trapping heat, described as a greenhouse effect. This heating effect will continue to accelerate and trap heat for hundreds of years causing new heat records and devastating impacts to the planet.

Getting to the goal of carbon neutral requires actions at all levels of government, participation by the public, substantial emission reductions, carbon sequestrations, and negative emissions technologies such as aggressive tree planting and reforestation.

1 Climate Change

GOAL

Increase the City's preparedness to respond to the impacts of climate change and environmental emergencies

TARGET

Reduce community-wide GHG emissions by 50 percent by FY2030 and 80–100 percent by FY2050 (base year 2005) supported by significant contributions at the state and federal level toward renewable energy and energy efficiency mandates

SHORT-TERM ACTIONS

1.1.1

By FY2021, establish a multidisciplinary task force to guide an update of the Energy and Climate Change Action Plan. The Energy and Climate Change Task Force will base its recommendations for improvements in energy efficiency for both new and existing private and public buildings on the Green Building Policy.

The Plan will include recommendations for specific policies and programs, each with funding strategies, to achieve emissions reductions targets by

1) increasing of renewable energy production and availability for city residents and businesses;
2) working to curtail consumption of fossil fuels;
3) engaging Alexandria residents and businesses in emissions-reducing actions;
4) identifying opportunities for climate adaptation policies and practices.

Cost Estimate: $305,000

Cost Breakdown: $150,000 is for consultant services to propose recommendations for policies and programs and $155,000 is for staff (1 FTE) to support a new task force.

1.1.2

By FY2022, determine appropriate policies and guidelines for estimating projected greenhouse gas (GHG) emission impacts from operations and capital improvement program (CIP) expenditures through the City's budget process. This is a multi-step process which includes: identifying projects and programs likely to have a significant impact on community-wide GHG emissions and calculating costs to programs and projects marked for GHG assessments. By FY2024, the assessment process shall use a Community Energy Model to forecast GHG emissions. Results should be published consistent with the City's budget process.

Cost Estimate: Costs are dependent on the number of projects per year that meet the guidelines, but the process may require one to three percent of project costs to estimate GHG emissions.

1.1.3

By FY2021, establish sustainability criteria for investments made by city-controlled pension funds that consider minimizing the exposure of city investments to publicly-traded companies pursuing fossil fuel extraction.

Cost Estimate: Existing staff resources

MID-TERM ACTIONS

1.1.4 By FY2024, complete a climate vulnerability assessment of community and infrastructure systems. Evaluate the vulnerabilities and risks to the City and community's financial and social-welfare resulting from changing climate conditions. Evaluate critical infrastructure and community systems and their ability to respond during environmental emergencies.

Cost Estimate: $100,000

Cost Breakdown: Consultant engagement and strategy development are estimated to be $75,000–$100,000

1.1.5 By FY2026, update Energy and Climate Action Plan to evaluate the benefits, feasibility, and timing of policies and programs. These policies and programs will support community deep-energy efficiency retrofit programs, electrification transition from fossil fuels of existing private buildings, and potential renewable energy supply implementation locally and regionally to offset community electricity use.

Cost Estimate: $100,000

Cost Breakdown: Consultant engagement and strategy development are estimated to be $75,000–$100,000

1.1.6 By FY2028, update the City's Emergency Operations Plan (EOP) and Continuity of Operations Plan (COOP) to include infrastructure resiliency. Provide and/or identify infrastructure in the city for response to environmental emergencies such as shelter, potable water, and local emergency power planning.

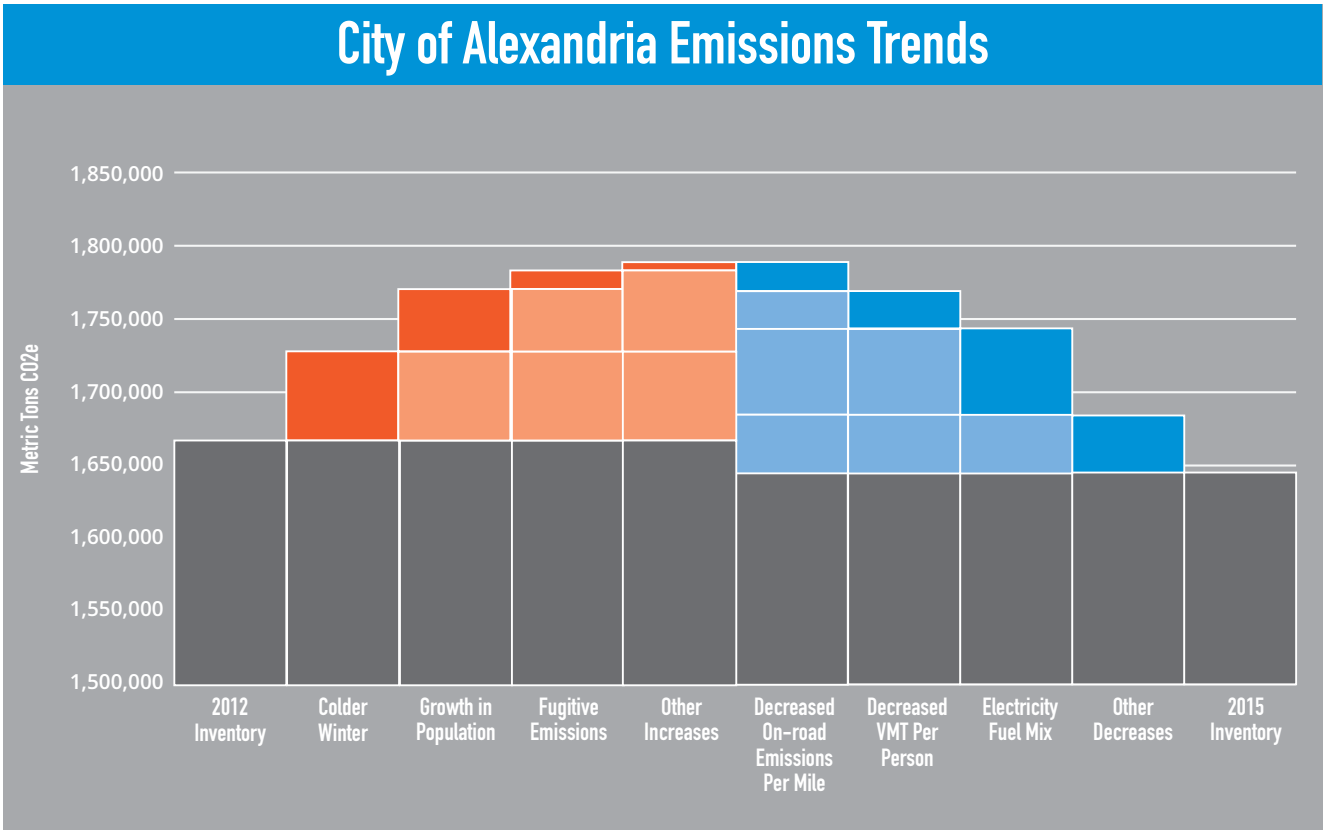
Cost Estimate: $100,000

Cost Breakdown: Consultant engagement and strategy development are estimated to be $75,000–$100,000

1.1.7 By FY2024, develop and implement a state-level legislative and regulatory engagement strategy to identify, create, and/or support policy opportunities to reduce GHG emissions associated with community energy use, and climate adaptation and resiliency.

Cost Estimate: $100,000 strategy development + $25,000 /year

Cost Breakdown: Consultant engagement and strategy development are estimated to be $75,000–$100,000. Estimated $25,000 per year for external staffing or technical support to implement legislative and regulatory policy engagement.



"The "Emissions Trends" graph shows the cumulative changes in GHG values from various factors. Orange represents increasing factors and blue represents decreasing factors. The data is not normalized for weather.

LONG-TERM ACTIONS

1.1.8 By FY2035, implement updated Energy and Climate Change Action Plan action (1.1.4) and include climate action measures in City financial and service decision making.

Cost Estimate: Total costs of updated Energy and Climate Change Action Plan actions will be developed as part of plan development process.

Legislative Priorities

State-level policy and regulatory activities relevant to identifying and creating opportunities for climate adaptation and resiliency.

Justification

The goal, target and actions are consistent with the City's commitments to addressing climate change as part of the Metropolitan Washington Council of Governments (MWCOG) Regional Climate and Energy Action Plan.[1] They align with the Paris Agreement,[2] our stated commitments, and live up to our identity as an environmental policy leader to achieve our target GHG emission reductions. Such GHG emissions reduction targets are consistent with the Intergovernmental Panel on Climate Change Assessment Report of limiting global warming to within 1.5-degrees C response strategies. Engagement of the community is essential to reducing the 96 percent emissions generated by the community and the 4 percent by city operations.

Accountable Parties

General Services (primary), Transportation and Environmental Services, Management and Budget, Planning and Zoning and the community.

1 MWCOG, Regional Climate and Energy Action Plan, p.24. goo.gl/GmDkzh

2 382 US Climate Mayors commit to adopt, honor and uphold Paris Climate Agreement goals. http://climatemayors.org/actions/paris-climate-agreement/

ENERGY

Energy

Energy is the lifeblood of Alexandria. The systems that provide comfort in the homes and buildings we occupy, the vehicles we drive or the transit we use, the provision of safe and clean drinking water, the production and transportation of goods and services, the growing and processing of food, and communications technologies all rely on the use of energy resources.

Alexandria exists within a complex energy ecosystem where no less than 96% of Alexandria's greenhouse gas emissions result from the direct or indirect use of fossil fuel energy resources. Natural gas to heat homes, buildings, or water; electricity generation from coal, natural gas, oil, or biomass for lights, cooling, computers, and phones; gasoline or diesel fuel to drive – such fossil fuel use results in the release of greenhouse gas emissions into the Earth's atmosphere locally and globally to accelerate and contribute to the effects of climate change.

Alexandria's local actions in the EAP are reducing reliance on fossil fuel energy for buildings and transportation and facilitating the transition to 100 percent renewable energy supply. The actions in this section also support many of the goals in other sections of the EAP 2040 such as Climate Change, Air Quality, Transportation, and Environmental Health. EAP 2040 energy goals, targets, and actions powerfully contribute to the collective regional, state, national, and global efforts necessary to aggressively combat possible disastrous consequences to the planet and society from climate change while enhancing Alexandrians' and society's quality of life.

The City is reducing energy usage through efficient lighting and other projects. For example, two projects alone represent about $45,000 in annual savings; LED lights at the Courthouse have reduced electric demand by 90kW and lowered annual electricity consumption by 15 percent; and at 2900 Business Center Drive demand has been reduced by 70kW, and a 20 percent reduction in total facility electrical use.

The City of Alexandria is rolling out LED lighting upgrades across City buildings and streetlights. Lighting, building system controls, and equipment improvements will reduce the City's electricity consumption to achieve the 25 percent efficiency improvement target and associated greenhouse gas emissions.

2 Energy

2.1. RENEWABLE ENERGY

GOAL

Transition all applicable Alexandria government facilities to 100 percent renewable energy for all energy-use needs to mitigate Alexandria's contribution to climate change

TARGET

By FY2030, transition all applicable Alexandria government facilities to 100 percent electricity and offset this electrical energy use by 100 percent renewable energy

SHORT-TERM ACTIONS

2.1.1 By FY2020, increase Renewable Energy Certificate (REC) purchases to offset 100 percent of electrical energy use by City government facilities. This temporary measure will be phased out as direct purchasing and onsite generation grow to represent an increasing share of the City's electrical energy supply over time.

Cost Estimate: $100,000 per year

Cost Breakdown: Approximately $58,500 has been committed in FY2019 to achieve approximately 60 percent offset of electricity use. Costs will vary slightly year over year to accommodate net changes in electrical energy use from energy efficiency implementation, weather influences, and operational changes.

2.1.2 By FY2021, develop a renewable energy supply strategy to evaluate the risks, benefits, feasibility, optimal mix and timing of potential renewable energy supply implementation pathways considering the City's current and future energy use demands. Should beneficial direct purchase or other opportunities become available before the strategy is complete, the City should prudently evaluate and consider implementation.

Cost Estimate: $100,000

Cost Breakdown: $50,000–$100,000, depending on the rigor of analysis.

Energy

2.1.3 By FY2023, ensure that direct purchasing of offsite renewable electrical energy accounts for at least 50 percent of electrical energy use at all City-operated facilities. The remainder will be made up by REC purchases and onsite renewable electrical energy generation to achieve a 100 percent renewable energy supply.

Cost Estimate: $175,000–$3,500,000

Cost Breakdown: Capital cost (consulting, contracting and procurement, acquisition, installation, etc.) is estimated to be approximately $175,000 for implementation of 50 percent electrical energy offset from a direct purchasing opportunity and up to $3,500,000 if feasible on-site renewable energy installation opportunities are implemented. The balance may be achievable through RECs. Both direct purchasing opportunities and feasible on-site renewable energy installations have high potential to result in cost savings to the City with an estimated simple payback ranging from 10–20 years. As renewable energy markets continue to mature, opportunities may exist that result in shorter simple payback periods. Optimal mix, savings estimates, and purchasing strategies will be identified from short-term action 2.1.2.

MID-TERM ACTIONS

2.1.4 By FY2024, develop an electrification and renewable energy supply transition plan for the City's non-electricity energy use including the conversion of natural gas and other fossil fuel use in facilities and operations that can be supported by renewable energy supply.

Cost Estimate: $100,000–$200,000

Cost Breakdown: $100,000–$200,00, depending on rigor of analysis.

2.1.5 By FY2028, ensure that direct purchasing of offsite renewable electrical energy accounts for at least 80 percent of electrical energy use at all City-operated facilities. Ensure it is from a regional source that contributes to the growth of renewable energy capacity in the region. Onsite renewable electricity generation and REC purchases will make up the remainder, to achieve a 100 percent renewable electrical energy supply.

Cost Estimate: $100,000–$150,000/year

Cost Breakdown: $100,000–$150,000 per year is assumed for purchases of RECs where onsite or purchase from an offsite renewable source is not supported by the City's renewable energy supply strategy. Until further information is available on the long-term electrical energy needs of the City, the total cost of RECs is unknown. However, $100,000–$150,000 should serve as a conservative estimate.

LONG-TERM ACTIONS

2.1.6 By FY2040, implement electrification of all City non-electricity energy use (City facilities, operations, and vehicles).

Cost Estimate: Cost estimates are not available as the cost and technology are rapidly changing. Further study is necessary to provide cost estimates.

2.1.7 By FY2035, ensure that onsite renewable electrical generation and direct purchasing of offsite renewable electrical energy, are from a regional source and add to the supply of renewable energy available, increases to 100 percent of electrical energy use at all City-operated facilities.

Cost Estimate: $0/year

Cost Breakdown: A cost of zero per year assumes previous investment in onsite renewable electrical energy generation that has not exceeded the systems' useful life, offsite renewable electrical energy from a regional source contract continues to be active, and any additional electrical energy supply requirements are met through available renewable energy programs that are at cost parity or the lower marginal cost as compared with conventional generation sources of today.

Legislative Priorities

1. Make permanent an aggregate municipal net metering pilot program, include expanded renewable energy system capacity limits, increase cost offset to equal the value of solar resources, remove administrative costs, and provide applicability across a range of utility rate classes.
2. Consider electricity load aggregation opportunities to leverage statutory retail choices.

Justification

Provides electrification and renewable energy supply transition of the City's non-electricity energy use (natural gas and other fossil fuel use) in City facilities and operations supported by renewable energy supply to offset the City's greenhouse gas emissions.

Accountable Parties

General Services (primary); Transportation and Environmental Services

2.2 ENERGY EFFICIENCY

GOAL

Accelerate implementation of all feasible energy efficiency and emission reduction measures for City-owned buildings and infrastructure, and City-affiliated transportation

TARGET

By FY2035, improve energy efficiency in City facilities and operations by 50 percent over a FY2018 baseline use

SHORT-TERM ACTIONS

2.2.1 By FY2023, update the facility asset condition auditing process for facility asset conditions (Facility Condition Index, FCI) rating methodology) to reflect facility energy and sustainability performance. In addition, include energy audits, portfolio energy optimization, and similar evaluation processes into the FCI rating methodology. Develop and utilize a portfolio-wide energy model to identify and develop a portfolio-wide energy optimization investment plan as part of a broader energy supply transition planning effort, as recommended in the Renewable Energy action 2.1.2.

Cost Estimate: $200,000 per year

Cost Breakdown: Estimated $150,000–$200,000 per year funding plus staff resources to develop an independent portfolio-wide energy optimization investment plan or as part of a broader energy supply transition planning effort as recommended in the Renewable Energy section.

2.2.2 By FY2021, initiate electric passenger vehicle pilot programs for DASH, Alexandria City Public Schools, and the City vehicle fleet to evaluate costs, benefits, technical feasibility, and implementation opportunities to transition City fleet vehicles to electric vehicle technology, and install vehicle charging infrastructure at City facilities.

Cost Estimate: $150,000 per year

Cost Breakdown: A small-scale pilot of City passenger vehicles may be accomplished with $100,000–$150,000 for vehicle acquisition.

2.2.3

By FY2021, complete retrofits of 75 percent of all City facilities' practicable conventional lighting with light-emitting diode (LED) lighting. By FY2023 retrofit 95 percent of practicable streetlights and outdoor lighting to LED technology, subject to the availability of a suitable LED solution and zoning constraints.

Cost Estimate: Total estimated cost to retrofit practicable lighting is $7,800,000–$11,000,000.

Cost Breakdown: Retrofitting 75 percent of all remaining practicable conventional lighting in City facilities' and operations is estimated to be an additional $4,000,000–$5,500,000. Retrofitting practicable streetlights is estimated to be $5,550,000 ($1,750,000 for conventional roadway and traditional streetlighting and about $3,800,000 for Gadsby). Not all existing lighting is amenable for retrofit, either financially or technically.

Retrofitting 75 percent practicable conventional lighting at City facilities and operations is estimated to be a simple payback range of approximately 3–8 years. The estimated simple payback of retrofitting 100 percent of practicable streetlights is approximately 4–7 years. The Gadsby's make up 840 of ~10,000 lights and are custom poles and fixtures.

MID-TERM ACTIONS

2.2.4 By FY2027, implement energy efficiency strategies in City facilities and operations to reduce energy use by, at minimum, 25 percent over FY2018 usage.

Cost Estimate: $1,000,000–$3,000,000/year

Cost Breakdown: Assumes investing in energy efficiency actions that reflect non-lighting systems, including HVAC, hot water, etc., and includes whole-system redesign and replacement. Accounts for highest cost actions that have current-dollar simple payback ranging from 7–14 years. Does not reflect costs of building electrification conversions.

2.2.5 By FY2024, implement electrification of, at minimum, 25 percent of applicable non-electric passenger City fleet vehicles consistent with Fleet Replacement Plan criteria and scheduled replacement.

Cost Estimate: $150,000/year

Cost Breakdown: $150,000 per year currently serves as a placeholder as analysis is currently underway to determine the short-term and long-term incremental costs of replacing convention passenger vehicles with electric. These costs only reflect the incremental vehicle costs and do not include costs of charging infrastructure.

2.2.6 By FY2028, implement electrification of, at minimum, 10 percent of DASH, rapid transit routes, and King Street Trolley buses. Provide necessary electric vehicle charging infrastructure at City facility locations.

Cost Estimate: Not available at this time.

LONG-TERM ACTIONS

2.2.7 By FY2035, implement energy efficiency strategies in City facilities and operations to reduce energy use by, at minimum, 50 percent over FY2018 usage.

Cost Estimate: $2,000,000–$4,000,000/year

Cost Breakdown: Assumes investing in energy efficiency actions that reflect non-lighting systems, including HVAC, hot water, etc. and includes whole-system redesign and replacement. Accounts for highest cost actions that have current-dollar simple payback ranging from 14 – 21 years. Does not reflect costs of building electrification conversions.

2.2.8 By FY2040, implement electrification of all non-electric City vehicle fleets and include ACPS, DASH, rapid transit routes, heavy-duty equipment and vehicles. Provide necessary electric vehicle charging infrastructure at City facility locations. Hybrids will be used as an interim until electric vehicles can be substantially implemented.

Cost Estimate: Not available at this time.

Cost Breakdown: Cost estimates are not available as the cost and technology are rapidly changing. Further study is necessary to provide cost estimates. However, a one-time expenditure of $50,000 for evaluation of solid waste vehicles (does not include staff time) has been identified for a consultant study.

Legislative Priorities

1. Provide financial incentives to local governments, state agencies, and private owners of conventional roadway, street, and outdoor lighting to convert to dark-skies compliant LED technologies.
2. Commission a new study of energy efficiency potential to assess the scale, availability, and cost of energy efficiency as an economic, resiliency, and power generation resource in the Commonwealth of Virginia.
3. Direct the Virginia Department of Mines, Minerals, and Energy (DMME), State CorporationCommission (SCC), Virginia Department of Environmental Quality (DEQ), utility companies, and relevant stakeholders to pursue strategic partnerships with Virginia local governments to identify the needs, coordinate the deployment of public electric vehicle charging infrastructure, and incentivize the transition of personal-occupancy vehicles to electric vehicle technologies.

Energy

Justification

Energy efficiency and energy conservation implementation serves as a foundational practice for the City to offset greenhouse gas emissions. In addition, energy efficiency provides a reduction in energy use at a lower cost and higher return on investment than many alternatives and serves as a lower-cost pathway to offset the City's greenhouse gas emission by a renewable energy supply. Similarly, the electrification of the City's public and fleet transportation increases the energy efficiency of the fleet operations, and with support by renewable energy supply provides a pathway to offset the City's greenhouse gas emissions from transportation.

Accountable Parties

General Services (primary); Transportation and Environmental Services

2.3 COMMUNITY ENERGY USE

GOAL

Reduce greenhouse gas (GHG) emissions associated with community energy consumption in support of the City's global GHG emissions reduction goals

TARGET

Reduce greenhouse gas (GHG) emissions to at least 10 metric tons of CO2e per capita by FY2022, 6 by FY2030, 4 by FY2040, and 1-3 by FY2050 from a FY2005 base year

SHORT-TERM ACTIONS

2.3.1 By FY2019, expand participation in state-level policy and regulatory activities relevant to identifying and creating opportunities to reduce GHG emissions associated with community energy use. This should also include intervening in regulatory dockets related to the composition of the utility generation supply mix, utility energy efficiency programs, or utility rates.

Cost Estimate: One full-time equivalent (FTE) at $200,000 per year

Cost Breakdown: Depending on the necessary expertise and level of involvement, efforts may require external support including specialized legal counsel or technical experts. Based on past intervention efforts, these costs may range from an estimated $50,000/$500,000 per year.

2.3.2 By FY2020, adopt an ordinance that implements a Commercial Property Assessed Clean Energy (C-PACE) program to support sustainable economic development opportunities.

Cost Estimate: $75,000

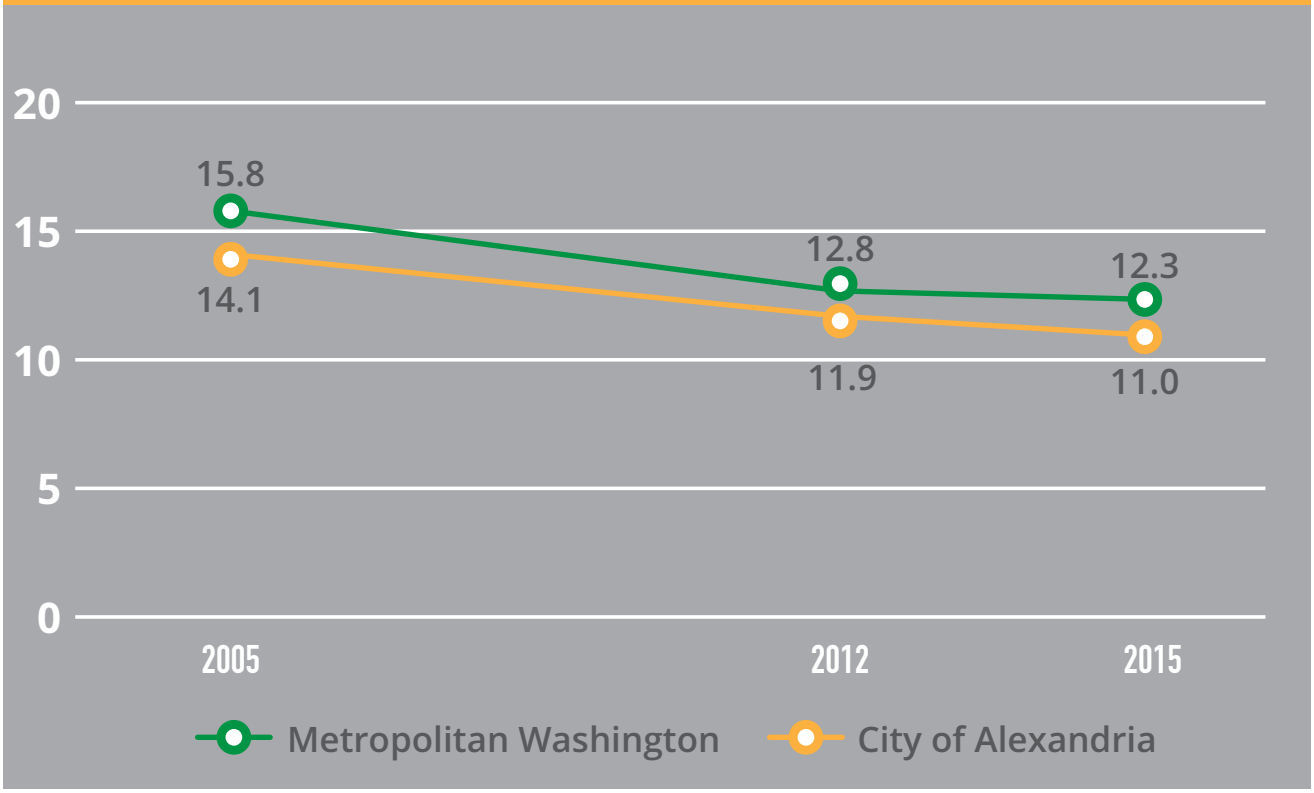
Cost Breakdown: Assumes operation by external administrator. Estimate 75 percent for program implementation and 25 percent ongoing program operation.

2.3.3 By FY2020, develop a strategy for community electric vehicle charging infrastructure.

Cost Estimate: $100,000

Cost Breakdown: Consultant engagement and strategy development are estimated to be $75,000–$100,000.

Per Capita Greenhouse Gas Emissions Trends



MID-TERM ACTIONS

2.3.4 By FY2024, develop a community energy model to track energy use and greenhouse gas reductions by various energy efficiency and renewable energy programs offered by the City and other partner organizations and to evaluate cost effectiveness and provide supporting information to optimize community energy use. The community energy model should reflect electrification transition from fossil fuels to electricity of private buildings, electrification in community vehicle use, mobility alternatives, and renewable energy supply implementation. The model should forecast energy use until at least 2040 and provide commensurate greenhouse gas emissions under various scenarios.

Cost Estimate: $100,000 initial + $10,000–$20,000/year to update

Cost Breakdown: Consultant engagement and community energy model development are estimated to be about $100,000. Annual updates are estimated to be $10,000–$20,000 per year.

LONG-TERM ACTIONS

2.3.5 By FY2040, implement policies and programs to support a full suite of community energy efficiency programs, building electrification, transition from fossil fuels, and community renewable energy supply.

Cost Estimate: $100,000–$10 million+/year

Cost Breakdown: Depends on the scope of the full suite of community energy efficiency programs. On the low end, $100,000 for program administration costs, and $10 million+ if financial incentives or related investments were to be offered.

2.3.6 By FY2029, implement and support the implementation of a publicly-accessible electric vehicle charging infrastructure that is supported by renewable energy supply.

Cost Estimate: Costs will be developed upon completion of electric vehicle charging infrastructure strategy. Where applicable, electric vehicle charging infrastructure provided by non-City entities will be prioritized.

Energy

Legislative Priorities

1. Pursue legislative opportunities to provide decarbonization via legal authority and implement a community solar or community choice aggregation-like program to provide subscription access to shared renewable energy facilities to Alexandria community members and businesses to offset individual or business GHG emissions from electricity use.
2. Identify state-level policy and regulatory activities relevant to identifying and creating opportunities to reduce GHG emissions associated with community energy use.
3. Lobby for bills that would expand renewable energy purchasing by the community or utility, advocate for the state of Virginia to join the Regional Greenhouse Gas Initiative (RGGI), set a renewable portfolio standard for electricity generation, and grant Alexandria authority to undertake energy and transportation initiatives to reduce GHG emissions that are currently prohibited by state law.

Justification

The goal, target and actions are consistent with the City's commitments to addressing climate change resulting from community energy consumption in support of City's global GHG emissions reduction goals. They are also consistent with the Metropolitan Washington Council of Governments (MWCOG) Regional Climate and Energy Action Plan. Engagement and programming to support the reduction of community energy use is essential to reducing the 96 percent emissions generated by the community.

Accountable Parties

General Services (primary); Transportation and Environmental Services

GREEN BUILDING

Green Building

The Green Building section's goal to optimize the economic, environmental, and social performance of new and existing buildings in the City of Alexandria is a multi-departmental effort to reduce GHG emissions and to improve air and water quality through development of greener buildings. The updated target and actions build on the successes of the 2009 Green Building Policy and the current standard development conditions which resulted in nearly 10 million square feet of green building built in the City, equating to approximately 95 percent of new development square footage in compliance with the policy.

The 2019 Green Building Policy[1] is the focus of the EAP 2040 Green Building section. The update of the Green Building Policy in June 2019 (a short-term action adopted in Phase One in October 2018) involves the coordination and expertise of the Green Building Policy Update Task Force in addition to the Departments of Planning & Zoning, General Services, Transportation & Environmental Services, Code Enforcement, Office of Housing and Office of Management and Budget.

The policy sets cutting-edge green building standards for new, large-scale private and public development, with the City leading by example through increased certification level of green building performance, plus an enhanced focus on net zero energy buildings, and overall reductions in energy use, stormwater treatment, improved water efficiency, and indoor environmental quality. The actions in this section coordinate with other EAP actions to evaluate and develop additional programs that incentivize green building, measure and monitor building performance and set a pathway to achieve net zero energy in new and existing City-owned buildings. The process and updated policy inform the short, mid, and long-term goals of this EAP section, contributing to overall City sustainability.

As most communities are primarily comprised of existing buildings, the performance characteristics of both new and existing buildings will have an impact long into the future. For the 2015 GHG inventory, existing buildings accounted for 57 percent of GHG emissions in the City.

1 Developers should review the online version of the Green Building Policy for any future updates at the City of Alexandria's Green Building webpage: https://www.alexandriava.gov/GreenBuilding."

3 Green Building

3.1. GREEN BUILDING POLICY

GOAL

Optimize the economic, environmental, and social performance of new and existing buildings in the City of Alexandria

TARGET

By FY2019, the Green Building Policy will set expectations for how both new and existing buildings should contribute toward achieving the goals for GHG emissions, water use, and stormwater runoff reduction established in the EAP, and by FY2020 will set forth a path for new city-owned buildings to meet a net zero energy standard. The City will maintain the same level of policy compliance as in the first decade since its adoption.

SHORT-TERM ACTIONS

3.1.1

Review the effectiveness of the current Green Building Policy and update the Policy in FY2019 with a focus on sustainable strategies that have the greatest impact toward achieving targets across EAP principle areas. The Task Force deliberations will inform the medium and long-term EAP actions for Green Buildings. Through this process, with support of third-party consultant analysis, the update will consider topics such as:

- Increasing LEED or equivalent third-party green building certification standards for private development;
- Establishing a separate green building standard, which includes evaluating the feasibility of a net zero standard where applicable, for new public development, including schools in collaboration with ACPS;
- Establishing incentives for private development participation in green building certifications, to achieve the quantifiable goals for GHG emissions and water use and stormwater runoff reduction established in the EAP;
- Prioritizing specific green building elements;
- Introducing mandatory and/or voluntary green building practices for existing buildings (including historic) and for small buildings not subject to site plan review;
- Instituting a building performance monitoring program;
- The City's ability to be more ambitious than the private sector in meeting green building goals to serve as a sustainability leader, and
- Establishing a Green Zone in the City per the legislative authority of 58.1-3854, Creation of local green development zones for tax incentives, permit fees, special zoning, and exemption from ordinances.

As part of this process, a Green Building Policy Update Task Force will be established by City Council. The Task Force, with critical input from the EPC and the development community, will determine the actual topics to be analyzed by the consultant.

Cost Estimate: $75,000

Cost Breakdown: The funds will be used for consultant studies on policy analysis on a cost analysis. Does not include staff time.

Green Building

3.1.2 By FY2020, evaluate additional sustainable features to incorporate into the "Building Section" of the standard development conditions for the Development Site Plans (DSP) and Development Special Use Permits (DSUP) that will contribute toward achieving targets across EAP principle areas.

Cost Estimate: Existing staff resources

3.1.3 By FY2023, update the Concept 2 Development Plan Checklist to include a requirement for a preliminary compliance narrative that indicates the applicant development team is aware of the City's Green Building Policy and understands how it is applied.

Cost Estimate: Existing staff resources

3.1.4 By FY2020, update checkpoints within the development review process to track compliance with the Green Building Policy.

Cost Estimate: Existing staff resources

3.1.5 By FY2023, update standard development conditions for projects subject to the new Policy to include the following topics:

- Staff access to post construction energy and water performance data
- Sub-metering of EV charging stations (so that whole-building metering is not affected)
- Consideration of energy metering in multifamily and hotel developments
- Consideration of enhanced commissioning measures in private development

Cost Estimate: Existing staff resources

3.1.6 By FY2023, establish a process for evaluating Net Zero Energy standards in new public buildings, including applicable guidelines, standards, and rating systems.

Cost Estimate: Existing staff resources

3.1.7 By FY2021, establish a new green building staff position in the Department of Planning and Zoning to work with the development community and property owners to support the implementation of the Green Building Policy.

Cost Estimate: $120,000

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.8 By FY2023, establish incentive programs that encourage green building renovations for existing buildings, such as encouraging property owners and leasing agents to participate in a Green Lease Leader program.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.9 By FY2023, evaluate regulatory incentives linked to specific green building performance measures for new private development:

- Establishing a City-wide Green Zoning Overlay (e.g., incentivizing solar panels and wind turbines through additional building height or allowing floor area exclusions to accommodate passive design elements).
- The feasibility of permitting bonus building height and density (once affordable housing bonuses are first exhausted) for applying green building practices above those outlined in the new Green Building Policy.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.10 By FY2024, complete a study of feasibility and methods to achieve net zero energy in existing building renovations, including the ability to achieve LEED Zero for LEED certified buildings or other applicable net-zero certifications.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

MID-TERM ACTIONS

3.1.11 By FY2028, establish a Performance Monitoring Program for private development as staffing resources become available to manage the Program and track green building certification through the development review process.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.12 By FY2028, evaluate the possibility of establishing a fee-in-lieu program for projects that are unable to comply with the Green Building Policy.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.13 By FY2028, establish a standardized process for NZE public buildings city-wide.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.14 By FY2028, investigate the feasibility of performance-based procurement for the NZE construction of public buildings.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

LONG-TERM ACTIONS

3.1.15 Schedule future administrative updates to the Green Building Policy to coincide with changes in third-party certification, the revisions to the state Building Code and the implementation of programs established through the EAP actions, with major updates for City Council every 5-7 years as needed. To maintain alignment with the intent of this Policy, Performance Points may be adjusted over time to correspond with updates to the rating systems, revisions to the building code, and/or updates to state, federal, or other City policies.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

3.1.16 By FY2029, establish the legislative, code, education, project support, incentives and verification infrastructure required to ensure that all new construction is carbon neutral by FY2030.

Cost Estimate: See action 3.1.7

Cost Breakdown: One FTE to implement and manage Actions 3.1.8 through 3.1.17

Green Building

Legislative Priorities

1. Enable local jurisdictions to require energy performance disclosure by private building owners and/or utility companies.
2. Advocate for local building code authority to create, implement, and enforce a local green building code.

Justification

Green building practices are an important instrument in reducing GHG emissions and energy use, potable water consumption, raw materials use, and waste output. Green Building methods also contribute to increased air quality, reduced storm water pollution, reduced energy demands, and economic sustainability.

Accountable Parties

Planning and Zoning (primary); General Services; Office of Housing; Code Administration; Transportation and Environmental Services (EV charging and stormwater); Office of Management and Budget (performance procurement process).

LAND USE AND OPEN SPACE

The City of Alexandria is committed to protecting and promoting public open space with a healthy tree canopy. It is an investment in a higher quality of life for residents, visitors, and future generations. The City seeks to protect public open space because:

- It connects the community: Our parks and facilities are the public's common ground that equitably bring together our vibrant and diverse community.
- It improves well-being: Our programs and facilities motivate the community to make healthy choices and live active lifestyles through all stages of life and at all levels and abilities.
- It is an investment in our environment: Our commitment to natural spaces provides physical, mental, and community benefits, while offering opportunities to engage with and conserve our natural resources.

The City achieved a tree canopy of 36 percent in 2016 and has planted about 800 trees per year over the last several years. It also exceeded the 2009 goal of acquiring 100 new acres of open space and maintained a ratio of 7.3 acres of open space per 1,000 residents.

The EAP 2040 actions align with the Open Space Master Plan (2003, updated 2017) and the Recreation, Parks and Cultural Activities Strategic Plan to increase the tree canopy to 40 percent by 2035. The Department of Planning and Zoning development process supports the tree canopy and open space goals of this section and balances the private and public open space needs in Small Area Plans and in private and public development and non-development projects.

4 Land Use and Open Space

4.1 TREE CANOPY

GOAL

Preserve and expand a healthy urban tree canopy

TARGET

By FY2035, average overall tree canopy will be a minimum of 40 percent

SHORT-TERM ACTIONS

4.1.1 By FY2023, update and coordinate the Urban Forestry Master Plan, Environmental and Sustainability Management System (ESMS), and Landscape Guidelines (updated in FY2019) to support increased tree preservation, expansion, maintenance, native species use, and a revised tree canopy coverage goal.

Cost Estimate: $40,000 per year

Cost Breakdown: $30,000–$40,000 per year. $30,000 for the yearly tree inventory study plus $10,000 for the tree canopy survey scheduled for every three years.

4.1.2 By FY2023, enlist City partnerships (community groups) to provide education and outreach to provide technical assistance and opportunities to increase native tree canopy coverage on private property.

Cost Estimate: Existing staff resources

4.1.3 By FY2028, develop an urban forest health index rating system to determine the current and ongoing health and health needs of the urban forest in Alexandria.

Cost Estimate: $100,000

4.1.4 By FY2028, develop a program that supports the planting of trees on private property, commit funding to establish the program and support ongoing implementation.

Cost Estimate: $25,000/year

LONG-TERM ACTIONS

4.1.5 By FY2029, update the Urban Forestry Master Plan to support increased tree preservation, expansion, maintenance, native species use, and a revised tree canopy coverage goal.

Cost Estimate: $30,000

4.2 OPEN SPACE

GOAL

Increase open space quantity and improve the environmental quality, management, and social benefits of open space

TARGET

Maintain the ratio of 7.3 acres of publicly accessible open space per 1,000 residents

SHORT-TERM ACTIONS

4.2.1 By FY2023, protect and add open space through acquisition, preservation, and conservation as prescribed in the Open Space Master Plan (updated 2017) and by FY2023, evaluate increasing the target to 7.5 acres per 1,000 residents. This includes, by FY2020, City Council will re-establish the open space steering committee to re-assess the methodology, evaluate, and prioritize potential open space sites. Tools to be considered for open space preservation or restoration will include the purchase of easements or repurposing land as funds can be made available, development occurs, or partnerships can facilitate.

Cost Estimate: The proposed FY20-29 CIP provides $13,175,000 for Open Space acquisition and development. Any proposed changes to this funding will be evaluated through the Open Space Steering Committee's action findings.

Cost Breakdown: The action is also dependent on the development envisioned in small area plans, including city investments, developer contributions, and private philanthropic contributions.

4.2.2 By FY2023, increase the percentage of acres of public natural lands that are actively managed, including restoration and invasive species removal, by 50 percent to 450 acres.

Cost Estimate: Existing staff resources

4.2.3 By FY2020, evaluate and update, using a public process, the requirements of open space on residential, commercial and mixed-use private development. Issues to be addressed include how to achieve meaningful and publicly accessible open space, particularly at the ground level; how to value developer contributions to off-site open space; how to minimize impervious surfaces; how to align vegetation requirements with canopy and native species goals in the Landscape Guidelines; and; how to ensure consistency of open space requirements across similar zones.

Cost Estimate: Existing staff resources

MID-TERM ACTIONS

4.2.4 By FY2028, identify tools and techniques through stream valley plans to maintain and enhance all of the City's stream valleys including public access points for ecological and recreational benefits. The plans will be updated every 10 years.

Cost Estimate: $250,000/10 years (new request)

Cost Breakdown: Based on previous similar plans. Note that this does not include plan implementation which will be determined based on findings of the plan.

MID-TERM ACTIONS

4.2.5

By FY2028, seek publicly accessible open space opportunities in unconventional spaces:

a. Further evaluate the City's network of public alleys and define those most appropriate for informal recreational use and/or green infrastructure improvements.
b. Work with Northern Virginia Conservation Trust to identify potential locations for conservation easements, particularly those that would connect or are adjacent to existing open spaces.
c. Identify and map opportunities to re-purpose public rights-of-way and parking lots for other public uses, including interim and/or permanent recreational use and open space, affordable housing, schools, or other public facilities.
d. Protect and preserve institutional open space by:
    i. Pursing easements for trails and/or ecosystem corridors through institutional space to connect with public open space.
    ii. Develop mechanisms, possibly including incentives, for public/private partnerships to maintain and enhance natural areas on institutional land

Cost Estimate: $60,000/year (part of approved CIP)

Cost Breakdown: The City currently holds a contract with Northern Virginia Conservation Trust to advise on open space concerns and these action items can be added to our joint work plan.

Justification

A healthy and diverse urban forest canopy coverage in Alexandria provides a broad range of environmental and social benefits such as reduced GHG emissions, improved air quality, enhanced property values, stormwater and flood mitigation, public health benefits, and vibrant public spaces. The reduction of GHG emissions improves air quality and contributes to health and wellness.

Legislative Priorities

Advocate for state legislation that would enable the City to expand tree protection and preservation and to increase tree canopy requirements.

Accountable Parties

Recreation, Parks and Cultural Activities (primary); Planning and Zoning, Transportation and Environmental services.

SOLID WASTE

Solid Waste

Solid waste removal is one of the City's most important regulatory responsibilities and core services. In 2009, when the original EAP was written, the City's recycling rate was 28.7 percent. The recycling rate has been above 48 percent since 2011, well above the state minimum requirement of 25 percent and above state average rate of 43 percent. Solid waste processing contributes only two percent of the City-wide GHG emissions. The calculations include the impact of the waste-to-energy plant (COVANTA) that generates electricity from trash instead of emissions from a landfill.

In recent years, the global recycling market has experienced tremendous pressures due to a series of recycling policies implemented by China, the largest importer of scrap materials. To consider how Alexandria should adapt to these pressures, staff began an extensive public engagement process, including the Environmental Policy Commission, to understand and incorporate our customers' needs, values and priorities. In July 2017, staff also retained an independent consultant to conduct a third-party evaluation of the City's current waste management programs and provide recommendations for future long-term management strategies. The results are documented in the City's 20-year strategic plan for solid waste, WasteSmart.

The actions in the EAP 2040 and the WasteSmart Strategic Plan address significant changes for managing solid waste going forward. Implementation of the EAP 2040 action 5.1.1 include new options for glass only bins at the four City recycling drop-off centers and in partnership with a neighboring jurisdiction to turn glass into gravel and sand. This reduces emissions and costs from processing glass in the mixed recycling stream, provides a local use for glass, and can replace some of the non-local resource needs for gravel and sand.

5 Solid Waste

5.1 RECYCLE

GOAL

Recover resources and reduce GHG emissions and other forms of pollution by optimizing and safely handling the collection and processing of solid waste

TARGET

By FY2023, establish a FY2019 GHG emissions base year for the collection and processing of solid waste, measure emissions at least annually, and reduce the emissions rate by at least 12 percent

SHORT-TERM ACTIONS

5.1.1 In FY2020, install special containers for glass only recycling at all recycling drop-off centers to improve the recyclability of glass. In FY2021, if no environmentally and economically justifiable alternative has been identified for recycling glass placed in the single stream, begin to phase out glass from single stream recycling and temporarily reset the City's recycling goal accordingly.

Cost Estimate: $40,000 per year for glass drop-off centers.

Cost Breakdown: Estimate includes containers, plus labor for collection, processing, and administrative fees.

5.1.2 In FY2019, launch a "Recycle Right" education campaign to promote and define recycling best practices with a focus on reducing contamination of recyclables, discouraging the disposal of recyclables inside plastic bags, and maximizing the reduction in GHG emissions.

Cost Estimate: $80,000 per year

Cost Breakdown: Will be built on the existing recycling campaign. Annual fee will be for program administration.

5.1.3 By FY2020, conduct a Route Optimization Study to perform a review of the current truck routing, mileage, staffing levels, homes served per route and tonnages of trash collected. Ensure that routes are performed in the most efficient, economical manner, and maximize the reduction in GHG emissions.

Cost Estimate: $100,000

Cost Breakdown: Maximum of $100,000. The funds will be used for consultant studies. Does not include staff time.

5.1.4 By FY2021, review and update the City's recycling ordinance to reflect changes in the global recycling market and to prioritize recycling practices that maximize the reduction in GHG emissions.

Cost Estimate: $14,400

Cost Breakdown: Includes staff time (320 hours over a two-month period)

5.1.5 By FY2020, the City's food waste composting program will result in a net reduction in GHG emissions.

Cost Estimate: Total costs of proposed actions will be developed as part of plan development process

MID-TERM ACTIONS

5.1.6 By FY2028, evaluate public space trash and recycling bins and make recommendations for optimizing routes and other operational changes.

Cost Estimate: $75,000

Cost Breakdown: The funds will be used for consultant studies.

5.1.7 By FY2028, review commercial recycling requirements to improve resource recovery in the commercial sector. Evaluate for recycling capacity, convenience, signage, number and type of recyclables required to be recycled, education, outreach, and information required for Recycling Implementation Plan form.

Cost Estimate: $14,400

Cost Breakdown: Includes staff time (320 hours over a two-month period)

5.1.8 By FY2028, evaluate organics processing market readiness and feasibility of curbside organics collection.

Cost Estimate: $75,000–$100,000

Cost Breakdown: The funds will be used for consultant studies.

LONG-TERM ACTIONS

5.1.9 Complete a regional comprehensive alternative disposal study. Evaluate long-term end disposal options, knowing that significant time will be needed for any potential planning and implementation.

Cost Estimate: $75,000–$150,000

Cost Breakdown: The funds will be used for consultant studies.

Justification

In January 2019, City Council unanimously adopted the WasteSmart Strategic Plan to sustainably recover resources. This plan was adopted utilizing the values of the triple bottom line of economics, community values, and environment. The WasteSmart Plan and the EAP aims to reduce greenhouse gas emissions and improve the quality of collected recyclables in response to a more restrictive global recycling market. Action items identified in this section were selected from the WasteSmart Plan that supported this goal. Furthermore, as over 70 percent of the City's waste stream is from the commercial and multi-family sector, an action item addressing commercial recycling requirement is in the EAP.

Accountable Parties

Transportation and Environmental Services (primary)

5.2 REDUCE

GOAL

Reduce total solid waste collected from City-served residential customers

TARGET

By FY2023, reduce the total solid waste per household collected from city-served residential customers by five percent as compared with a base year of FY2018

SHORT-TERM ACTIONS

5.2.1 In FY2019, develop online directory for reuse (consign), donation, repair and include the District of Columbia, Maryland, and Virginia to encourage residents and businesses to prevent waste and reuse existing materials.

Cost Estimate: Existing staff resources

5.2.2 By FY2021, evaluate and make a recommendation to Council on whether to initiate variable-rate pricing for solid waste collection services to reduce waste and provide greater economic equity for residents.

Cost Estimate: $100,000 (does not include staff time).

Cost Breakdown: The funds will be used for consultant studies.

5.2.3 By FY2020, pilot a Share-A-Bag program to encourage residents to use reusable bags over disposable plastic bags.

Cost Estimate: $3,000 per year

MID-TERM ACTIONS

5.2.4 By FY2028, support reduction, reuse and recovery of building material by working with regional partners to keep the Builders Recycling Guide up-to-date and share resources with commercial developers.

Cost Estimate: Existing staff resources are accounted for in current budget.

LONG-TERM ACTIONS

5.2.5 Work with surrounding jurisdictions to develop and implement a regional approach to reducing plastic waste.

Cost Estimate: Existing staff resources

Cost Breakdown: Total costs of proposed actions will be developed as part of plan development process.

5.2.6 Establish sustainable purchasing guidelines to include sustainability issues such as recycled content and chemical evaluation. Purchasing guidelines would be coordinated with all City departments.

Cost Estimate: Existing staff resources

Legislative Priorities

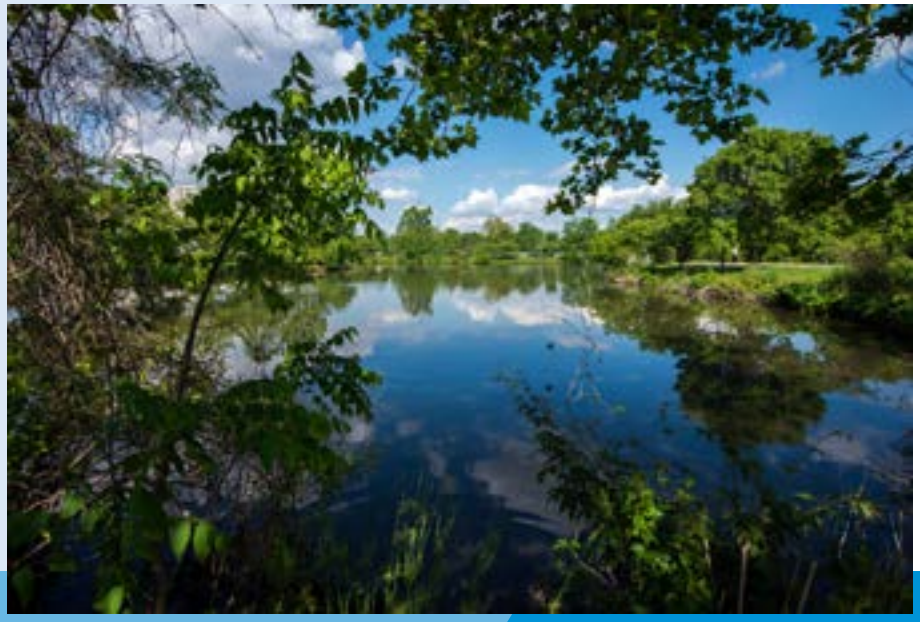
Support the development of a legislative proposal that would authorize the City to enact a deposit program for glass containers (i.e., a "bottle bill") and to control the sale of disposable plastic bags (i.e., "bag law" or "plastic bag tax") in collaboration with neighboring jurisdictions.

Justification

Reducing waste and reusing are the most effective ways to save natural resources, protect the environment, and reduce costs. Reducing waste also supports the goal of reducing greenhouse gas emissions because it reduces the amount of waste that needs to be sent to disposal facilities as well as preventing the need to harvest new raw resources. These actions provide opportunities for reuse prior to entering the waste stream and leverage regional resources and expand relationships with regional partners, agencies, and improve outreach to residents and local businesses.

Accountable Parties

Transportation and Environmental Services (primary); Parks, Recreation, and Cultural Activities; Purchasing



WATER RESOURCES

Water Resources

Water is essential for human life and has significant impacts on the economy and wellbeing of a community particularly in the City of Alexandria that has a deep history as a river town associated with the Potomac River. Managing water resources in a dense urban community in a sustainable manner is both vital and challenging. The City has prioritized the protection of its water resources, recognizing them as a fundamental element of the quality of life in the community and an integral part of the City's thriving economy. The City has embraced "One Water" approach that integrates management of safe drinking water, stormwater, and wastewater resources in a sustainable manner.

The City's drinking water is sourced from the Potomac River and Occoquan Reservoir by Fairfax County Water Authority for treatment and supplied via Virginia American Water Company. The City's wastewater is collected through City maintained collection system and is conveyed to either Alexandria Renew Water Resource Recovery Facility or Arlington Water Pollution Control Plant. Most of the City's stormwater drains into local waterways that drain into the Potomac River and Chesapeake Bay.

The City's water resources are heavily regulated by state, federal, and local requirements such as the Chesapeake Bay Total Maximum Daily Load (TMDL), Virginia Stormwater Laws, and state legislation requiring remediation of the Combined Sewer Overflow (CSO) outfalls by 2025. More importantly, the City has prioritized the protection of its water resources recognizing them as a fundamental element of the quality of life in the community and an integral part of the City's thriving economy.

As the City continues to grow, planning for development activities and infrastructure improvements are critical to protecting and improving water resources, reducing water use, enhancing water related recreation, and mitigating instances of flooding to protect property. Ultimately, the City strives to achieve water quality that is fishable and swimmable.

Managing stormwater helps to improve water quality, mitigate the effects of climate change, and improve the City's climate resiliency by reducing stormwater runoff volumes, recharging groundwater, reducing the urban heat island effect, and lowering energy demands through the use of green roofs. Water conservation and gray water or wastewater reuse reduces energy consumption required for treatment processes, distribution, and collection.

Through its Chesapeake Bay Action Plan, Municipal Separate Storm Sewer System (MS4) Program Plan, Virginia Stormwater Management Program Implementation, Long Term Control Plan for combined sewer system, future planning initiatives such as an update to the Sanitary Sewer Master Plan, and creation of a Stormwater Management Master Plan, the City continues to protect its waterways. As of 2018, the pollution reduction for phosphorus was 40 percent and is targeted to achieve 70 percent by 2023. Dedicated funding through the Stormwater Utility Fee and Sanitary Sewer Fees provide for implementation of these coordinated plans to provide environmental health, recreational and other beneficial uses of the City's waterways.

6 Water Resources

6.1. ENHANCEMENT AND RESTORATION

GOAL

Make Alexandria's waterbodies fishable and swimmable

TARGET

Stormwater will be managed to enhance the quality of local waterways and their ecological, public health, social, and economic benefits, by meeting 70 percent of the City's Chesapeake Bay phosphorus pollution by 2023 ahead of the regulatory requirement

SHORT-TERM ACTIONS

6.1.1 By FY2023, achieve the state and federal mandated nutrient and sediment pollution reductions using the strategies in the Chesapeake Bay Total Maximum Daily Load (TMDL) Action Plan. Exceed the cumulative 40 percent reductions in the 2018 – 2023 MS4 permit to include design and construction of the Ben Brenman / Cameron Station Pond Retrofit and the Lucky Run Stream Restoration.

Cost Estimate: $6,100,000

Cost Breakdown: $4,200,000 to fund the design and construction of the Ben Brenman Pond Retrofit and $1,900,000 to fund the design and construction of Lucky Run Stream Restoration identified in the 10-year CIP. Does not include staff time and effort in developing the Phase 2 Bay TMDL Action Plan.

6.1.2 By FY2021, hire an environmental educator to create and implement educational water resources programs targeted to students and adults.

Cost Estimate: $145,000/year

Cost Breakdown: $120,000/year for a full-time equivalent staff person initially and increasing annually; $25,000/initial year startup; with $10,000/year thereafter for educational supplies.

6.1.3 By FY2020, create a green infrastructure policy document that details implementation of the citywide approach as policy for implementation of green practices to reduce pollution in urban stormwater while delivering other environmental, social, economic and public health co-benefits, such as habitat creation, reduced heat island effect, and the creation of green spaces to enhance the quality of life.

Cost Estimate: $50,000

Cost Breakdown: Cost includes contractor policy development.

MID-TERM ACTIONS

6.1.4 By FY2025, achieve 100 percent of the state and federal nutrient and sediment pollution reductions using the strategies in the Chesapeake Bay TMDL Action Plan.

Cost Estimate: $6,100,000

Cost Breakdown: Approximately $1,600,000 planned for Strawberry Run Stream Restoration design and construction and approximately $4,500,000 for Taylor Run Stream Restoration design and construction identified in the FY2020-FY2029 CIP. Does not include staff time and effort in developing the Phase 3 Bay TMDL Action Plan.

6.1.5 By FY2024, develop a Green Infrastructure Program Plan to prioritize projects, increase green infrastructure projects on public and private property, and promote green infrastructure as the leading approach for stormwater management in the City.

Cost Estimate: Estimated $350,000

Cost Breakdown: Estimated cost of identifying and prioritizing projects for further design and construction identified in the 10-year CIP.

LONG-TERM ACTIONS

6.1.6 By FY2030, develop a Stream Assessment (Phase IV) to prioritize improvement of local waterways for stabilization and restoration of existing natural streams, along with a consideration of daylighting streams where feasible, with a focus on increased access and recreational opportunities.

Cost Estimate: Estimated $350,000

Cost Breakdown: Estimated cost of identifying and prioritizing projects for further design and construction pending capital improvement funding

6.1.7 By FY2029, identify 20 percent of existing proprietary stormwater management devices on City properties as candidates for green infrastructure retrofit opportunities.

Cost Estimate: Cost will be substantiated following development of the plan.

Legislative Priorities

Expand the Virginia Stormwater Best Management Practice (BMP) Clearinghouse list of accepted stormwater quality Best Management Practices to provide localities greater flexibility for development and redevelopment projects, and overall to meet the Chesapeake Bay Total Maximum Daily Load (TMDL) cleanup mandates.

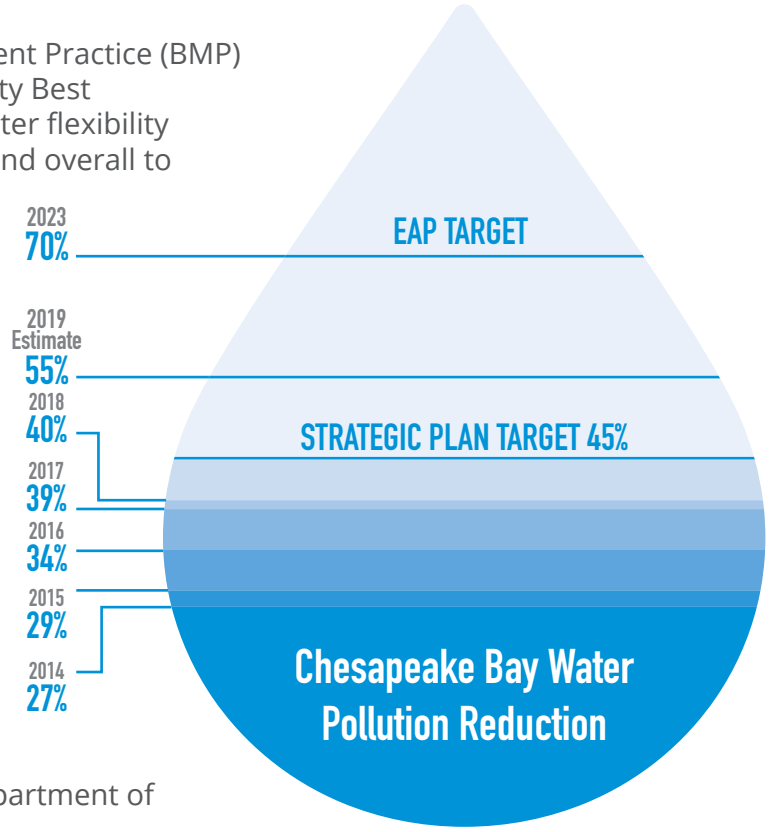
Establish a grant program funded by the City to provide reimbursement to property owners for the installation of BMPs on private property.

Justification

Protecting natural systems through investigation, prioritization and enhancement of the built environment protects natural resources, mitigates adverse impacts, and improves quality of life.

Accountable Parties

Transportation and Environmental Services, Department of Project Implementation, Recreation, Parks, and Cultural Activities.



Percent of the Chesapeake Bay Water pollution reduction goal completed each year

6.2. ONE WATER INFRASTRUCTURE

GOAL

Ensure safe and adequate infrastructure for drinking water supply, stormwater management, and wastewater treatment

TARGET

Meeting current and future, regulatory and infrastructure demands through planning, coordination, and implementation resulting in a safe and adequate drinking water supply, reduced risk of flooding, and improved water quality

SHORT-TERM ACTIONS

6.2.1 By FY2022, prepare a plan to improve our National Flood Insurance Program Community Rating System score from a 6 to a 5 to reduce flood insurance rates as the first '5 rated community' in the region for property owners.

Cost Estimate: $350,000/year

Cost Breakdown: Cost includes estimate from Code Administration for maintenance of the Building Code Effectiveness Grading Schedule (BCEGS) and participation in updates to the Northern Virginia Regional Commission (NVRC) Hazard Mitigation Plan and process.

6.2.2 By FY2022, develop the preliminary prioritization for nuisance drainage projects and by FY2023 develop the Drainage and Flooding Projects Prioritization Plan to manage major capital construction projects.

Cost Estimate: $450,000

Cost Breakdown: Analysis, modeling and mapping, and project prioritization identified in the proposed FY2020-FY2029 CIP.

6.2.3 By FY2023, educate businesses and homeowners in water conservation practices and consider an incentive program (e.g., rebates, fees reductions or tax breaks), and provide outreach to the general public.

Cost Estimate: $25,000–$40,000/year

MID-TERM ACTIONS

6.2.4 By FY2025, work with Alexandria Renew (wastewater treatment) to implement the Long-Term Control Plan through the RiverRenew initiative that addresses all four combined sewer outfalls and minimizes combined sewer overflows (CSOs).

Cost Estimate: $370,000,000–$550,000,000

Cost Breakdown: Planning, design, and construction funded through AlexRenew funding.

6.2.5 By FY2028, explore a reclaimed wastewater reuse partnership between the City and Alexandria Renew, including updating the technical and economic feasibility study for using reclaimed wastewater for irrigation of some of the larger open spaces in the city.

Cost Estimate: $100,000

Cost Breakdown: Updating the previous study and coordinate with AlexRenew.

6.2.6 By FY2028, collaborate with Virginia American Water and regional partners to monitor, evaluate, and ensure safe and adequate water supply for the City now, and in the future.

Cost Estimate: $10,000–$25,000

Cost Breakdown: Required costs will be absorbed within City's operating budget

LONG-TERM ACTIONS

6.2.7 By FY2030, create a stormwater management master plan as an update to the Water Quality Management Supplement to Alexandria's Master Plan, as a comprehensive approach to addressing water quality and quantity issues. The update to the Alexandria Master Plan will act as the guide for future stormwater management and prioritization of efforts to increase the ecological, public health, social, and economic benefits of local waterways while mitigating the impacts of flooding and drainage issues. The successful implementation of this plan will integrate stormwater management into the City's overall planning efforts to preserve and enhance the character of the City.

Cost Estimate: $350,000

Cost Breakdown: Plan will incorporate work done in other efforts as chapters to this section of the Alexandria Master Plan, such as the updates to the Storm Sewer Capacity, the Drainage and Flooding Prioritization Plan, and the Green Infrastructure Program Plan that will be funded through no change to the FY2020-FY2029 CIP.

Water Resources

Legislative Priorities

Seek state and federal grant funding to offset the cost of implementation of Combined Sewer System Long-Term Control Plan and burden on City rate payers.

Justification

Comprehensive water resource infrastructure, education, planning and project implementation ensures the City can meet the communities current and future needs for water, wastewater and stormwater management.

Accountable Parties

Transportation and Environmental Services and Alexandria Renew Enterprises, Code Administration

TRANSPORTATION

Transportation

Transportation is essential. It is the way people access jobs, shopping, parks, and other destinations. However, the way people and goods move can negatively impact health and air quality, and can contribute to greenhouse gases emissions which ultimately worsens climate change. Making transportation more efficient and less carbon-intensive can provide important economic, social and environmental benefits.

The City of Alexandria's transportation sector has an emissions contribution of 36 percent, which is higher than the national average of 28 percent[1] but reflects minimal industrial contributions in the City. Reducing single-occupant vehicle driving (SOV), and promoting sustainable modes of transportation like walking, biking and public transit can help people reduce greenhouse gas emissions, improve air quality, and promote land uses that further reduce carbon emissions.

The City has made significant progress in the transportation sector as a direct result of the recommendations from the EAP 2030. These improvements include:

- Crystal City – Potomac Yard Metroway provides a more frequent transit service using dedicated lanes and limited stops for faster service.
- Complete Streets Guidelines enables safe access for all users regardless of age, ability, or mode of transportation; an expansion of the bicycle and pedestrian network for safer low-carbon travel options; and successful implementation of Capital Bikeshare.

These accomplishments have helped the City surpass the original EAP's 2020 targets for increases in transit ridership and reduced vehicle miles traveled (VMTs), In fact, Alexandria's VMTs reduced by 12.5 percent between 2010 and 2016, the greatest drop in the region.

The new VMT target ensures that the City continues to make significant progress on increasing low carbon travel, improving air quality, and reducing carbon emissions.

By funding and implementing the City's Complete Streets and Vision Zero programs, developing the Alexandria Mobility Plan (update to the 2008 Transportation Master Plan), and building synergies with other recommendations such as fleet electrification, transportation can help meet new goals and targets in Climate Change, Energy, Land Use and Open Space, Air quality, and Environmental Health.

1 https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions

7 Transportation

7.1 PRIORITIZING LOW-CARBON MOBILITY OPTIONS

GOAL

Aggressively promote vibrant, human-scale city streets that prioritize people's access and mobility so that all Alexandria residents and visitors have access to the commercial and cultural resources of the city using low-carbon modes of transportation, consistent with the following level of precedence: pedestrians, bicyclists, public transportation, shared motor vehicles, freight vehicles and private motor vehicles

TARGET

By FY2023, reduce total average vehicle miles traveled (VMT) per capita by at least 1 percent per year and determine the amount of carbon reduction from transportation sector

SHORT-TERM ACTIONS

7.1.1 By FY2023, complete all engineering and education actions outlined in the 2017 Vision Zero Action Plan. These actions increase safety and encourage pedestrians, bicyclists, and public transit riders to use Alexandria's streets.

Cost Estimate: $1,000,000–$5,000,000

7.1.2 By FY2023, add an average of 3 miles of bicycle connections per year, prioritizing low-stress facilities, where possible, and connectivity with existing bicycle infrastructure, to create a network of bike-safe routes.

Cost Estimate: $200,000–$400,000

7.1.3 By FY2023, develop a checklist for transportation staff working on development review to be used in both residential and commercial review processes to incentivize less carbon-intensive modes of transportation and mobility options.

Cost Estimate: Existing staff resources

7.1.4 By FY2023, adopt permanent regulations for shared mobility devices such as dockless bikes, electric scooters, and other personal mobility devices.

7.1.5 By FY2021, develop a plan to acquire zero emissions buses on rapid transit routes and conversion of DASH fleet to zero emissions.

Cost Estimate: $100,000–$300,000

7.1.6 By FY2023, determine the feasibility of a low-stress multi-modal, connective bicycle network to increase bicycle mode share.

MID-TERM ACTIONS

7.1.7 By FY2028, complete the bicycle and pedestrian projects prioritized in the pedestrian and bicycle chapters of the Alexandria Mobility Plan (formerly known as the Transportation Master Plan).

Cost Estimate: $5,000,000–$10,000,000

7.1.8 By FY2025, implement the 2017 walk audit recommendations for all schools.

Cost Estimate: $2,000,000 – $5,000,000

Legislative Priorities

1. Encourage statewide legislative efforts to implement stricter traffic safety laws as mandated by the 2017 Vision Zero Action Plan. Alexandria should continue to lobby the state to allocate road funding to local jurisdictions based not on car driving lanes but to adequately fund infrastructure for bicycles, pedestrians, and other low-carbon mobility options.
2. Support federal, state, and regional compacts and initiatives to reduce transportation-related greenhouse gas emissions, including support of the Transportation and Climate Initiative.

Justification

By incentivizing and regulating mobility options, short automobile trips can be replaced with other less carbon-intensive modes of transportation while maintaining safety and providing mobility and access. Furthermore, by increasing safety on City streets, the share of walking and bicycling trips can increase moderately.

Accountable Parties

Transportation and Environmental Services

7.2 REDUCE AUTOMOBILE DEPENDENCY

GOAL

Reduce automobile dependency and educate individuals and employers on mobility options other than single-occupancy driving

TARGET

By FY2023, increase the share of all trips taken by public transit, walking and biking by at least 15 percent taking the 2018 Mobility Survey as the base year

SHORT-TERM ACTIONS

7.2.1 By FY2023, develop a stand-alone Transportation Demand Management (TDM) Chapter in the Alexandria Mobility Plan (formerly the Transportation Master Plan) to promote low-carbon modes of transportation.

Cost Estimate: $50,000–$100,000

7.2.2 By FY2023, finalize construction of the Potomac Yard Metrorail station.

Cost Estimate: $370,000,000

MID-TERM ACTIONS

7.2.3 By FY2028, encourage people who work in Alexandria to use sustainable mobility options by developing policies that discourage employee parking (e.g., eliminating monthly parking subsidies, prohibiting retail employees to park long term at parking meters and provide cash incentives in lieu of providing employees free parking).

Cost Estimate: $1,000,000–$5,000,000

Legislative Priorities

1. Advocate for the state to both raise the gasoline tax and to allow local jurisdictions more flexibility in raising gasoline taxes.
2. Advocate for the state to have car property taxes to be assessed with an efficiency bonus/penalty and not just on the value of the vehicle.

Justification

At the National level, approximately 30 percent of combustion related GHG comes from the transportation sector. In the City, transportation is 36 percent for the 2015 inventory. It is important to reduce automobile dependency in order to reduce GHGs that contribute to global warming and pollutants that have been linked to negative health outcomes.

Accountable Parties

Transportation and Environmental Services

7.3 IMPROVE, EXPAND AND INTEGRATE PUBLIC TRANSIT SYSTEMS

GOAL

Improve and expand Alexandria's public transit system so that passenger rail and bus systems are safe, reliable, accessible, convenient, attractive, efficient, and equitable

TARGET

By FY2030, double the miles of dedicated bus infrastructure to at least 1.5 miles

SHORT-TERM ACTIONS

7.3.1 By FY2023, deploy a regionally-integrated, mobile-friendly platform that provides real-time trip information and fare payment capabilities for all multimodal trip options to make travel seamless for people across different regional transit providers.

Cost Estimate: $1,000,000–$5,000,000

MID-TERM ACTIONS

7.3.2 By FY2028 expand bus rapid transit by doing design, environmental work, right of way, and construction for West End Transitway, completing the design and Right-of-Way for the Duke Street Transitway, and extend Route 1 Metroway.

Cost Estimate: $150,000,000

Cost breakdown: $75,000,000,000 for design and right of way and construction of Phase 1 (TSM scenario) and an additional $50,000,000 for adding dedicated lanes (Phase 2 – Full Build), and $15,000,000 for design / ROW for Duke Street Transitway, and $10,000,000 for Metroway extension

LONG-TERM ACTIONS

7.3.3 By FY2040, expand bus rapid transit with construction for Duke Street Transitway.

Cost Estimate: $115,000,000–$140,000,000

Accountable Parties

Transportation and Environmental Services

ENVIRONMENTAL HEALTH

The purpose of the Health Department's Environmental Health Division is to ensure the health and safety of our community by providing health education, working with regulated facilities to achieve regulatory compliance and promoting health and safety through public outreach. The Environmental Health Division's focus in the Environmental Health section of the EAP 2040 is to address the concerns affecting the health and safety of the citizens of Alexandria. Specific actionable goals will be determined from the results of the Environmental Health Assessment, which will allow the community to identify environmental success stories and opportunities for health improvement in the city.

8 Environmental Health

8.1. COMMUNITY HEALTH PRIORITIES

GOAL

Explore the broad physical and social environments that are impacting Alexandria's health and safety and develop an action plan using the Protocol for Assessing Community Excellence in Environmental Health

TARGET

By FY2023, create an updated Community Environmental Health Assessment with an accurate and verifiable status of the Community's Environmental Health

SHORT-TERM ACTIONS

8.1.1 By FY2021, create a cross-agency implementation team to develop a new Environmental Health Assessment of the City based on principles contained within the National Association of County and City Health Officer's (NACCHO) Protocol for Assessing Community Excellence in Environmental Health methodology.

Cost Estimate: $100,000/year

Cost Breakdown: Approximately $100,000 for a consultant to start the planning process and develop a Community Based Assessment team to complete the next stage of the Assessment.

MID-TERM ACTIONS

8.1.2 By FY2024, create a comprehensive action plan to address the greatest issues of concern for Alexandria based on community input through the Environmental Health Assessment.

Cost Estimate: $100,000/year

Cost Breakdown: Approximately $100,000 for a consultant to start the planning process and develop a Community Based Assessment team to complete the next stage of the Assessment.

8.1.3 By FY2025, create a list of actionable goals to address the issues of highest concern as identified by the community of Alexandria.

Cost Estimate: This will depend on the issues identified and potential actions required. Additionally, it will require a consultant to oversee the implementation of the action plan and to report progress on achieving these goals.

LONG-TERM ACTIONS

8.1.4 By FY2030, conduct an annual review of progress made towards achieving these goals and be working towards a repeated assessment to determine community benefit and reset goals for the next EAP update.

Justification

The last Environmental Health Assessment was started in 2002 and published in 2007. Since then limited work has been conducted to ensure that the issues highlighted are still relevant to the Alexandria Community. This assessment will create a new benchmark that addresses the needs of today's community in light of the changing Public Health climate based on new science and technologies.

There is a real lack of data on what Environmental Health issues are impacting the lives of the Alexandria community. By completing the assessment, we will be able to target limited resources at environmental health issues that are a genuine concern to the community and that are supported by scientific data as having a real health impact.

Accountable Parties

Department of Housing, Code Administration and Health Department (Primary).

8.2. INDOOR AIR QUALITY

GOAL

Create a City-wide team to investigate mold complaints in residential properties and to provide advice and assistance to residents on remediation strategies

TARGET

By FY2021, create a task force dedicated to providing support and assistance to the residents of Alexandria that are experiencing mold within their homes

SHORT-TERM ACTIONS

8.2.1 By FY2021, create a task force to investigate the best way to manage mold complaints by residents of the City.

Cost Estimate: $20,000/year

MID-TERM ACTIONS

8.2.2 By FY2025, expand the scope of the task force to address other indoor air pollutants of concern to City residents.

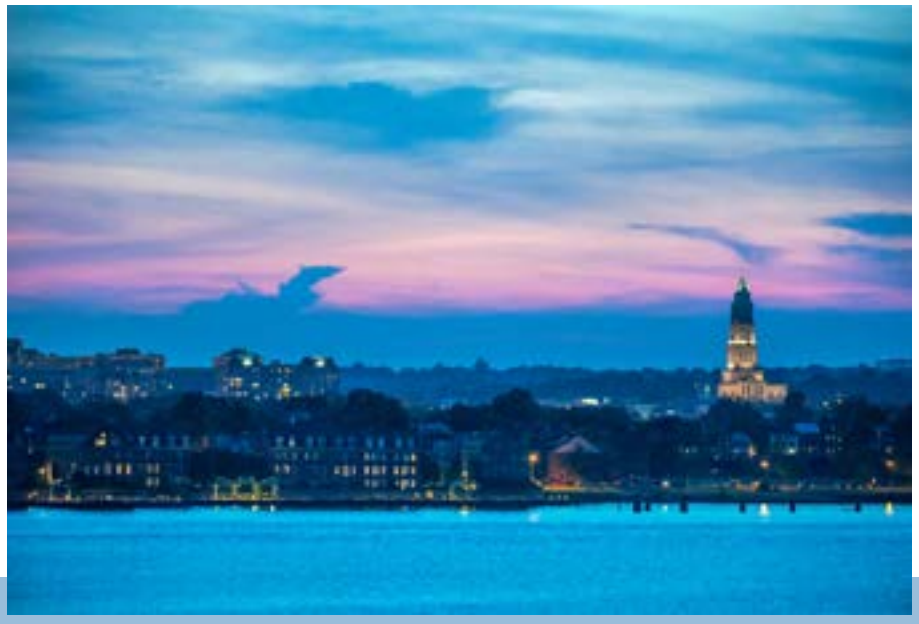
Cost Estimate: This will depend on the issues identified and potential actions required.

Justification

There are a significant number of mold complaints made each year by the residents of Alexandria. Currently the only resource available to assist residents is directing them to literature available through the Department of Housing and Urban Development. The City has no legislative powers to assist in facilitating repairs in rental properties, or any staff training in mold remediation.

Accountable Parties

All City Departments led by Environmental Health.

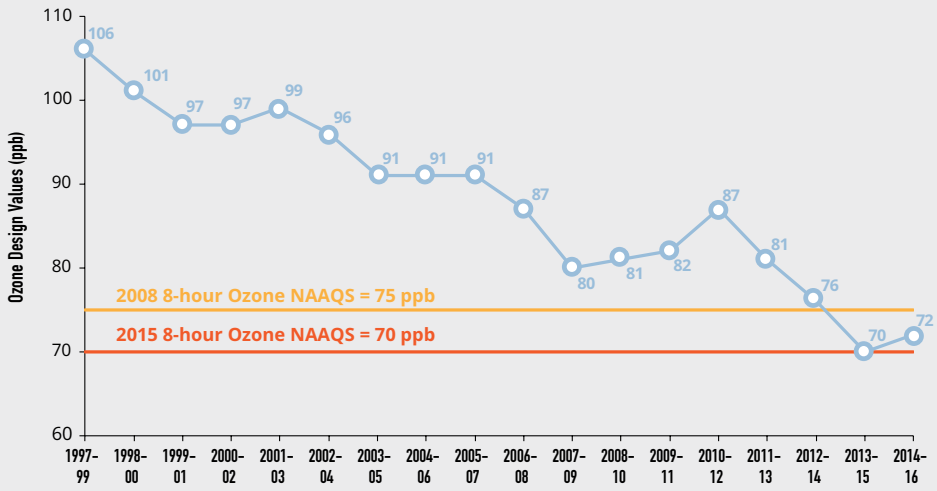


AIR QUALITY

Good air quality is fundamental to our well-being. On average, a person inhales about 500 cubic feet of air every day, and the presence of certain contaminants in this air can adversely affect people's health. People with pre-existing respiratory and heart conditions, diabetes, the young, and the elderly are particularly vulnerable. The Metropolitan Washington region has achieved significant air quality improvements over the last twenty years thanks to more stringent state and federal air pollution control programs as well as efforts by local governments such as Alexandria. MWCOG, in collaboration with member jurisdictions, has been instrumental in leading and coordinating a majority of efforts in air quality improvements. However, even with these improvements, the region, with few industrial point sources, is still not meeting the new 2015 ozone limits of the National Ambient Air Quality Standards (NAAQS). Transportation continues to be a major source of air pollution. As the City and the region make progress on transportation and mobility options, it will result in cleaner air and reduced GHG emissions.

To date, the City has achieved significant reduction in air pollutant emissions from the three major point sources in the City. This was achieved via the permanent closure of the Mirant coal-fired power plant in 2012, installation of state-of-the art air pollution control equipment at the Covanta waste-to-energy-plant in 2000, and issuance of a stringent operating permit limitations to the Virginia Paving Plant in 2006.

8-hour Ozone Design Values in the DC-MD-VA Nonattainment Area (1999-2016)



Future air quality improvement will directly result from the City's multi-faceted effort in tackling low-carbon transportation, energy efficiency improvements, increased use of renewable energy and green buildings as these sources reduce local fossil fuel use. Another focus will be on reduction of air pollution and the related emissions from transportation and smaller area sources such as construction sites, and lawn and garden equipment. The City will continue collaborating with MWCOG on regional air quality issues and education and outreach. Strategies and priorities will be developed to reduce non-point and area sources of air pollution and emissions within the City.

9 Air Quality

GOAL

Reduce air pollution from all types of sources and assist the Northern Virginia Region in complying with all National Ambient Air Quality Standards (NAAQS) for criteria pollutants

TARGET

By FY2023, achieve compliance with 2015 ozone NAAQS of 70 ppb and other pollutants for the Metropolitan Washington Council of Governments (MWCOG) region including Alexandria

SHORT-TERM ACTIONS

9.1.1 By FY2020, evaluate potential methods for reducing air pollution and incorporate them into the standard development conditions.

Cost Estimate: Using existing resources

9.1.2 By FY2020, enhance/expand the City's Air Quality Action Day and conduct outreach to residents, businesses and City staff.

Cost Estimate: Using existing resources

9.1.3 By FY2021, develop strategies to reduce air pollution from dispersed, non-point sources such as construction sites and powered lawn equipment.

Cost Estimate: Using existing resources

9.1.4 By FY2021, promote the use of battery-powered leaf blowers and lawn mowers and investigate incentive mechanisms.

Cost Estimate: Using existing resources

9.1.5 By FY2022, develop methods to quantify air pollution impacts and benefits of major transportation projects.

Cost Estimate: Using existing resources

MID-TERM ACTIONS

9.1.6 By FY2024, prepare a "State of the Air" report that includes recommendations for pursuing further air quality improvement opportunities.

Cost Estimate: $50,000-100,000 plus existing resources

Cost Breakdown: 100% Consultant's charge

LONG-TERM ACTIONS

9.1.7 By FY2029, complete all recommended measures identified in the "State of the Air" report.

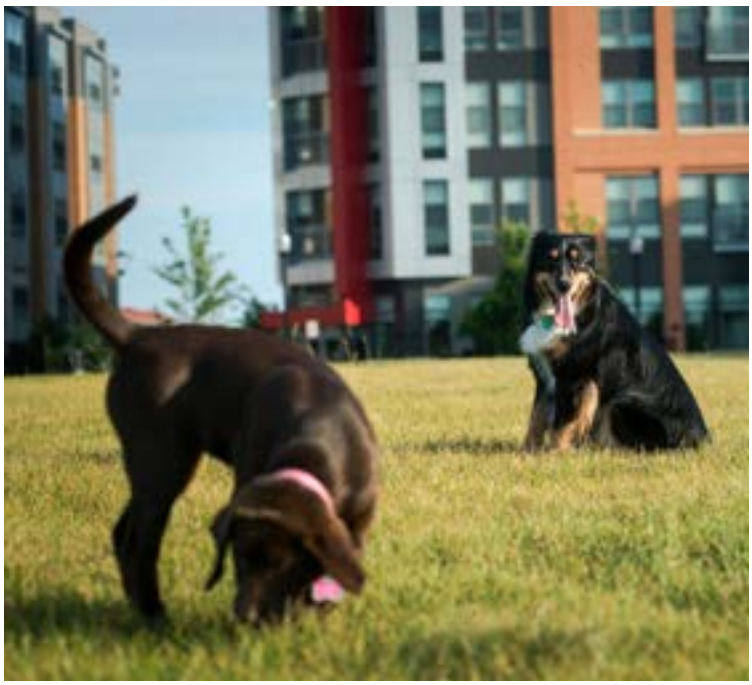
Cost Estimate: Will be based on identified measures.

Legislative Priorities

Continue to work closely with the Metropolitan Washington Council of Governments to advocate for more stringent federal and state regulations aimed at improving air quality in the Metropolitan Washington region.

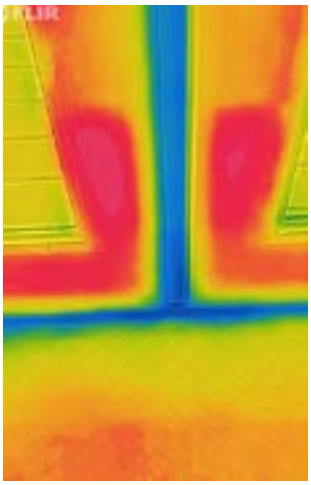
Justification

Ozone in the air can harm human health, especially on hot sunny days when ozone can reach unhealthy levels. Long-term exposure to ozone is linked to aggravation of asthma and is likely to be one of many causes of asthma development. Long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children.



IMPLEMENTATION, EDUCATION, AND OUTREACH

Implementation, Education, and Outreach



The City government, businesses, and individuals need to take responsibility, be informed, participate in decision making, and work together to achieve common goals and targets of sustainability for the benefit of Alexandrians now and for generations to come.

Getting the community to participate in environmental actions involves getting people excited with creative messaging, activities, and incentives. There is a continuous evolution of policies, programs, and resources that can facilitate community engagement in collaboration with regional partners. These programs include working with partners to leverage limited resources such as an Eco-City Academy program to graduate Eco-City Ambassadors. This program can put boots on the ground and spread sustainability similar to Energy Masters and Master Gardener programs.

The annual Earth Day festival is organized by an engaged community committee lead by an Environmental Policy Commissioner with support from staff in many departments of the City. This premier environmental education and outreach event in the City features a trash fashion show by students, activities and exhibits by City departments, displays by the water and wastewater utilities, tent talks on specific topics, and many other private exhibits for a full day of fun and learning. The City has also been successfully partnering with libraries in a loan program for thermal cameras and kill-a-watt meters to help residents and businesses see what energy losses are hidden behind the walls and how electronics and equipment draw electricity even when not in use.

The existing Eco-City Green Building Resource Center was created with DOE grant money and available on Eco-City web site in since 2012 with extensive resources and videos. Many of the still-applicable suggestions are provided as easy to use one-page handouts. Any out-of-date materials will be updated as part of the EAP action to engage and educate residents, businesses, and City staff.

The actions in the EAP will be coordinated across City departments and in collaboration with regional partners to provide opportunities for the education of the general public, contractors, and trade professionals. It involves providing more frequent education and outreach, online tools and videos, and leveraging support from professional organizations such as MWCOG, Virginia Building Code Officials Association and schools. Ultimately, the City's youth needs to be a priority in order to grow a culture of sustainability.

Additional metrics and monitoring will be added as part of the implementation of EAP 2040 actions. Verification of performance can be enhanced by using metrics and sharing them on a public dashboard. Green certifications, recognition, and award programs can help in advancing adoption and participation by residents and businesses.

10 Implementation, Education, and Outreach

10.1 EDUCATION AND OUTREACH

GOAL

Motivate the public to take actions that make Alexandria more sustainable

TARGET

By FY2023, establish ongoing educational opportunities to increase awareness of environmental challenges and provide recommendations for adoptable daily sustainable practices for residents, businesses, and City staff

SHORT-TERM ACTIONS

10.1.1 By FY2020, design and implement robust outreach campaigns to engage and educate residents, businesses, and City staff on how to adopt emission-reducing strategies, environmental efforts related to the EAP, and opportunities for involvement. Tactics may include outreach events, educational materials, social media and website content, live-streamed events, and hands-on learning experiences. Update the Green Building Resource Guide Resource Center for new small businesses and existing buildings. Additional outreach and education will be leveraged with Eco-City Ambassadors who go through an Eco-City Academy to assist in spreading sustainability throughout the community and participate in the City's commitment to reduce GHG emissions and address climate change.

Cost Estimate: $20,000/year

Cost Breakdown: New costs for info-graphics, handouts, sustainability giveaways, and to create a vibrant and current web presence with instructional videos, sustainable signage, and workshops. Staff time and effort is not included in this cost.

10.1.2 By FY2020, update Eco-City web-based information and coordinate with related sustainability information on other city web sites.

Cost Estimate: No direct cost, staff time only.

Implementation, Education, and Outreach

10.1.3 By FY2020, initiate a collaborative effort to update environmental education in the Alexandria City Public School curriculum, focusing on City-specific sustainability issues. This work may include creating resources to facilitate student education and outreach.

Cost Estimate: $30,000/year

Cost Breakdown: New costs for curriculum and materials design and printing.

10.1.4 By FY2021, select and launch a green business recognition or certification program in collaboration with the local business community and using a third-party rating system. Link local recognition opportunities via the City website to facilitate consumer selection based on sustainability.

Cost Estimate: $10,000/year

Cost Breakdown: New costs for program (if applicable), implementation, and promotional materials.

10.1.5 By FY2021, establish a voluntary program for residents, schools, and businesses to report their efforts in reducing their environmental impact and create an awards program to incentivize participation.

Cost Estimate: $30,000/year

Cost Breakdown: New costs for program development, promotional materials, and awards event.

Justification

Multifaceted outreach and education are vital to grow a sustainable culture with the youth of the City and for the adoption by the overall community. Coordination with the schools will facilitate the effectiveness of the messaging. Using Eco-City Ambassadors will leverage City staff resources and utilize engaged community resources within the City.

Accountable Parties

Transportation and Environmental Services

10.2 IMPLEMENTATION AND MONITORING

GOAL

Enhance EAP implementation by increasing monitoring, measuring, and reporting efforts by the City and the community

TARGET

Annual updating of EAP progress and sustainability metrics

SHORT-TERM ACTIONS

10.2.1 By FY2020, update measurement methods, monitored actions, and key indicators to capture and report new, changed, and trending sustainability goals, public building performance, regional efforts, and accomplishments in online dashboards.

Cost Estimate: Existing staff resources

10.2.2 By FY2020, participate in regional and state efforts to increase the sustainability and enforcement of construction practices, regulations, and codes (International and Virginia Energy Conservation Code, recycling, stormwater management, and others). Partner with regional municipalities and organizations to provide shared professional training to contractors, design professionals, and individuals in sustainable building and operating methods to achieve more sustainable infrastructure.

Cost Estimate: $10,000/year

Cost Breakdown: New costs for travel, and registration fees, certifications, and resource materials

MID-TERM ACTIONS

10.2.3 By FY2024, publish interim EAP Progress report of short-term actions.

Cost Estimate: $10,000

Cost Breakdown: New costs for graphic and web design.

Implementation, Education, and Outreach

Justification

Implementation and monitoring provides vital feedback to the community. Regional coordination and participation in development of state and national regulations and policies provides coordination and education of enforcement and monitoring methods for municipalities.

Accountable Parties

Transportation and Environmental Services-Office of Environmental Quality, General Services, Transportation, and Resource Recovery

APPENDICES

Acronyms and Abbreviations

Base Year	Reference year used to measure from
BTU	British thermal unit
CO2	Carbon dioxide gas
CO2e	Carbon dioxide equivalents based on global warming potential
CPACE	Commercial Property Assessed Clean Energy
DASH	Driving Alexandria Safely Home (DASH) is Alexandria's transit system
Dillon Rule	A legal principle that local governments have limited authority
EAP	Environmental Action Plan
Eco-City	Cities that enhance sustainability through planning and management
EPC	Environmental Policy Commission
FY	Fiscal year
GHG	Greenhouse gas
GreenVentory	A compendium of existing programs, policies, and processes that are sustainable
GWP	Global warming potential
ICLEI	International Council on Local Environmental Initiatives (now Local Governments for Sustainability)
IPCC	Intergovernmental Panel on Climate Change
KWh	Kilowatt hours
LED	Light emitting diode and a high-efficient light bulb
LEED	Leadership in Energy and Environmental Design
MS4	Municipal separate storm sewer system
MWCOG	Metropolitan Washington Council of Governments
MWh	Megawatt hours
Ozone	Colorless unstable toxic gas
PPB	Parts per billion
PPM	Parts per million
VMT	Vehicle miles traveled

Alexandria's Major Environmental Achievements since Adoption of the Environmental Action Plan 2030 (2009 – 2017)

In June 2009, the City adopted the comprehensive **Environmental Action Plan 2030** (EAP 2030) aimed at achieving the vision and principles set forth in the Eco-City Charter and leading the City further toward environmental sustainability. The following is a summary of major projects and initiatives that are either completed or ongoing since the EAP 2030 was adopted.

TRANSPORTATION & TRANSIT

The City's **Transportation Master Plan** approved in 2008, aims at an unprecedented paradigm shift, putting Alexandrians first, and providing them with innovative options for transportation.

Metroway Premium Bus Service on the Crystal City - Potomac Yard Transitway – With the introduction of the Washington Metropolitan Area Transit Authority's (WMATA) Metroway service in 2016, the Crystal City - Potomac Yard Transitway provides reliable service along the congested Route 1 corridor between the Braddock Road and Crystal City Metrorail Stations, with stops in Potomac Yard. Ridership on this service grew 44% from October 2015 through October 2016.

Expansion of the Alexandria Transit Company (ATC) DASH service and Fleet – DASH operates 12 routes and serves all of the Pentagon Metrorail station and the Alexandria Metrorail Stations during peak periods. DASH operates 54 energy efficient and environmentally friendly hybrid electric buses, representing 60% of its fleet. It is estimated that ATC's hybrid electric buses will reduce annual diesel fuel consumption by 60,000 gallons and carbon dioxide emissions by 1,300,000 lbs. ATC also took over operation of the King Street Trolley using five brand new 30-foot low-floor hybrid electric trolleys. Earlier this year, DASH celebrated its fifth anniversary of taking over daily operation of the King Street Trolley. Trolley ridership has grown steadily since 2012, and the single-month record for trolley ridership (115,000 boardings) was set in July 2017.

New Metrobus Route NH2 - Partnering with Fairfax County, State of Maryland, and Peterson Company, the City started a **Metrobus route** that operates between Alexandria and the new MGM Grand Casino in National Harbor, MD. The route will operate every 30 minutes from early in the morning until late at night and each stop in Alexandria will offer connections to local bus service (DASH, Metrobus), shuttles, Metrorail, Virginia Railway Express (VRE), and Amtrak.

Capital Bikeshare - The City launched its participation in the Capital Bikeshare Network with an initial installation of eight bikeshare stations in the Old Town area in 2012. There are now 31 Bikeshare stations throughout the City, with an additional 10 stations planned for installation in spring 2018. Bikeshare members reported using Bikeshare equally for work and non-work trips, thereby reducing the number of vehicle miles traveled (VMT) in automobiles. This program has been used by residents and visitors alike, with approximately 235,000 trips departing from Alexandria stations since the program began. The average number of rides increased 17 percent between 2015 and 2016 and 24 percent between 2016 and August 2017.

Traffic Lights LED Replacement Program – The City replaced all 2500 incandescent traffic lights with energy efficient LED lights. This reduces energy consumption by 650,000 kWh and $70,000 in electricity costs annually. As a pilot project using a US Department of Energy grant, City also installed 34 **LED street lights** in partnership with Dominion Virginia Power. Currently, new developments in the City are required to install LED street lights.

New Potomac Yard Metrorail Station is aimed at increasing transportation choices and attracting transit-oriented development. The resulting development around the station would support up to 26,000 new jobs within one-quarter mile, and 13,000 new residents within one-half mile, while removing thousands of private vehicles from the

congested Route 1 corridor. The Environmental Impact Statement (EIS) was completed in 2016 and WMATA is forecasted to award the project contract in the spring of 2018. The project provides a new direct access point to the regional transit system, maximizes potential transit ridership, and shifts automobile trips to other modes. It also provides accessibility to the regional transit system for the greatest number of area residents and employees and results in the following: 11,300 weekday station boardings by 2040; 6,700 daily automobile trips shifted to transit by 2040; 19 - 30% more residents within a half-mile walking; and 43 - 103% more employees within a quarter-mile.

Pedestrian and Bicycle Master Plan

The City's 2008 Transportation Master Plan encourages the use of alternative modes of transportation, reduces dependence on the automobile, and promotes a balance between travel efficiency and quality of life. The City updated the Pedestrian and Bicycle chapters of this plan to reflect changes that have occurred since 2008, including the Complete Streets policy, Capital Bikeshare program, and on-street bicycle facilities.

Complete Streets Policy and Program

Complete Streets are streets for everyone. They are a vital part of livable, attractive communities and are designed and operated to enable safe access for all users, including pedestrians, bicyclists, motorists and transit riders of all ages and abilities. City Council adopted a Complete Streets Policy in 2011 and was reenacted on May 17, 2014. In 2016, The City developed Alexandria Complete Streets Design Guidelines for the design of the City's public and private streets. The City has 26 miles of on-street bicycle lanes and 24 miles of sharrows. The City recently completed the highly-visible project on King Street, resulting in a reduction of annual crashes from seven to zero with no traffic diversion on sideroads. .

Safe Routes to School

Safe Routes to School (SRTS) is a federal program to improve the well-being of children by improving walking and bicycling conditions on the route to school and enabling and encouraging children to walk and bike. These efforts include new sidewalks, crossing improvements, speed limit reductions, bicycle parking and bicycle lanes; partnering with parents, schools and local non-profits, and evaluating of habits and effectiveness. In 2017, the City completed Safe Routes to School Walk Audits for the 13 Alexandria City Public Schools (ACPS) elementary schools during the 2016/2017 school year.

Multi-use Trail Maintenance and Usage

The City has 29 miles of bicycle and pedestrian paved and unpaved trails. From 2013 to 2017, the number of cyclist in the City has been increasing steadily. In 2015, the City installed data collection devices at strategic locations of a number of trails, including: Eisenhower Ave., Four Mile Run, Holmes Run, Mount Vernon and Potomac Yard Trails. The data collected shows an increase in trail usage of more than 82 percent from 2016 to 2017 alone. Improving commuting conditions for bicyclists and pedestrians represents a significant potential for shifting automobile trips to non-motorized modes that helps reduce air pollutants and greenhouse gas emissions.

WATER QUALITY

Chesapeake Bay TMDL (Total Maximum Daily Load) Action Plan - The City has been proactive in designing and implementing projects for the Chesapeake Bay TMDL to address total nitrogen (TN), total phosphorus (TP), and total suspended solids (TSS). The Virginia Department of Environmental Quality (VDEQ) requires a reduction by 2018 of 5% during the 2013-2018 permit cycle. The City's initial 2015 Bay TMDL Action Plan for 5% reductions actually outlined strategies to address approximately 44%, 39% and 39% of TN, TP and TSS reductions, respectively, by 2018, with the City achieving about 21% TP reduction to date. Projects in the Plan include retrofits to existing ponds such as Lake Cook and Ben Brenman Pond to enhance the treatment capacity and/or pollution reduction efficiency, while improving aquatic habitat and recreational benefits. The City continues to look for innovative solutions for addressing the Chesapeake Bay TMDL such as performing stream restorations, retrofitting City properties, and applying an integrated wet-weather approach.

Eisenhower Pond 19, a **regional stormwater management facility** identified as a strategy in the Bay TMDL Action Plan, was constructed on Eisenhower Avenue by a private developer on newly developed property. This regional pond drains over 67 acres and provides estimated pollutant reductions that exceed the state water quality requirements for development, and provides credits toward the Chesapeake Bay TMDL requirements.

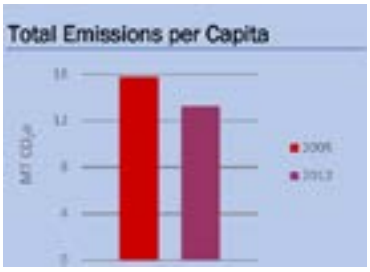
Stormwater Utility - The City has adopted a Stormwater Utility Fee to more equitably funding the City's stormwater management program to reduce the impact of stormwater pollution and flooding, perform infrastructure operations and maintenance, and ensure Alexandria is in compliance with state and federal stormwater regulations.

Combined Sewer System (CSS) Long Term Control Plan - The City submitted the CSS Long Term Control Plan Update to the VDEQ for approval on December 2, 2016. As part of the 2017 Virginia Legislative Session, legislation was passed and signed by the Governor that requires the City to revise this Long Term Control Plan Update to meet the 2017 legislation. The legislation requires that 1) the City to remediate all of its combined sewer outfalls, 2) construction of future combined sewer infrastructure projects begin no later than July 1, 2023; and 3) construction of these projects be completed by July 1, 2025. The City is currently revising its plan and will be providing updates on the development of the plan.

AIR QUALITY & GREENHOUSE GAS INVENTORY

City Eliminated the Largest Air Pollutant Source in the City and Northern Virginia – After a lengthy technical and legal challenge in front of the State Air Pollution Control Board, the City of Alexandria successfully reached an agreement with GenOn Inc. to permanently close its outdated coal-fired power plant located on the shore of the Potomac River in 2012. At the peak of its production, this plant emitted 15,000 tons of sulfur dioxide, 6,000 tons of nitrogen oxides and 600 tons of PM_{10} annually. Its closure also eliminated a major source of up to 4.5 million metric ton of annual carbon dioxide emissions, the equivalent of emissions of 600,000 cars. Substituting the electricity generation capacity of this power plant with one using cleaner fuel such as natural gas would result in an annual reduction of more than 2 million metric ton of carbon dioxide which is more than the total amount of carbon dioxide emitted annually by the whole city of Alexandria.

Greenhouse Gas (GHG) Inventory Conducted for 2005 and 2012 – City conducted GHG inventories for 2005 and 2012. The results showed total GHG emissions from the whole city decreased by 5% between 2005 and 2012 while the population increased by ~6% for the same period. Furthermore, the per capita GHG emissions reduced by 16%.



GREEN BUILDING

Private Development and Green Building - Since adoption of the City's Green Building Policy in 2009, approximately 25 million square feet of private development has been approved. Of this amount, more than 95% of the square footage complies with the City's Green Building Policy of LEED Certified (or equivalent) for residential buildings and LEED Silver (or equivalent) for commercial buildings.

City Government Buildings Built to LEED Ratings - The City adopted a policy of building all government buildings to at least LEED Silver certification. **LEED Gold Buildings** - T.C. Williams High School, Charles Houston Recreation Center, DASH Administration Facility, Alexandria Police Department Headquarter, James K. Polk Elementary School, Jefferson Houston Elementary School; **LEED Silver** – 2525 Mt. Vernon Avenue, Fire Station 209, Fire Station 210.

Green Roofs in City Government Buildings - Duncan Library, Cora Kelly School, City Hall, Alexandria Health Department, T.C. Williams High School, James K. Polk Elementary School

The City also developed an **Online Green Building Resource Center** and provided 10 free workshops for residents and business interested in learning about various green topics as part of the EECBG grant program.

AlexRenew's Multi-purpose Athletic Field on the Roof of the New Nutrient Management Facility – This innovative project creates a multi-purpose athletic field with artificial turf on the roof of an 18-million gallon nutrient management facility. As a partnership between AlexRenew, the City and the site developer, the field supports Eco-City Alexandria's goal of increasing open space in the City.

LAND USES

The City completed multiple land use plans including the Landmark Van Dorn Corridor Plan, Waterfront Plan, and the Beauregard, Eisenhower West, North Potomac Yard and Old Town North Small Area Plans, several of which are award winning. Each of these Plans includes a sustainability section, establishing standards and guidelines for sustainable practices, in addition to the Green Building Policy, as part of redevelopment that are of importance to the City and its residents and that advance the City's Eco-City sustainability goals. For the first time, the City requires LEED-ND Silver certification for the North Potomac Yard Small Area Plan (SAP) and the former power plant area within the Old Town North SAP.

OPEN SPACE AND ECOLOGY RESTORATION

The City adopted an **Open Space Plan** in 2003 addressing the City's short and longer-term open space needs. In 2013, the City achieved its 100-acre goal for acquiring, dedicating or placing land in conservation easements in order to maintain a 7.3 acre per 1,000-person ratio. A 2016 update to the Open Space Plan determined that if every open space specified in all active small area plans comes to fruition, the City can maintain this ratio until 2040.

In 2017, the **Northern Virginia Conservation Trust** acquired, through a fee simple donation, a 1.97-acre wetland where Cameron Run and Little Hunting Creek meet before flowing into the Potomac. It is a highly developed area, and sandwiched between major freeways and the Hunting Terrace residential building currently under construction. The site is listed as an eBird "Hotspot," with more than 100 different bird species observed in the immediate vicinity. The site also includes the two only known, still surviving Pumpkin Ash trees remaining in the City. Currently, the site is only accessible to the public by boat.

The **Four Mile Run Wetlands Restoration Project** restored an historic 2-acre tidal wetland along Four Mile Run. This wetland plays a prominent role in regional efforts to protect the Potomac River and the endangered Chesapeake Bay by restoring the diverse habitat and natural cycles that support life in and along these waterways. The wetlands restoration project integrates flood protection, environmental restoration, community aesthetics, community access and connectivity, recreation, and education.

Chambliss Stream Restoration and Crossing - The City completed a stream restoration project on Holmes Run near Chambliss Street that restored the banks and prevented tons of sediment from entering the stream system.

SOLID WASTE MANAGEMENT

City's Solid Waste Recycling Rate Increased Steadfastly toward the 2020 Target of 50% –Starting with a solid waste recycling rate below 30% when the Environmental Action Plan was adopted in 2009; the City reported its highest ever recycling rate of 49.3% to the Virginia DEQ for Calendar Year 2016, thanks to several waste collection initiatives.

Covanta Waste-to-Energy (WTE) Plant Significantly Contributes to City's GHG Emissions Reduction Effort - The City Council and Arlington County Board extended the Covanta Waste-to-Energy plant lease agreement through 2038 for the disposal of municipal trash. The Covanta waste-to-energy facility meets and exceeds all environmental requirements and co-produces 21 megawatts of energy that can power approximately 20,000 homes. This lease agreement results in estimated cost savings of $26 million through 2038 and yields a significant reduction in greenhouse gas emissions compared to landfilling. Based on Virginia specific data and assuming that the COVANTA WTE plant displaces landfills equipped with modern methane gas recovery systems, every ton of municipal solid waste diverted to COVANTA WTE plant reduces GHG emissions by approximately 0.7 ton of carbon dioxide equivalent (CO_2e). This equals a reduction in GHG emissions of ~220,000 tons a year. To put things in perspective, it would take the installation of a 10 kW solar photovoltaic system on each of about 34,000 homes in Alexandria to reduce the same amount of GHG emissions.

ENERGY MANAGEMENT & RENEWABLE ENERGY

A 42 kW solar photovoltaic system was installed at the Beatley Central Library. Smaller systems were also installed at the restroom building at Witter Recreational Fields (10kW) and Alexandria Renew's main pump station building. The City is Green Power Partner through the United States Environmental Protection Agency's Green Power Partnership program for offsetting 19% of the City's electricity use from renewable energy sourced through Renewable Energy Credits (RECs).

Solarize Alexandria, a program designed to make installation of solar power systems on Alexandria homes easy and more affordable, was launched in 2015 with campaigns following in 2016 and 2017. So far, fifteen residents installed solar power systems producing 70 KW through the program. The City's renewable energy capacity has increased from 97 kW to 480 kW since 2009.

The City received **Bronze designation** from the national SolSmart program for making it faster, easier, and more affordable for homes and businesses to go solar. SolSmart is led by The Solar Foundation and the International City/County Management Association (ICMA) and funded by the U.S. Department of Energy SunShot Initiative. As a SolSmart Bronze designee, the City is helping solar companies greatly reduce the cost of installations and pass those savings on to consumers. This allows even more local homes and businesses to obtain affordable, clean, and reliable electricity through solar. By making changes to local processes to reduce the time and money it takes to install a solar energy system, the City is helping and encouraging solar companies to do business in Alexandria, driving economic development and creating local jobs.

City Government Energy Management Program

- City carried out LED lighting retrofits at the Beatley Library and parking lot, Duncan Library, Burke Library, Barret Library, Chinquapin Recreation Center, Ramsay House, Black History Museum, Lyceum, Public Safety Center, Alexandria Health Department parking lot, Market Square parking garage, Courthouse parking garage, Union Street parking garage, Thompsons Alley parking garage, Cora Kelly Recreation Center exterior lighting, Alexandria Community and Detox Center, Ramsey Recreation Center, Chinquapin Recreation Center, and 2900 Business Center Drive.
- Re- and retro-commissioning projects to enhance the energy performance at Barrett Library, Beatley Library, Burke Library, Courthouse, Duncan Library, and Fire Station 204.
- High-efficiency boiler upgrades as replacements for older boiler technologies at City facilities, including Lee Center, Beatley Library, Courthouse, Barrett Library, Chinquapin Recreation Center, and Fire Station 201.

- High-efficiency HVAC system upgrades at City facilities, including Public Safety Center, Courthouse, Lee Center, Beatley Library, Chinquapin Recreation Center, Fire Station 204.
- Building Management System upgrades and controls optimization at Lee Center, Beatley Library, Public Safety Center, Barrett Library, Alexandria Health Department, and DASH Transportation Center. The City operates **31 hybrid-electric and 1 electric vehicles** in the City's vehicular fleet, including the operation of a shared pool fleet for employees to share in order to minimize the number of vehicles the City owns and operates.

The Alexandria City Public Schools (ACPS) completed renewable energy and green projects at several schools including:
- Minnie Howard's renewable energy HVAC system results in a 39% drop in energy costs.
- James K. Polk operates with 5 forms of renewable on-site energy including the first ground to air heat exchange commercial system in North America.
- The City collaborated with ACPS to complete a green roof and monitoring camera at Cora Kelly School to reduce energy consumption and stormwater generation, improve water quality, and to serve as an educational tool.

AlexRenew reduces annual energy consumption by 17% from a 2008 baseline. In 2016, AlexRenew reduced its total energy consumption per million gallons of flow by 13%, while reducing greenhouse gas emissions by 6% from its 2011 baseline. In the process of cleaning dirty water, AlexRenew also produces methane gas that is used to heat its buildings and fuel its boilers. AlexRenew generates more than 150 million cubic feet of renewable methane gas — enough energy to power 1,800 Virginia homes for one year. AlexRenew offset purchased energy by 32% using gas produced in its digesters.

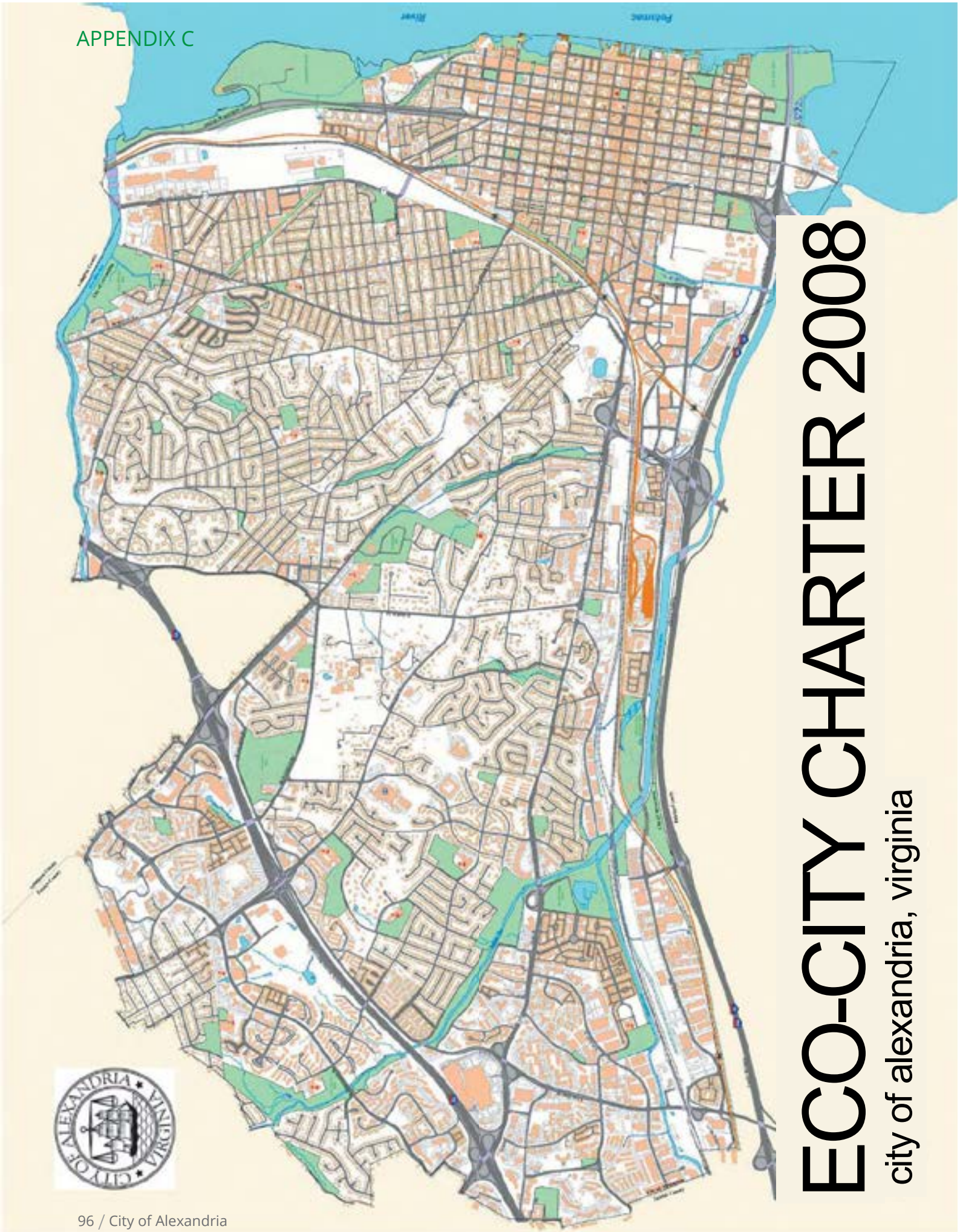
AFFORDABLE HOUSING AND ENERGY EFFICIENCY

Since 2009, all new affordable multi-family residential communities in the City of Alexandria have met **EarthCraft design and construction certification program,** the accepted green standard for assisted housing financed through the Virginia Housing Development Authority (VHDA). Completed affordable communities include the **Station at Potomac Yard** (64 units) and Jackson Crossing (78 units) and communities under construction include **AHC's St. James Apartments** (93 units) and AHDC's **Gateway Apartments** (74 units). In addition, **CLI and Wesley Housing** have completed substantial renovation of their affordable multifamily properties in the City including installation of energy efficient appliances, window replacement and upgraded heating and cooling equipment. **Brent Place**, a 207-unit high rise affordable rental property, was selected to participate in an energy and water conservation demonstration program under the Department of Energy's (DOE) Weatherization Innovation Pilot Program. To facilitate Brent Place's participation in the DOE program, the City subordinated its loan for a period of 10 years to allow the property to take advantage of federal dollars available to fund improvements recommended by the audit.

The City expanded the Arlingtonians for a Clean Environment (ACE) **Energy Masters' Program** into Alexandria in 2015. This program trains volunteers to work with residents of affordable rental housing to complete basic energy efficiency improvements and train households on energy conservation techniques. Energy Masters volunteers have worked with renters in more than 110 units in the City to make apartments serving low and moderate income households more water and energy efficient. This program has resulted in reduced utility bills for low-income renters As well as increased outreach in the community and schools.

Since 2009, 30 affordable homeownership opportunities have been created through the City's **Neighborhood Stabilization Program (NSP**) in partnership with Rebuilding Together Alexandria. The City received a grant from the Virginia Department of Housing and Community Development (DHCD) to acquire, rehabilitate and re-sell distressed properties in three target areas in the City. Through this effort, Rebuilding Together conducts a pre- and post-rehabilitation energy audit of each unit and completes a range of energy and water efficiency improvements to help lower energy costs for lower-income first-time homebuyers.

The City's **Home Rehabilitation Loan Program (HRLP),** primarily funded through the federal Community Development Block Grant (CDBG), assists approximately 10 low income Alexandria homeowners each year to address code violations, energy efficiency improvements, and accessibility needs. This program provides no-interest, deferred payment loans to income eligible households. Common improvements include replacement and installation of energy efficient heating and cooling systems, insulation upgrades, installation of Energy Star certified appliances and water conserving toilets and faucets. While the focus of the program is not limited to energy efficiency, funded improvements have assisted lower income homeowners in lowering their monthly utility costs and have served to reduce the City's carbon footprint. The City also supports home repair initiatives administered by Rebuilding Together Alexandria through annual funding for both their year-round volunteer-based home repair program as well as for their April Rebuilding Day.



ECO-CITY CHARTER 2008

city of alexandria, virginia

COMPILED BY:

Environmental Policy Commission
City of Alexandria

The Urban Affairs and Planning Program
Virginia Polytechnic & State University
Alexandria Center

SUBMITTED TO:

Alexandria City Council
Mayor, William D. Euille
Vice Mayor, Redella S. “Del” Pepper
Councilman Ludwig P. Gaines
Councilman Rob Krupicka
Councilmember Timothy B. Lovain
Councilman Paul C. Smedberg
Councilman Justin M. Wilson

ADOPTED:

June 14, 2008

Cover | City of Alexandria, GIS Base Map

ECO-CITY ALEXANDRIA

Eco-City Charter

City of Alexandria, Virginia

Vision
Definition of Sustainability
Guiding Principles
Roles & Responsibilities
Pledge & Commitment

JUNE 14, 2008

vision

On September 14, 2004, the City Council of Alexandria, Virginia adopted the 2004-2015 Strategic Plan* that sets forth the following vision:

Alexandria is a Vibrant, Diverse, Historic, and Beautiful City with Unique Neighborhoods and Multiple Urban Villages where we take Pride in Our Great Community.

Using the 201 5 Strategic Plan as our guide, we offer the following Eco-City Vision in which Alexandria's citizens, businesses, and City government participate in a vibrant community that is always mindful of the needs and lifestyles of the generations to come.

We see Alexandria as a city where social well-being is supported by a strong economy and sustained by a healthy environment. Specifically, we envision Alexandria as a city that:

Builds Wisely

Where our built environment preserves and maximizes open spaces, natural landscapes, historic resources, and recreational opportunities, while protecting and improving our natural environment and public health.

Embraces Natural Beauty

Where we create beautiful parks, gardens, streetscapes, trails, and open spaces that embrace Alexandria's natural beauty, preserve our biodiversity, increase our tree canopy and streamside vegetation, and encourage a healthy, active lifestyle for all of our residents.

Improves Water Quality

Where we celebrate our heritage as a great port city by improving the Potomac River waterfront, eliminating combined sewer overflows, reducing storm water runoff, and improving the quality of our streams so that they are once again fishable and swimmable.

Clears the Air

Where we reduce significantly air pollution from all sources including vehicles, industrial sources, and power plants.

* See http://www.alexandriava.gov/uploadedFiles/council/info/strategicplan.pdf

Moves Smartly

Where we travel less and less by car and increasingly by mass transit, walking, and bicycling.

Conserves Energy and Resources

Where we reduce our energy and water use and minimize our environmental footprint.

Minimizes Waste

Where we reuse and recycle materials and significantly reduce our volume of solid waste and toxic chemical releases.

Supports Healthy Living

Where we create environmental policy and programs not only for a healthier planet but also for a healthier and safer citizenry.

Readies for Change

Where we foresee and mitigate the impacts of environmental threats such as climate change.

Leads Intelligently & Holistically

Where we implement change harmoniously and synergistically across interdependent areas.

Shares Responsibility

Where individuals take responsibility, decision-making is shared, and the community works together to achieve common goals that reflect the interests of a growing, diverse, and well-informed population.

definition of sustainability

Sustainability means meeting our community's present needs while preserving our historic character and ensuring the ability of future generations to meet their own needs. It involves balancing and integrating environmental, economic, health and social issues so as to maximize the quality of life for all of Alexandria's residents. Sustainability also requires us to consider the impacts of our decisions and actions beyond the City of Alexandria and seek the continuous evolution of policies and programs.

guiding principles

The following guiding principles are rooted in the definition of sustainability and reflect the goals established in Alexandria's 201 5 Strategic Plan. This interdependent network of guiding principles and policies is consistent with a systematic and integrated approach to sustainability.

LAND USE & OPEN SPACE

The City's land use and open space policies must harmonize its built and natural environments to ensure that growth does not jeopardize environmental sustainability and preserves Alexandria's character. The City's land use policies will accommodate increases in people and jobs through green development that:

- Ensures that land use is designed to encourage walking, biking, and public transportation through mixed-use zoning, interconnected pathways, and targeted density increases around public transportation hubs.
- Creates greater opportunities for sustainable compact development and redevelopment that requires the use of green building practices and prioritizes provision of usable open space and recreational areas.
- Ensures that City building codes, zoning ordinances, and other land use regulations reflect the goals of this Charter, so that sustainability requirements are consistently applied to all preservation, redevelopment, and development across Alexandria in ways appropriate to the character of the particular neighborhood.
- Ensures that development protects and enhances natural resource capacity.
- Protects, enhances, and increases Alexandria's open space and green infrastructure including wildlife habitat, parks, trails, tree canopy, and watersheds.
- Ensures that land use decisions do not foster or perpetuate social injustice.

WATER RESOURCES

Alexandria's past, present, and future are indelibly linked to the Potomac River and the quality of life the river sustains. Water quality in Alexandria will be managed in a sustainable manner consistent with good stewardship of the local streams, the Potomac River and the Chesapeake Bay for the public health, ecological and recreational benefits of current and future generations. The City will:

- Promote public health by continuing to ensure safe and reliable drinking water.
- Use environmentally responsible flood management, stormwater control, and wastewater treatment to protect the public's health and property.
- Promote - through sustainable practices - safe, swimmable, and fishable waterways for its citizens and visitors, and enhance the ecological integrity of its downstream waters, by minimizing stormwater runoff and pollutants draining to the Potomac River and Chesapeake Bay.

- Advocate water conservation and reuse in order to preserve the quantity, not just the quality, of our water resources.

AIR QUALITY

Alexandria faces significant challenges in improving air quality including those presented by emissions from vehicles, older industrial facilities, and the regional transport of air pollution. Given that one in eight residents have respiratory illnesses, the City should influence and control emissions sources in a manner that reflects the choices and wishes of the community. The City and its citizens will:

- Enhance their ability to manage outdoor air quality from damaging pollutants in its jurisdiction and will consider emerging threats when establishing outdoor air quality goals and regulatory approaches.
- Be proactive in protecting public health and ecological quality by lowering the amount and number of sources of air, light, and noise pollution.
- Educate those who manage commercial and public buildings on methods for improving indoor air quality and educate citizens on the harms associated with poor indoor air quality.

TRANSPORTATION

The City of Alexandria will encourage modes of transportation that reduce dependence upon the private automobile by promoting mass transit and pedestrian- and bike-friendly transportation networks. The City will integrate transportation options with land use decisions in order to ensure a healthy environment while continuing economic growth. The City will:

- Provide all its citizens - regardless of age, income, race or ability - with safe, accessible, efficient, and affordable transportation options.
- Prioritize walking, biking, and public transit in order to discourage single-occupancy vehicles.
- Reduce the environmental footprint of travel by introducing, designing and encouraging sustainable methods of transport and infrastructure.

ENERGY

The quantity and sources of energy used by Alexandria's government, businesses and residents impact our environment and quality of life—whether it be through pollutants added to the air, negative effects on water quality or local contributions to climate change. Recognizing this, Alexandria commits to managing its energy—both the electricity that powers our buildings and homes and the fuel that powers our vehicles and other equipment—based upon the following principles:

- Reduce energy consumption through conservation.
- Produce energy locally and sustainably, through installation and promotion of the use of renewable and efficient energy technologies.
- Convert existing uses of fossil-fuel energy to renewable energy. We envision and work toward a day when Alexandria relies solely on renewable energy sources.

BUILDING GREEN

Alexandria's government, businesses, and citizens impact our environment through the choices they make when renovating existing structures and constructing new ones. These choices manifest themselves in the quantity and types of energy we use, the impact we have on our water quality, the amount of waste we create, the amount and quality of green space available to us, and our public health. Therefore, the City's building practices will:

- Adopt and maintain initiatives that require best in practice measures to reduce overall environmental impact of renovation, redevelopment, and new development.
- Integrate green building and sustainability standards into all private and public development, including historic preservation, renovation, and new construction.
- Encourage the preservation and adaptive reuse of existing buildings, and promote the reuse and recycling of building materials in all development.

SOLID WASTE

Recognizing that managing waste is a public health issue as well as a quality of life issue, Alexandria will maintain its well-preserved public image by managing, handling, and disposing of solid waste in an environmentally sustainable manner. Alexandria will manage waste as a hierarchy of uses with the following priorities:

- Priority One: Reduce
- Priority Two: Reuse
- Priority Three: Recycle
- Priority Four: Resource recovery (e.g., convert to energy, composting, etc.)
- Priority Five: Proper disposal

ENVIRONMENT & HEALTH

Sustainability is not just about the health of the earth; it is also about human health. Indoor and outdoor air quality, water quality, land use planning, toxic chemical exposure, noise and light pollution, and the safety and habitability of buildings directly impact human health and the natural environment. Alexandria will:

- Promote and support policies and individual decisions that reduce exposure to toxins and pollutants, minimize environmental impact, and encourage a healthy lifestyle.
- Increase equitable access to safe, healthy, and organic food, in particular for children and adolescents, and encourage local and regional food production.

EMERGING THREATS

Alexandria must be adaptive and responsive to emerging and unforeseen environmental threats – such as climate change – that could strain infrastructure, deplete natural resources, disrupt the economy, and threaten public health. Failure to respond quickly and appropriately to such threats will likely have severe consequences for the health and economy of Alexandria and its citizens. To better prepare for and avert environmental crises, Alexandria will:

- Make policy, infrastructure, and land use decisions that prepare for flooding, drought, disease, and other impacts to humans and wildlife from environmental threats such as climate change.
- Conserve energy and achieve carbon-neutrality.

- Identify ways to reduce/eliminate nutrient loading to waterways.
- Conduct accurate and continual assessments of resource and infrastructure capacity when planning to ensure growth and development does not exceed capacity.
- Ensure that Alexandria understands these threats, its role in the problem, and its part in the solution.

IMPLEMENTATION

Improving environmental quality, conservation and the public welfare requires a harmonized approach to implementation, as well as collaboration both within and around Alexandria. The primary responsibility of environmental steward-ship shall be equally shared by all Alexandrians. In order to achieve the Eco-City Vision and the Guiding Principles set forth in this Charter, the City will:

- Educate and engage its citizens, visitors, local businesses, schools, and civic organizations on the City's concept of sustainability, the importance of identifying goals for environmental quality, and the vision and principles of this Charter.
- Develop and encourage more public-private-civic partnerships within Alexandria and beyond, and work with federal, state, and neighboring governments to implement these principles and achieve sustainability.
- Conserve resources, make sustainable purchasing choices, and make the long- and short-term investments necessary to achieve the principles of this Charter.
- Ensure city policies give incentives for achieving the vision and principles of this Charter and disincen-tives for behaviors that impede sustainability.
- Become a leader, educator, advocate, facilitator, integrator, and innovator in sustainability.

roles & responsibilities

The Eco-City Charter serves as a guide for moving the city towards a sustainable future. Fulfilling this Charter requires coordinated participation and commitment by the EPC, City government, and the community. The Charter's success depends on each of these parties taking an active and innovative role as stewards and guardians of this Charter's principles and vision.

ENVIRONMENTAL POLICY COMMISSION

- Develop an Environmental Action Plan that adheres to the principles outlined in this Charter and ad-vances the City towards the vision of a sustainable city; review and revise the Action Plan as needed, but no less than once every five years.

ADOPTED JUNE 14, 2008

- Inform and educate the community on the vision, principles, and policies outlined in the Charter and the Environmental Action Plan.
- Identify specific steps that citizens and businesses can take to help Alexandria achieve the principles and vision set forth in this Charter.
- Work with and support City Departments, Boards, and Commissions to promote and ensure that the principles within the Charter are considered in key decisions and infused in City programs and policies.
- Produce an annual report card that evaluates the progress of the City toward meeting the sustainable vision set forth in the Charter and Environmental Action Plan.
- Review the Charter no less than every ten years and amend as necessary to ensure that it continues to meet emerging sustainability issues and the needs of the City and its residents.

CITY COUNCIL, CITY MANAGER, CITY DEPARTMENTS, BOARDS & COMMISSIONS

- Lead by example: identify and implement specific projects for the City government to become more sustainable and create incentives for Alexandria citizens to do the same.
- Maintain our best environmental practices while investing in new ideas to achieve the vision and principles of this Charter.
- Incorporate sustainability practices, and encourage interdepartmental coordination to ensure all City decisions are compatible with the principles of the Charter.
- Work with the Environmental Policy Commission to advance the principles in the Charter and the steps set forth in the Environmental Action Plan.
- Work to make sustainability the natural, easy, and preferred choice for decisions by the City as well as its citizens and businesses.
- Develop and implement an outreach program to educate the community on the vision and principles in the Charter, with particular attention on ensuring that the City's youth are given a foundation of knowledge in the principles of environmental stewardship.
- Identify and develop key regional partnerships to address the sustainability challenges of the region.

CITIZENS & COMMUNITY

- Take responsibility for the social, environmental, economic, and health impacts of our decisions and be accountable for our actions.
- Encourage children, businesses, neighbors and community organizations to practice and demand sustainability.
- Engage in and contribute to the City's sustainability planning processes and bring forth ideas to ensure the Charter and the Environmental Action Plan are current and meet the needs of the community.
- Hold local, regional, state, and national leaders accountable for achieving sustainability.

This charter is the result of a collaborative effort between the City of Alexandria, its Environmental Policy Commission, and Virginia Tech's Urban Affairs & Planning Program in Alexandria.

Design by Kimberley Hodgson

Metropolitan Washington Council of Governments

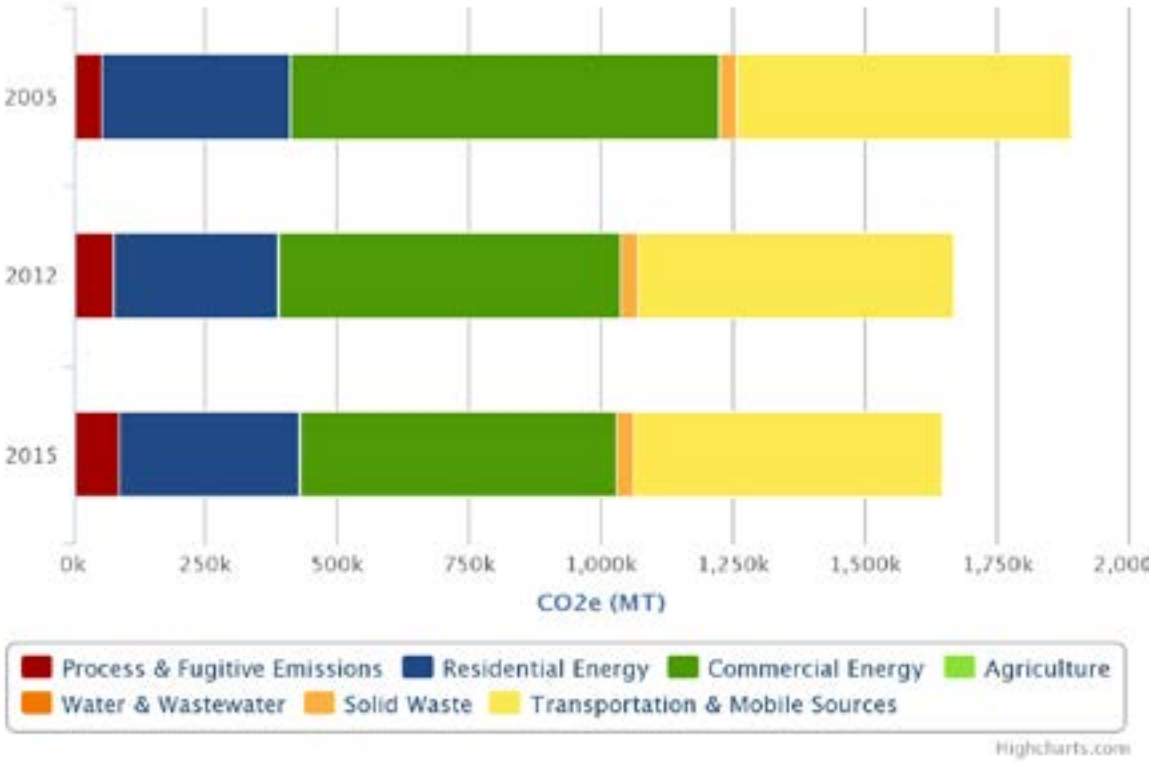
City of Alexandria, Virginia

Community-Wide Greenhouse Gas Inventory Summary Factsheet

Emissions Summary

City of Alexandria community-wide greenhouse gas (GHG) emissions decreased by 13% between 2005 and 2015.

- Despite an 12% growth in population, GHG emissions reduced from 1.89 $MMTCO_2e$ (million metric tons of carbon dioxide equivalent) in 2005 to 1.64 $MMTCO_2e$ in 2015.
- Per capita emissions decreased 22% between 2005 and 2015; from 14.1 $MTCO_2e$ (metric tons of carbon dioxide equivalent) in 2005 to 11.0 $MTCO_2e$ in 2015.
- In 2015, energy consumption (residential and commercial) accounted for 57% and transportation and mobile sources accounted for 36% of GHG emissions. Efficiency and switching to cleaner fuel sources contribute to GHG reductions.



Inventory Background

In 2008, the Metropolitan Washington Council of Governments (COG) and local governments across metropolitan Washington collaboratively established the regional GHG emission reduction goals of: 10% below business as usual projections by 2012 (back down to 2005 levels); 20% below 2005 levels by 2020; and 80% below 2005 levels by 2050. COG and its member jurisdictions are working toward these goals. City of Alexandria surpassed the 2012 goal, demonstrating that GHG reductions are possible even as the population and economy grows.

Emissions Activities

These inventories measured GHG-emitting activities undertaken by residents, businesses, industry, and government located in the City of Alexandria, as well as emissions from visitors. Emissions sources accounted for include:

- Electricity consumption from all sectors within the county;
- Combustion of natural gas and other fuels;
- Mobile transportation, including on-road vehicular travel, air travel, and commuter rail travel undertaken by residents, business, and visitors in the county, and off -road activities such as use of construction and landscaping equipment;
- Collection and treatment of solid waste produced by residents and activities within county boundaries;
- Pumping and treatment of water and wastewater used or produced by residents and activities; and
- Agricultural emissions from enteric fermentation, manure management, and soils (including fertilizer application);
- Fugitive emissions from ozone depleting chemicals and natural gas.
- All emissions are reported in million metric tons of carbon dioxide equivalent ($MMTCO_2e$) or metric tons of carbon dioxide equivalent (MTCO2e).

Methodology

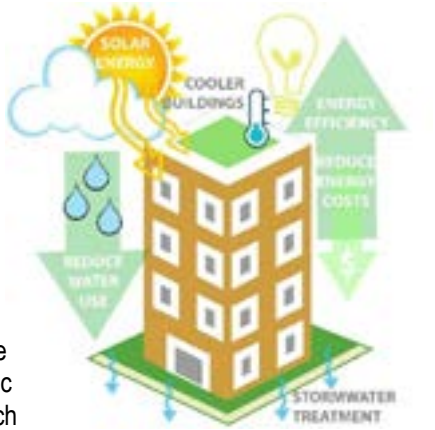
- The methodology for the City of Alexandria GHG inventory is consistent with the metropolitan Washington regional GHG inventory. Both the regional and jurisdictional inventories use the ICLEI US Community Protocol and ClearPath tool to measure emissions.
- Utility data was collected from regional electric and natural gas utilities. Emissions factors for electricity were based on EPA's Emissions & Generation Resource Integrated Database (eGRID) versions for 2005, 2012, and 2014.
- On-road and off-road transportation emissions were calculated using the EPA's Motor Vehicle Emission Simulator (MOVES v2010a and 2014) and based on VMT data provided by COG's Transportation Planning Board. Air travel emissions were calculated using national emissions from the EPA GHG Inventory scaled locally using population and air travel data from the Washington-Baltimore Regional Air Passenger Survey. Commuter rail emissions were calculated using MARC and VRE diesel consumption data scaled to the region.
- Emissions from landfills were calculated based on local and regional solid waste data. Wastewater treatment emissions were determined by data collected from local water utilities.
- Agricultural emissions were calculated using EPA's State GHG Inventory Tool and data from EPA's Chesapeake Assessment Scenario Tool and USDA's Census of Agriculture.
- Ozone depleting chemicals were calculated using national emissions scaled locally by population.

Links

- Metropolitan Washington Climate Energy and Environment Policy Committee Webpage: https://www.mwcog.org/committees/climate-energy-and-environment-policy-committee/
- Eco-City Alexandria: https://www.alexandriava.gov/Eco-City

CITY OF ALEXANDRIA

2019 Green Building Policy



POLICY STATEMENT:

Green building is a practice that brings environmental and economic benefits to present and future generations. A green building ensures that sustainable standards are adhered to throughout the design and construction processes to lessen the impacts of the building on the local and global environment, resulting in lower operational costs and a healthy indoor environment for building occupants. The standards of the 2019 City of Alexandria Green Building Policy provided herein establish minimum green building practices for new private development and furthers the City's commitment to lead by example through new development and renovation of its own public buildings. In addition to instituting standards to achieve an overall improvement in building performance, this Green Building Policy includes a cutting-edge, directed-use approach that targets the reduction of energy use and mitigating greenhouse gas emissions, increased water efficiency and improved indoor environmental quality in both new private and public buildings. As a result, implementation of this Green Building Policy will contribute to reduced greenhouse gas emissions, conservation of potable water and improved human health in the City of Alexandria.

DEVELOPMENT STANDARDS:

New private development, new public development (City-owned buildings, including Alexandria City Public Schools) and major renovations that require a Development Site Plan (DSP) or a Development Special Use Permit (DSUP) are subject to comply with the Green Building Policy. The Green Building Policy is in effect as of March 2, 2020 for DSP and DSUP applications submitted on or after this date.

The 2019 Green Building Policy identifies: 1) the pathways to achieve the City's green building performance standards, including certification through three nationally recognized green building rating systems, 2) a minimum level of green building certification for both private and public developments, and 3) priority "Performance Points" within each rating system that a project is expected to achieve.

RATING SYSTEMS & MINIMUM LEVEL OF CERTIFICATION:

LEED, Green Globes, and EarthCraft are the standard third-party green building rating systems accepted under the Green Building Policy. The minimum level of certification for each rating system is provided on the following pages for both public and private development. The latest version of each rating system at the time of the first Final Site Plan submission shall apply.

In addition to the LEED, Green Globes or EarthCraft green building rating systems, projects may choose an alternative path for certification through an independent, third-party certifier. The independent, third-party certifier must verify that the performance standards of the Green Building Policy are met.

PERFORMANCE POINTS:

Performance Points are defined as specific minimum credit points each project must achieve within the minimum level of certification for the selected green building rating system. Performance Points are identified within the areas of energy use reduction and greenhouse gas emission reductions, water efficiency, and indoor environmental quality. Projects that use LEED should refer to the LEED Credit Library for the specific criteria of each point. Those who utilize Green Globes or EarthCraft must comply with the Performance Point overlay criteria in Appendix A and Appendix B of this Policy, respectively. To maintain alignment with the intent of this Policy, Performance Points may be adjusted over time to correspond with updates to the rating systems, revisions to the building code, and/or updates to state, federal, or other City policies.

In addition to the minimum level of certification and the designated Performance Points, public development will meet the following criteria:

STORMWATER	100% of the required stormwater treatment through green infrastructure.
NET ZERO ENERGY	An energy-efficient building where, on a source energy basis, the actual annual delivered energy is less than or equal to the on-site renewable exported energy.

PUBLIC BUILDING RENOVATIONS:

For renovations of City-owned buildings that do not require a DSP or DSUP, the City will apply LEED Interior Design and Construction (ID+C) and LEED Operations and Maintenance (O&M) rating systems as a guideline for interior design and construction projects and targeted renovations of individual building systems (e.g.; HVAC, roof, windows, plumbing, etc.). Actual third-party certification may be used when technically and financially feasible.

FLEXIBILITY:

Flexibility from the Green Building Policy will be considered on a case-by-case basis. If flexibility is requested, the Director of Planning and Zoning will consider the project size, proposed use and the alternate green building practices the applicant proposes to incorporate into the project to determine if the request is justified. The City will use the data collected from this process over time to establish consistent criteria and thresholds for alternatives to compliance with the Green Building Policy.

2019 GREEN BUILDING POLICY | Leadership in Energy and Environmental Design (LEED)

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS		CREDIT	POINTS		CREDIT	POINTS		CREDIT
			Private	Public		Private	Public		Private	Public	
LEED BUILDING DESIGN AND CONSTRUCTION (BD+C)	Silver	Gold	5	7	Optimize Energy Performance	4	4	Indoor Water Use Reduction	1	1	Low-Emitting Materials
			2	3	Renewable Energy Production				1	1	Construction Indoor Air Quality Management Plan
			1	1	Advanced Energy Metering[2]	1	1	Outdoor Water Use Reduction	1	1	Thermal Comfort
			Optional	3	Enhanced Commissioning				Optional	2	Daylight
									Optional	1	Indoor Air Quality Assessment

NOTES: 1) Refer to LEED Credit Library for point criteria.
2) Applies to non-residential projects only (excludes hotels).

2019 GREEN BUILDING POLICY | Green Globes

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS									
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY			
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
GREEN GLOBES NEW CONSTRUCTION (NC)	2 Green Globes	3 Green Globes	60	68	**3.3.1.1** Assessing Energy Performance (Path A, B, or C)	24	24	**3.4.1.1** Indoor Water Consumption	11	11	**3.7.1.1** Ventilation Air Quality
			9	9	**3.3.9.1.1** On-site Renewable Energy Feasibility Study				8	8	**3.7.1.2** Air Exchange
			-AND-			6	6	**3.2.4.1** Landscape and Irrigation Plan (LIP) by Certified Professional	10	10	**3.7.2.1** Volatile Organic Compounds
			23	23	**3.3.9.1.2** On- or Off-site Renewable Energy						
			-OR-			3	3	**3.2.4.1.1** Soil Type, Drainage and Light Conditions			
			18	18	**3.3.9.2.1** Off-site Renewable Energy						
			-OR-								
			32	32	**3.3.9.1.2** (Partial) and **3.3.9.2.1** (Partial)	2	2	**3.2.4.3.2** Native/Non-invasive Plant Material	5	5	**3.1.2.4** IAQ During Construction
			COMMISSIONING								
			Optional	4	**3.1.3.2.1.1** HVAC and Refrigeration Systems	3	3	**3.2.4.3.3** Turfgrass Minimalized			
			Optional	3	**3.1.3.2.1.5** Plumbing						
			Optional	1	**3.1.3.2.1.6** Electrical	1	1	**3.4.8.2.2** Drip/low Volume Irrigation[3]	Optional	3	**3.1.2.4.2** IAQ of Occupied Areas During Construction
			Optional	1	**3.1.3.2.1.7** Lighting						
			Optional	1	**3.1.3.2.1.8** Building Automation				2-12	2-12	**3.7.4** Thermal Comfort
			Optional	1	**3.1.3.3.1** Training Requirements						
			Optional	6	**3.1.3.4.1** Operations and Maintenance Manuals	1	1	**3.4.8.2.3** WaterSense/SWAT/Smart Control System[3]	Optional	8	**3.3.5.4** Daylighting
			METERING, MEASUREMENT AND VERIFICATION[2]								
			1	1	**3.3.3.1.1.1** Electricity	0.5	0.5	**3.4.8.2.4** Regulation of Precipitation Rate on Sprinkler[3]	Optional	7	**3.7.3.1.1** Daylighting
			1	1	**3.3.3.1.1.2** Heating Fuels						
			1	1	**3.3.3.1.1.4** Other, with description (as applicable)	0.5	0.5	**3.4.8.2.5** Swing Joints/Flex Pipes on Irrigation Heads[3]	Optional	2	**3.1.2.4.1** IAQ During Construction Indoor Air Quality Test Pathway
			0.5 - 3	0.5 - 3	**3.3.3.1.2** Sub-metering (as applicable)						

NOTES: 1) Refer to Appendix A: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Green Globes" for Performance Point criteria.
2) Applies to non-residential projects only (excludes hotels).
3) Credit is only applicable if an automated irrigation system is installed.

2019 GREEN BUILDING POLICY | EarthCraft Multifamily

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
EARTHCRAFT MULTIFAMILY (ECMF)	Gold	N/A	2-5	N/A	**IN 1.1** Solar, Micro-hydro, Wind Electric **IN 1.2** Solar-ready Design **IN 1.3** Solar Electric System or **IN 1.5** Common Areas Solar Electric Use	INDOOR WATER USE			4	N/A	**IAQ 2.7** VOC Materials and **IAQ 2.12** Zero Carpet in Units
						9-14	N/A	**WE 1.2** Water Treatment **WE 1.3** Water Softeners **WE 1.4** Storage **WE 1.5.1** WaterSense Toilet **WE 1.5.2** WaterSense Urinal **WE 1.5.3** WaterSense Lavatory Faucet **WE 1.5.4** WaterSense Showerhead **WE 1.6** Toilet < 1.1 gallon/flush			
			1-2	N/A	**EO 3.4** Light Commercial Community Center (as applicable) or **EO 3.5** Light Commercial Ready Spaces (as applicable)	-OR-					
						5-10	N/A	**WE 1.2** Water Treatment **WE 1.3** Water Softeners **WE 1.5.1** WaterSense Toilet **WE 1.5.2** WaterSense Urinal **WE 1.5.3** WaterSense Lavatory Faucet **WE 1.5.4** WaterSense Showerhead **40%** Reduction from Baseline	2	N/A	**BE 3.15** Insulation **BE 3.16** Walls **BE 3.17** Exterior Insulation **BE 3.18** Ceilings **BE 3.19** Attic Kneewalls or **BE 3.20** Insulate Roofline
			COMMISSIONING			OUTDOOR WATER USE					
			Optional	N/A	**EO 2.3** Pre-occupancy Briefing	4-9	N/A	**WE 2.4** Turf <40% **WE 2.5** Vegetate 4:1 Slopes **WE 2.7** Drought Tolerant/Native Plants **WE 2.8** Guidebook and **WE 2.6** Irrigation[2]			
			Optional	N/A	**EO 2.4** Post-occupancy Briefing						
			Optional	N/A	**EO 2.5** Environmental Management and Building Maintenance Guidelines for Staff	-OR-			1	N/A	**IAQ 2.9** Pre-occupancy Flush
						3	N/A	**WE 2.10.1** Greywater Irrigation[2]			
			Optional	N/A	High-rise Addendum	-OR-					
			METERING								
			Optional	N/A	**IN 1.7 12** Months Post-Construction Energy Monitoring	3	N/A	**WE 2.10.2** Rainwater Irrigation[2]			

NOTES: 1) Refer to Appendix B-1: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Earthcraft Multifamily (ECMF)" for Performance Point criteria.
2) Credit is only applicable if an automated irrigation system is installed.

2019 GREEN BUILDING POLICY | EarthCraft Light Commercial

RATING SYSTEM	MINIMUM LEVEL OF CERTIFICATION		PERFORMANCE POINTS								
			ENERGY USE REDUCTION			WATER EFFICIENCY			INDOOR ENVIRONMENTAL QUALITY		
	Private	Public	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT	POINTS Private	POINTS Public	CREDIT
EARTHCRAFT LIGHT COMMERCIAL (ECLC)[2]	Certified	Gold	1	1	**BE 1A** Envelope Air Tightness Test	INDOOR WATER USE			2	2	**IEQ 5** Certified Flooring **IEQ 6** Composite Wood or **IEQ 7** Product Transparency
			1	1	**ES 5** High Performance Duct System	3	3	**WE 1A** High Efficiency Toilets **WE 1B** Pint Flush or Waterless Urinals **WE 1C** Automatic Faucets, and/or **WE 1D** High Efficiency Showerheads	1	1	**IEQ 1** Decoupled Ventilation **IEQ 2** (DCV) **IEQ 3** Air Filtration Media or **IEQ 4** Radon Exposure Prevention
			-AND-								
			1	1	**IN 1** Renewable Energy Installation						
			-OR-								
			2	2	**IN 2** Renewable Energy Procurement						
			COMMISSIONING						Optional	1	**BE 7** Daylighting Design Strategies
			Optional	3	**EO 1** Building Systems Commissioning	OUTDOOR WATER USE					
			METERING			3	3	**WE 2** Landscape Plan **WE 3** Efficient Irrigation System and/or No Irrigation and/or **WE 4** Non-potable Water Source Used for Irrigation[3]	PR[4]	PR[4]	**IEQ R3** Minimize Indoor Air Contamination
			PR[4]	PR[4]	**EO R1** Utility Tracking						

NOTES: 1) Refer to Appendix B-2: "City of Alexandria, VA Performance Design Targets – Directed Use Criteria ("Performance Points") for Earthcraft Light Commercial (ECLC)" for Performance Point criteria.
2) Applicable to commercial buildings, schools and public facilities up to 80,000 square feet.
3) Credit is only applicable if an automated irrigation system is installed.
4) PR = Program Requirement; no points assigned.

APPENDIX A: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS – DIRECTED USE CRITERIA ("PERFORMANCE POINTS") FOR **GREEN GLOBES FOR NEW CONSTRUCTION (NC).**

For additional information, refer to the Green Globes for New Construction Technical Reference Manual v1.50.

As part of achieving a minimum certification of Two Green Globes for private projects, or Three Green Globes for public projects in the City of Alexandria, VA, Green Globes projects must fulfill the following Green Globes criteria:

ENERGY

Energy Reduction for Private Projects

Green Globes Criteria: 3.3.1.1: All private projects must achieve a minimum of 60 points under Pathways A, B, or C, identified in criteria 3.3.1.1 for an EUI > 30% (60 points)

Energy Reduction for Public Projects

Criteria 3.3.1.1: All projects must achieve a minimum of 68 points under Pathways A, B, or C, identified in criteria 3.3.1.1 for an EUI ≥ 35% (68 points)

Renewable Energy for Private Projects

3.3.9.1.1.: Perform feasibility study under criteria 3.3.9.1.1 to determine whether 5% onsite renewable energy equipment or 40% off-site renewable energy equipment is achievable for the project (9 points)

Per the result of the feasibility study, achieve these criteria by following one of the three paths below:

PATH 1: Criteria 3.3.9.1.2: Installation of 5% or greater **on-site** renewable energy; or installation of 40% or greater **off-site** renewable energy. (23 points)

OR

PATH 2: Criteria 3.3.9.2.1: Procurement of RECs and/or offsets for 200% of building energy for a minimum of three years (18 points)

OR

PATH 3: Achieve Criteria 3.3.9.1.2 for installation of either 2% on-site or 20% off-site renewable energy equipment (14 points) **AND** achieve 3.3.9.2.1 for procurement of RECs and/or offsets for 100% of building energy for minimum of three years (18 points).

Renewable Energy for Public Projects

3.3.9.1.1.: Perform feasibility study under criteria 3.3.9.1.1 to determine whether a minimum of 10% onsite renewable energy equipment or 60% off-site renewable energy equipment is achievable for the project (9 points)

Per the result of the feasibility study, achieve these criteria by following one of the three paths below:

PATH 1: Criteria 3.3.9.1.2: Installation of 10% or greater **on-site** renewable energy; or installation of 60% or greater **off-site** renewable energy (23 points)

OR

PATH 2: Criteria 3.3.9.2.1: Procurement of RECs and/or offsets for 200% of building energy for a minimum of six years (18 points)

OR

PATH 3: In cases where the onsite/offsite renewable energy goals may be partially achieved, Criteria 3.3.9.1.2 for installation of either a minimum of 5% on-site or 30% off-site renewable energy equipment (14 points) **AND** achieve 3.3.9.2.1 for procurement of RECs and/or offsets for 100% of building energy for minimum of six years (18 points).

Commissioning for Public Projects (Optional for Private Projects)

The City of Alexandria recommends that all private projects attempt to include Commissioning whenever possible, although it is not required for private projects. Public projects must fulfill commissioning criteria related to mechanical systems, plumbing, and electrical, specifically by utilizing the following Green Globes Criteria:

3.1.3.2.1.1., HVAC and refrigeration systems (4 points)
3.1.3.2.1.5., Plumbing (3 points)
3.1.3.2.1.6., Electrical (1 point)
3.1.3.2.1.7., Lighting (1 point)
3.1.3.2.1.8., Building automation (1 point)
3.1.3.3.1., Training requirements (1 point)
3.1.3.4.1., Operations and Maintenance manuals (6 points)
Total points: (17 points)

*Advanced Energy Metering for Public and Private Projects**

All applicable points in the following Green Globes Criteria related to whole building/significant use metering must be fulfilled (*as applicable to the building's systems*):

3.3.3.1.1.1., Electricity (1 point)
3.3.3.1.1.2., Heating Fuels (1 point)
3.3.3.1.1.3., Steam (1 point)
3.3.3.1.1.4., Other, with description (1 point)
Total possible points for this section: (4 points)

And, for the following end uses making up over 10% of the building load, *as applicable to the building*:
3.3.3.1.2.1., Sub-metering on lighting and lighting controls by floors or zones (0.5 points)
3.3.3.1.2.2., Sub-metering on plug loads by floor or zones (0.5 points)
3.3.3.1.2.3., Sub-metering on major electric HVAC equipment (0.5 points)
3.3.3.1.2.4., Sub-metering on chilled water generation (0.5 points)
3.3.3.1.2.5., Sub-metering for onsite renewable energy generation (0.5 points)

3.3.3.1.2.6., Sub-metering for heating water or steam generation (0.5 points)
Total possible points for this section: (3 points)

**Applies to non-residential projects only, excluding hotel projects. Such projects are excluded from being required to comply with these criteria, although the City of Alexandria urges projects to consider compliance with these criteria, where possible.*

WATER EFFICIENCY

Indoor Water Use for Public and Private Projects

The following Green Globes Criteria must be fulfilled:

3.4.1.1, Projected water consumption determined to be less than the baseline by a minimum of 40% (24 points)

Outdoor Water Use for Public and Private Projects

The following Green Globes Criteria must be fulfilled through a project achievements in both landscaping (Site), and irrigation systems (Water) performance:

3.2.4.1., Landscape Irrigation Plan (LIP) by Landscape Architect (6 points)
3.2.4.1.1., LIP for soil type, drainage and light (3 points)
3.2.4.3.2., Native/Non-invasive plants (2 points)
3.2.4.3.3., Turf grass minimalized (3 points); and
-The following criteria and points are only applicable if an automated irrigation system is installed-
3.4.8.2.2., Drip/low volume irrigation (1 point)
3.4.8.2.3., Watersense/SWAT/Smart Control system (1 point)
3.4.8.2.4., Regulation of precipitation rate on sprinkler systems (0.5 point)
3.4.8.2.5., Swing joints/Flex pipes on irrigation heads (0.5 point)

INDOOR ENVIRONMENTAL QUALITY

Indoor Environmental Quality for Public and Private Projects

The following Green Globes Criteria must be fulfilled:

3.1.2.4 IAQ During Construction (5 points maximum)
3.3.5.4 Daylighting (8 points) (public buildings only)
3.7.3.1.1 Daylighting (7 points) (public buildings only)
3.7.1.1 Ventilation Air Quantity (11 points)
3.7.1.2 Air Exchange (8 points)
3.7.2.1 Volatile Organic Compounds (10 points)
3.7.4 Thermal Comfort (up to 12 points depending on building use/purpose)

Indoor Air Quality for Public Projects

3.1.2.4.1 IAQ During Construction: Indoor Air Quality Test pathway (2 points)
3.1.2.4.2 IAQ of Occupied Areas During Construction (3 points)

APPENDIX B-1: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS ("PERFORMANCE POINTS") – DIRECTED USE CRITERIA FOR **EARTHCRAFT MULTIFAMILY (ECMF).**

For additional information, refer to the EarthCraft Multifamily Technical Guidelines.

The EarthCraft Multifamily rating system is not applicable to public projects. For private projects, as part of achieving the minimum certification requirements for EarthCraft Gold, the following must also be completed projects in the City of Alexandria:

ENERGY:

Renewable Energy

Achieve one of the four paths below:

IN 1.1: Solar, micro-hydro, or wind electric system (4 points)

OR

IN 1.2: Solar-ready design (2 points)

OR

IN 1.3: Solar electric system (5 points)

OR

IN 1.5: Common areas use solar electric system (4 points)

Community Buildings/Commercial Spaces (as applicable for mixed-use developments with ground floor commercial use and multifamily units above).

Achieve one of the two following credits:

EO 3.4: EarthCraft Light Commercial for community center (2 points)

OR

EO 3.5: EarthCraft Light Commercial ready spaces (1 point)

Commissioning (optional)

Achieve the following credits:

EO 2.3: Provide pre-occupancy briefing for tenant (2 points)
EO 2.4: Project participates in post-occupancy debriefing (2 points)
EO 2.5: Environmental management and building maintenance guidelines for staff (2 points)
Achieve all applicable items on the High Rise Addendum (applicable for low-, mid-, and high-rise projects)

Advanced Metering (optional)

Achieve the following credit:

IN 1.7: Developer contracts for at least 12 months post-construction energy monitoring (6 points)

WATER EFFICIENCY

Indoor Water Use

Achieve one of the two paths below:

PATH 1: Earn a minimum of 9 points and up to 14 points from any combination of the following credits:

WE 1.2: Water treatment system NSF certified (2 points)
WE 1.3: Water softeners certified to NSF/ANSI Standard 44 (2 points)
WE 1.4: Store < .5 gallons of water between water heater and furthest fixture (2 points)
WE 1.5.1: WaterSense toilet (2 points); WE 1.5.2: WaterSense urinal (1 point)
WE 1.5.3: WaterSense lavatory faucet (1 point);
WE 1.5.4: WaterSense showerhead (2 points) and
WE 1.6: Toilet < 1.1 gallon/flush (2 points)

OR

PATH 2: Earn a minimum of 5 points and up to 10 points from any combination of the following credits:

WE 1.2: Water treatment system NSF certified (2 points)
WE 1.3: Water softeners certified to NSF/ANSI Standard 44 (2 points)
WE 1.5.1: WaterSense toilet (2 points)
WE 1.5.2: WaterSense urinal (1 point);
WE 1.5.3: WaterSense lavatory faucet (1 point)
WE 1.5.4: WaterSense showerhead (2 points); and demonstrate a 40% reduction from the baseline through the Indoor Water Use Calculator

Outdoor Water Use

Achieve one of the three paths below:

PATH 1: Earn a minimum of 4 points and up to 9 points from any combination of the following credits:

WE 2.4: Turf <40% of landscaped area (2 points);
WE 2.5: Vegetate slopes exceeding 4:1 (1 point);
WE 2.7: Drought-tolerant/native landscaping turf and plants (1 point);
WE 2.8: Xeriscape guidebook given to property manager or owners (1 point); and
WE 2.6: Irrigation (4 points) (WE 2.6 is only applicable if automated irrigation is installed)

OR

OR

PATH 3: WE 2.10.2: Rainwater irrigation system (3 points) (only applicable if automated irrigation is installed)

INDOOR ENVIRONMENTAL QUALITY

Achieve the following:

Earn a total of 4 points between IAQ 2.7: Certified low or no VOC materials and IAQ 2.12: No carpet in all units

AND

Earn a total of 2 points from any combination of the following credits:

BE 3.15: Insulate with foam insulation
BE 3.16: Walls
BE 3.17: Continuous exterior insulation
BE 3.18: Ceilings
BE 3.19: Attic kneewalls, and/or
BE 3.20: Insulate roofline

AND

Achieve IAQ 2.9: Pre-occupancy flush (1 point)

APPENDIX B-2: CITY OF ALEXANDRIA, VA PERFORMANCE DESIGN TARGETS ("PERFORMANCE POINTS") – DIRECTED USE CRITERIA FOR **EARTHCRAFT LIGHT COMMERICAL (ECLC) v2.1.**

For additional information, refer to the EarthCraft Light Commercial Technical Guidelines.

As part of achieving the minimum certification requirements for EarthCraft Light Commercial (ECLC) Certified for private developments and ECLC Gold for public developments, the following must also be completed for projects in the City of Alexandria:

ENERGY:

Energy for Private Projects:

Achieve the following credits:

BE 1A: Measured ELR75 is 0.30 or better (1 point)

AND

ES 5: High Performance Duct System (1 point)

AND

IN 1: Renewable Energy Installation of 5% or greater on-site renewable energy; or installation of 40% or greater off-site renewable energy. (1 point)

OR

IN 2: Renewable Energy Procurement of RECs and/or offsets for 200% of building energy for a minimum of three years (2 points)

Energy for Public Projects:

Achieve the following credits:

BE 1A: Measured ELR_{75} is 0.30 or better (1 point)

AND

ES 5: High Performance Duct System (1 point)

AND

IN 1: Renewable Energy Installation of 10% or greater **on-site** renewable energy; or installation of 60% or greater **off-site** renewable energy. (1 point)

OR

IN 2: Renewable Energy Procurement of RECs and/or offsets for 200% of building energy for a minimum of six years (2 points)

Commissioning for Public Projects (Optional for Private Projects)

Achieve the following credit:

EO 1: Building Systems Commissioning (3 points)

WATER USE:

Indoor Water Use

Earn a total of 3 points from any combination of the following credits:

WE 1A: High Efficiency Toilets
WE 1B: Pint Flush or Waterless Urinals
WE 1C: Automatic Faucets and/or
WE 1D: High Efficiency Showerheads

Outdoor Water Use

Earn a total of 3 points from any combination of the following credits:

WE 2: Xeriscape Landscape Plan
WE 3: Efficient Irrigation System or No Irrigation System and/or
WE 4: Non -Potable Water Source Used for Irrigation (WE 4 is only applicable if an automated irrigation system is installed)

INDOOR ENVIRONMENTAL QUALITY

Achieve 4 points from the following credits:

Earn a total of 1 point from any combination of the following credits:

IEQ 1: Decoupled Ventilation
IEQ 2: Demand Control Ventilation (DCV)
IEQ 3: Air Filtration Media: MERV 11 or Higher or
IEQ 4: Radon Exposure Prevention

AND

Earn a total of 2 points from any combination of the following credits:

IEQ 5: Certified Flooring
IEQ 6: Composite Wood Contains No Added Urea-Formaldehyde or
IEQ 7: Product Transparency Label Material Selection

AND

Earn 1 point from BE 7: Daylighting Design Strategies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Adopted July 9, 2019

CITY OF ALEXANDRIA, VIRGINIA