

## 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 Company DASH the Pentagon**

periods. DASH operates 54 energy efficient and electric buses, representing 60% of its fleet. It is estimated that these buses will reduce annual diesel fuel consumption 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.



**of the Alexandria Transit (ATC) DASH service and Fleet** – operates 12 routes and serves all of Alexandria Metrorail Stations and the Metrorail station during peak environmental friendly hybrid electric buses. It is estimated that ATC's hybrid electric buses will reduce annual diesel fuel consumption and carbon dioxide emissions by 60,000 gallons and carbon dioxide emissions by 1,300,000 lbs.



**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 fund 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

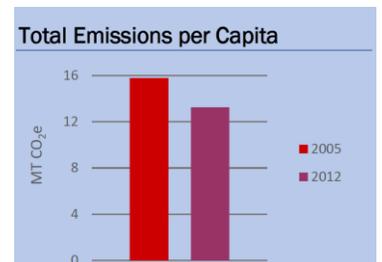


### City Eliminated the Largest Air Pollutant Source in the City and Northern Virginia

– 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<sub>10</sub> 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 Van Dorn Corridor Plan, Waterfront Eisenhower West, North Potomac 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.

plans including the Landmark Plan, and the Beauregard, Yard and Old Town North Small



## 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.



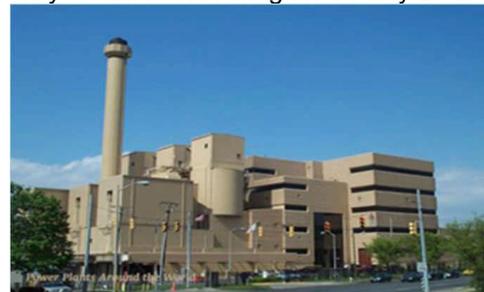
## SOLID WASTE MANAGEMENT



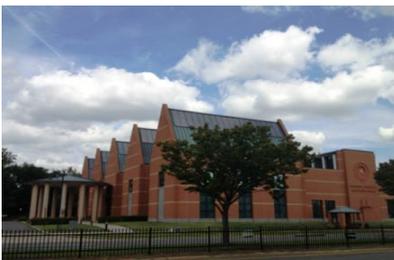
**City's Solid Waste Recycling Rate Increased Steadfastly toward the 2020 Target of 50%** –Starting with a solid waste recycling rate below 30% when the Environmental Action Plan was adopted in 2009; the City reported its highest ever recycling rate of 49.3% to the Virginia DEQ for Calendar Year 2016, 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 landfiling. 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<sub>2e</sub>). 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.

