



Fairfax County Government and Schools Zero Waste Plan



September 2021



FAIRFAX COUNTY
— VIRGINIA —



Content

- How the Plan Came to Be 1
- Our Community 1
- Our Opportunity..... 1
- What Zero Waste Means to Us..... 2
- Circular Economy 4
- Where We Are Now 5
 - About Our Government and Schools 5
 - Current Waste Prevention, Diversion, and Management..... 6
 - Engagement 14
 - Policies and Regulations..... 14
- Overall Diversion Performance 16
 - Trash and Recycling Composition Audits..... 18
 - Employee Survey Results..... 29
- Other Communities' Zero Waste Efforts 29
- Strategies 30
 - 50 Zero Waste Options 30
 - 24 Strategies 30
 - Implementation Schedule 42
 - Health, Safety, and Zero Waste 47
- How We Will Achieve Zero Waste 47
 - Levels of Involvement 47
 - Required Resources 49
 - Ensuring and Measuring Progress 49
 - Short-Term Priorities for 2022 50
- Commencement..... 52

Tables

- Table 1: Diversion Rate for County 17
- Table 2: FCPS Diversion Rate..... 17

Figures

- Figure 1: Four Essential Strategies 3
- Figure 2: County Goals..... 4



Figure 3: Waste Management 6
Figure 4: Logistics Center.....13
Figure 5: Forte Support Center.....14
Figure 6: Trash Composition Audit Results For County Facility Locations19
Figure 7: County Facilities Divertable Materials in Trash (% By Volume)20
Figure 8: County Facility Divertable Materials in Trash, Rate Per Facility Type (% By Volume)20
Figure 9: Trash Composition Audit Results for Schools.....21
Figure 10: School Divertable Materials in Trash (% By Volume)22
Figure 11: Recycling Composition Audit Results for County Facilities.....23
Figure 12: County Recycling Contamination (% By Volume).....23
Figure 13: Recycling audit contamination rate contamination rate results for county facilities (per facility type)24
Figure 14: Recycling Composition Audit Results for Schools25
Figure 15: School Recycling Contamination (% By Volume)25
Figure 16: Recoverable or Divertable Materials in the Trash Stream (% By Volume).....26
Figure 17: Contamination in the Recyclables Stream (% By Volume)26
Figure 18: Overall Trash Audit Results (% By Volume)27
Figure 19: Average Recycling Composition Audit Results for all Locations (% By Volume)27
Figure 20: Overall Recycling Contamination Rates (% By Volume).....28
Figure 21: Average Recycling Composition Audit Results for all Locations (% By Volume)28
Figure 22: Organization-Wide Focus on Zero Waste51

Appendices

- Appendix A – 2020 Diversion Report
- Appendix B - Current Conditions Report
- Appendix C – Waste and Recycling Audit Memo
- Appendix D - Zero Waste Employee Survey Report
- Appendix E - Literature Search Report
- Appendix F - Zero Waste Strategy Details & Impact Matrix



List of Acronyms

CAR	County Agency Route
C&D	Construction & Demolition Debris
DPMM	Department of Procurement and Material Management
DVS	Department of Vehicle Services
EPP	Environmentally Preferable Purchasing
RRF	Resource Recovery Facility
FCBOS	Fairfax County Board of Supervisors
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
SWMP	Fairfax County's Solid Waste Management Program
FEEE	Fairfax Employees for Environmental Excellence
JET	Joint Environmental Task Force
LEED	Leadership in Energy and Environmental Design
MRF	Materials Recycling Facility
MSW	Municipal Solid Waste
NWF	National Wildlife Federation
OCC	Cardboard
PET	Polyethylene Terephthalate
Plan	Fairfax County Government and Schools Zero Waste Plan
PP	Polypropylene
PFM	Public Facilities Manual
PPE	Personal Protective Equipment
SOPs	Standard Operating Procedures
SWMP	Solid Waste Management Program
VPPA	Virginia Public Procurement Act



How the Plan Came to Be

In late 2018, the Fairfax County Board of Supervisors (FCBOS) called upon Fairfax County staff to identify potential environmental collaboration areas with Fairfax County Public Schools (FCPS). As a result of that effort, the County established the Joint Environmental Task Force (JET), comprised of two FCBOS members, two FCPS School Board members, and community representatives. The purpose of the JET was to be proactive and equitable while addressing climate change and environmental sustainability. In 2019, the JET worked to establish its mission and determine focus areas for further development by subcommittees for energy, transportation, waste management and recycling, and workforce development. The JET's Waste Management and Recycling Subcommittee set a bold goal for Fairfax County government and schools: **Zero Waste by 2030**. With just nine years to eliminate waste production by the area's government and schools, a Zero Waste Planning Team was assembled to begin developing this Zero Waste Plan at the onset of 2021. The Zero Waste Planning Team consists of staff from Fairfax County's Solid Waste Management Program (SWMP), Department of Procurement and Material Management (DPMM), Facilities Management Department, Park Authority, FCPS Office of Facilities Management, and FCPS Get2Green.

Our Community

A future without waste requires everyone to do their part. While this Plan applies to government and school operations, many community members use schools, libraries, rec centers, parks, and other municipal facilities in Fairfax County every day. Everyone who enters a government building or school or visits a park plays an important role in helping reach Zero Waste. The Zero Waste Team will take into consideration the many community members who spend time at Fairfax County's facilities and the role these individuals and groups can play in reducing waste. Educating visitors on waste reduction is a top priority. In addition to impacting municipal operations, this Plan aims to provide inspiration and best practices for people, businesses, and other institutions throughout the community.

Our Opportunity

This Fairfax County Government and Schools Zero Waste Plan (Plan) is a guide for Fairfax County's municipal operations to transition to a future without waste. As the most populous county in the Washington D.C. metropolitan area, Fairfax County has a tremendous opportunity and responsibility to rethink the way its operations consume and dispose of materials to reduce the environmental impact.

Zero Waste is much more than a waste diversion effort. It is about better managing materials across their entire lifecycle, creating a ripple effect of benefits for society. For example, reducing, reusing, and recycling materials decreases solid waste, prevents litter, and reduces the climate-warming emissions and other pollution that are caused



by the extraction of raw materials. Zero Waste efforts also create opportunities for new, greener business models and innovations around sharing, reusing, and salvaging materials. These innovations support a transition to a circular economy.

Addressing waste at its source by systematically reducing and reusing materials holds the greatest promise for preventing waste, reducing greenhouse gas emissions, and protecting the environment. Therefore, this Plan includes many recommendations aligned with these “upstream” strategies, in addition to more traditional “downstream” strategies such as improving recycling and composting.

Among the most important actions we can take are ones to collaborate with, educate, and empower the staff, students, and community members who will be part of this Zero Waste journey.

In addition to specific recommendations for achieving Zero Waste, this Plan also takes a deep dive into current waste reduction and management conditions, including a trash and recycling audit, employee input, and a framework for implementing the Plan.

This Plan is intended to be a living document that provides direction and key recommendations to set Fairfax County government and school operations on the path to Zero Waste. This ambitious goal will be achieved with flexibility, determination, and teamwork.

What Zero Waste Means to Us

Zero Waste is a philosophy, commitment, and design principle seeking to minimize waste to close to nothing by adopting a holistic and climate-conscious approach to the vast flow of resources and waste that move through society.¹

Working toward Zero Waste in government and school operations involves four essential strategies – Reach out, Reduce, Reuse, and Recycle.



The 4 R's



Reach out

Create a culture of sustainability by engaging individuals to pursue Zero Waste through collaboration, education, and outreach.



Reduce

Minimize consumption to only what is necessary. Phase out single-use products and packaging wherever possible.



Reuse

Support a circular economy by purchasing more durable, reusable, repairable, and recyclable materials that are produced sustainably. Adopt closed-loop systems.



Recycle

Once products and packaging can no longer serve their intended purpose, treat materials as valuable resources rather than waste by recycling or composting.

FIGURE 1: FOUR ESSENTIAL STRATEGIES

In striving for Zero Waste in its government and school operations, Fairfax County will:

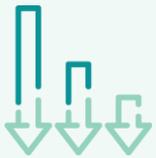
- **Recognize everyone has a role to play**—government leadership, suppliers, staff, students, and patrons—and will provide education and other assistance to facilitate change.
- **Embrace opportunities to support social benefits** such as climate goals and economic development.
- **Lead, partner with, and learn from others** to establish a Zero Waste future.



Through these strategies, Fairfax County's aspirational goal for its government and schools is two-fold. By 2030, we will:



Divert 90% of waste from disposal.²



Reduce the overall waste generated by 25% from 2018 levels.

% as based on tonnage/weight

FIGURE 2: COUNTY GOALS

Circular Economy

To achieve Zero Waste, there needs to be a reframing and restructuring of how product lifecycles are viewed and handled. Most societies have adopted a traditional linear economy, meaning raw natural resources are extracted and made into single-use products before being disposed of in a landfill or incinerated. While there is some reuse and recycling of both renewable and non-renewable resources in a linear economy, reuse and recycling are not the majority practice nor the focus. In a circular economy, there is significant focus on reduction, reuse, and recycling so that nothing is landfilled or incinerated. In other words, Zero Waste is achieved.

A circular economy is based on the principles of designing out waste and pollution, keeping products and materials in use, and regenerating natural systems.¹

Two different approaches, "upstream" and "downstream", can be used to develop a circular economy. In an upstream approach, waste is prevented at its source: reducing consumption (overall or for certain materials) and systematically reusing products decreases the amount of material that could eventually become waste. Examples include banning the use of unsustainable materials like Styrofoam or installing air hand



dryers to decrease the need for single-use paper towels. In a downstream approach, waste mitigation is addressed at the point of disposal, typically through enhancing recycling programs so that discarded materials may be remanufactured into new products rather than landfilled.

Upstream approaches, which prevent waste before it is even created, consistently create the greatest positive environmental impact, however both upstream and downstream approaches contribute to the benefits associated with a circular economy. Implementation of these approaches leads to decreased extraction of raw, virgin materials, decreased greenhouse gas emissions that contribute to climate change, decreased need for landfill space and incineration, and increased energy savings in product manufacturing.

Where We Are Now

About Our Government and Schools

Despite an operational focus, the scope of this Zero Waste Plan is significant. Fairfax County is the most populous county in Virginia with 1.2 million residents. It covers 420 square miles and is a mix of urban, suburban, and rural land use. In support of this diverse community, the County Government has 46 departments and provides a countless number of important services to the community. These departments include Finance, Procurement, Human Resources, Human and Social Services, Information Technology, Facilities Management, Public Works and Environmental Services—which includes stormwater, wastewater, solid waste, and capital facilities—Vehicle Services, Transportation, the Park Authority, and more.

The County operates 252 facilities including government offices, public safety buildings (fire, police, etc.), operational/maintenance facilities, public places (courts, community centers, libraries, etc.), and social service facilities, plus 427 parks spanning 24,000 acres operated by the Park Authority. These operations are supported by a 13,000-strong workforce. Fairfax County Government is well known nationally for many of its innovative and award-winning community services.

FCPS is also notably large and impactful. Along with providing excellent educational programs, waste generation ranges from electronic devices provided to every student in 2020 to managing one of the largest school bus fleets in the country. FCPS enrolls 180,000 students and employs 25,000 staff. It operates 207 physical locations including 198 schools. FCPS has a similar set of departments to the County operations which span from internal services to operations.

Waste generated within County and FCPS operations includes three primary types:

- **Operationally generated waste.** This includes everything from waste generated by fleet vehicle maintenance to electronic waste to construction and demolition debris.



- **Staff and student generated waste.** Staff and student lunches offer a prime example of this waste type. Waste from meals, whether brought from home, a restaurant, or a facility cafeteria, finds its way into our waste stream.
- **Waste generated by facility users, park patrons, clients, etc.** The Park Authority estimates that 14 million people visit its parks, rec centers, golf courses, athletic fields, and other facilities each year. Countless other resident interactions and public facility uses occur daily.

The pursuit of Zero Waste by 2030 will not be easy. In addition to these challenging waste types, the County's waste management system involves many stakeholders with different objectives. While the challenge is steep, the journey offers significant rewards for generations to come. The next section outlines both current waste management practices as well as innovative diversion programs already in operation.



FIGURE 3: WASTE MANAGEMENT

Current Waste Prevention, Diversion, and Management

Trash and Recycling

Trash and recycling are the primary waste streams managed at County and FCPS facilities. The path to Zero Waste requires system change, department/facility change, and individual behavior change. Each aspect of the process is outlined in detail below.

At the system level, all County and FCPS trash is routed to the Covanta Fairfax, LLC Waste-to-Energy facility located at the I-95 Landfill Complex. The trash is incinerated and generates energy in the process. The resulting ash is deposited in the landfill on the same property.



Recyclables are routed to contracted Material Recycling Facilities (MRFs) for processing and sale. FCPS uses a separate contract for recyclables processing and sale which also includes hauling services. While the contracting process enables negotiation of terms, such as revenue for certain materials and costs for contaminants and processing, the limited number of MRFs in the region affects pricing and accepted materials. Both the County and FCPS contracts are for single-stream (commingled) recycling. Acceptable materials are dictated by the contracted MRF and change over time. The County and FCPS are responsible for disseminating this information to staff, students, and facility users alike. With regional and national economic forces influencing the viability of all recycling programs, managing contamination remains a key strategy for Fairfax County to achieve long-term sustainability.

The County and FCPS haul waste to processors in different ways. Hauling for waste generated at county facilities is provided by the Fairfax County SWMP. The SWMP operates a County Agency Route (CAR) that provides trash and recycling collection. Services include compactor and dumpster collection. While the County currently operates a single-stream recycling program, it has previously operated a dual-stream (material-specific) program. As a result, dumpsters outside some facilities have inconsistent signage and function compared to currently acceptable materials. Additionally, long-term operational changes have resulted in a small number of buildings that do not have recycling services. SWMP hauling offers advantages such as efficient coordination with Zero Waste recommendations. FCPS uses two private third-party contracted haulers to service all trash and recycling dumpsters. The contractors also provide FCPS with educational resources and support.

Inside County and FCPS facilities, the collection of trash and recycling is managed in a variety of ways. The County's Facilities Management Department oversees most facilities and coordinates contracted custodial services. These contracted services are customized to meet individual building needs. Custodial contractors collect waste from workspaces and common areas and deposit the waste in building dumpsters. Departments who operate their own facilities (such as the Department of Public Works and Environmental Services, Park Authority, etc.) oversee their own collection schemes. The County also uses leased office space. In these scenarios, the waste hauling and custodial service details are documented in lease terms and services are provided by property management companies.

FCPS manages their facility operations in a similar way apart from an in-house custodial workforce. FCPS's Department of Facilities and Transportation Services oversees this workforce in addition to all building management functions.

Departments, schools, and/or facilities then provide another layer of management. This includes deploying their own purchased receptacles or organizing waste collection infrastructure to meet their needs. Encountering different types of bins and signs in different buildings or even different areas of the same building is a common experience in County and FCPS facilities. Inconsistent internal collection systems can create



challenges and confusion for custodial staff, employees, students, and visitors alike. The Park Authority also operates an extensive waste collection program for publicly located receptacles (i.e., parks and athletic fields). Recycling bins are minimally deployed in these locations due to high contamination rates and collection costs.

The performance of this complex waste management system depends on a coordinated approach at all levels.

Recycling at Fleet Vehicle Maintenance Facilities

The County's Department of Vehicle Services (DVS) operates four maintenance facilities. The Alban Maintenance Facility (DVS Alban) is an example of advanced



recycling activities. DVS Alban routes used tires, oil, oil filters, antifreeze and other chemicals, aerosol cans, automotive batteries, and miscellaneous scrap metals to various recycling contractors specializing in those materials. Additionally, they also work with a retreading contractor to extend the useful life of their tires and save money whenever possible. As a result, DVS Alban successfully diverts a large portion of its waste stream.

Food Waste Diversion Pilot Programs

In 2019, the County designed and launched a pilot food scrap compost program with support from a contractor. The voluntary program has attracted 17 participating groups as of summer 2021 including, the Department of Finance, County Attorney, DVS West Ox, Department of Planning & Development, DPMM, SWMP, Office of Environmental & Energy Coordination, Park Authority, Office of Strategy Management, Kings Park Library, Reston Library, and Board of Supervisor Offices.

Launched by the Fairfax Employees for Environmental Excellence (FEEE), the pilot has diverted thousands of pounds of food waste, engaged with hundreds of staff, and helped develop important operational experience in several settings. In November 2020, the SWMP launched residential food scrap drop-off sites at the I-66 and I-95 facilities. Expansion has continued and as of June 2021, the SWMP opened four additional drop-off locations at farmers markets in partnership with the Park Authority.

FCPS has also operated food waste diversion programs. As of December 2019, 44 schools in FCPS reported having school-based composting programs. Schools with composting programs manage a compost tumbler or pile on site and add compostable items from the

**Vermicomposting
is the use of
earthworms to
convert organic
waste into
fertilizer.**



cafeteria, classrooms, or garden activities. The resulting composted soil is typically used in the school's garden. In addition to outdoor composting programs, 17 schools reported having worm bins in at least one classroom for vermicomposting. See Appendix B for more information.

From 2014 to 2015, Fairfax County's Olde Creek Elementary School conducted a compost collection pilot in partnership with a commercial hauler. Funding of this pilot was made available through an internal grant from the Schoolyard Stewardship Mini Grant program. As part of the pilot, there was weekly collection of two, 14-gallon containers of food waste and other compostables (such as napkins, food-contaminated cardboard, wax paper, etc.) used by a select few classrooms. While the vendor reports indicated a successful program, staff turnover at the school limited the amount of available feedback.

Some FCPS schools choose to go beyond recycling and composting to implement additional school-based food waste reduction programs. As of December 2019, 66 schools reported having food sharing programs in which they collect unopened packaged food and safely store it for donation to local organizations addressing food security in the community.

E-Waste and Toner Cartridges

The County and FCPS's surplus electronics program, which encompassing any item containing a circuit board as well as toner cartridges, offers robust recycling solutions for these materials. The County and FCPS use the same contract for collection and processing which includes refurbishing components for resale and de-manufacturing equipment for recycling. This program delivers information security, environmental performance, and generates revenue.

Batteries, Bulbs, and Hazardous Waste

Batteries, bulbs, used oil, antifreeze, paint, and other chemical wastes are generated through normal operations, and the County and FCPS have diverse management schemes for these universal wastes and hazardous wastes. Much of this material is routed through County contractors. Smaller batteries such as single-use alkaline and rechargeable batteries remain difficult to manage and could be enhanced with centrally coordinated programs. The County's Hazardous Waste Management Program provides consultation and support to County and FCPS efforts on an as-needed basis.

Scrap Metal

Scrap metal is generated during building, remodeling, and demolition projects and through daily operation in building maintenance and fleet services. Scrap metal is collected separately onsite or consolidated at the I-66 or I-95 facilities and is routed to a metal recycling contractor. The County directly measures the amount of scrap metal recycled and receives revenue for these materials.



Yard Waste and Brush

Yard waste, brush, and other landscape waste is generated through daily operations as the County and FCPS manage their grounds. These materials are either left on the lawn, composted, or chipped to create mulch. Yard waste is currently managed separately through County or FCPS staff and contractors and is 100% diverted. Emergency management plans address storm debris and management outside of the Zero Waste Plan. Specific volumes of these materials (by weight or yard) are not currently collected. Due to the multitude of ways this material is managed, exact volumes do not exist and would be a challenge to measure.

Hard-to-Recycle Materials

Some schools choose to participate in alternative disposal programs such as the Trex³ recycling challenge for plastic film or Crayola ColorCycle⁴ for markers and highlighters. Programs like these allow diversion of materials that would otherwise be disposed of with other waste. However, some such programs, including Crayola ColorCycle were halted due to the COVID-19 pandemic. Some challenging materials such as plastic film are ubiquitous in County and FCPS operations. FCPS experience in diverting difficult to manage materials could inform systemwide program development.

There are also efforts to transition away from non-divertable materials. For example, in 2016 FCPS phased out the use of polystyrene food trays in its cafeterias and replaced them with environmentally preferable containers.

Construction and Demolition

Construction and Demolition Debris (C&D) is created through various County and FCPS activities including construction, remodeling, and demolition. C&D waste is managed in various ways through County and FCPS policies and procedures.

- C&D waste managed directly by CAR or dropped off by staff at the County's I-66 and I-95 facilities is currently landfilled. Volumes of C&D waste collected and hauled by CAR are tracked. Opportunities exist for this volume to be diverted and managed through a C&D recycling processor. Given the significant tonnages associated with C&D waste, diversion strategies should be explored as part of Zero Waste efforts.
- The County Green Building Policy⁵, updated September 2020, has a goal for County construction and renovation projects greater than 10,000 square feet to be Gold LEED certified. Waste is a component of LEED certification and is closely tracked. However, this data on volumes and diversion rates does not always get tracked through the County waste data systems.
- County projects smaller than 10,000 square feet and FCPS projects are typically managed through the contractor providing the construction, remodeling, or demolition project. Volumes of C&D waste are not generally reported for tracking and management of the material through landfilling or a C&D recycling processor.



- Data on the amount of C&D material managed, both landfilled and recycled, is not currently tracked for all projects and gaps in volumes and diversion rate information exist. Opportunities for management of C&D waste through Zero Waste, tracking of volumes, and diversion rate tracking exist. C&D waste management should be further explored during the implementation of Zero Waste.

Glass Recycling: The Purple Can Club

In 2019, Fairfax County partnered with three jurisdictions in Northern Virginia to create the Purple Can Club⁶ to divert and recycle glass bottles and jars. Glass is no longer required to be collected in curbside recycling, as it contaminates other recyclables and ends up in landfills after processing. Large purple, glass-only containers are located around the County to collect all colors of glass which go to the I-95 Landfill Complex for recycling.



Although the Purple Can Club is primarily for County residents, the successful management of this program contains lessons for handling hard-to-recycle materials in County government and school operations. Glass collection containers, many of which are located at County facilities, have likely reduced the amount of glass in the County's operational waste stream.

Reduction and Reuse Programs

The County and FCPS have both implemented programs and other efforts aimed at preventing waste at its source. For example, both the County and FCPS have installed hand dryers in many bathrooms (as funding and infrastructure have allowed) and removed paper towels. Similarly, water filters and coolers have been installed in County office kitchens where funded, and bottle filling stations have been installed at several schools. Both entities have further reduced waste by buying cleaning products in bulk, using concentrated chemicals, and/or opting for refillable cleaning product containers to reduce packaging. Also, some County facilities have kitchens stocked with reusable dishes and containers, and some of the kitchens have dishwashers available. Some facilities reuse paper (e.g., old plan sets, memo pads, etc.) as material for art projects.

Staff found that the COVID-19 pandemic facilitated more sustainable practices. For example, virtual learning reduced overall paper usage in schools and teleworking reduced the amount of paper, ink, and overall waste from facilities. The continued use of electronic communications post-pandemic will help maintain the reduced paper use.

The County and FCPS also operate extensive reuse programs to manage excess and surplus property. Surplus property is material that is no longer needed due to factors such as condition, age, cost to repair, changing operational needs, and facility



renovations. The Reuse, Sale, and Recycling program includes items like surplus office supplies, furniture, appliances, equipment and tools, industrial machinery, fleet vehicles, and anything else 'beyond the bin.' The pool of surplus County and FCPS material is first made available via an online shopping portal to staff within both organizations which helps maximize reuse. Items that are not internally reused are offered for sale via public e-auctions before being routed to recycling contractors. In FY 2017, the County redistributed or sold 94% of its excess and surplus property. This notable Zero Waste success also helped generate \$1.5 million in revenue, save thousands in disposal costs, and avoid hundreds of thousands in expenditures of new equipment.

Zero Waste at the Warehouses: The County's Logistics Center and FCPS' Forte Support Center

The Logistics Center is operated by the Department of Procurement and Material Management (DPMM) and serves as the County's central warehouse. It is a 63,000-square-foot warehouse in Springfield – and possibly the County facility with the highest waste diversion rate. DPMM operates the Reuse, Sale, and Recycling program for surplus property while also providing a range of other logistics services to County departments. DPMM transports surplus material to the Logistics Center for processing, delivers items for reuse, conducts online auctions, coordinates recycling programs such as e-waste recycling, facilitates donations to charity, and provides consulting to departments on optimal surplus management. Figure 4 illustrates the different ways that the Logistics Center diverts unwanted items and materials from landfills or incineration, including the recycling of vehicles and large apparatus equipment, books and paper, e-waste, and scrap metal. Through these activities, the Logistics Center achieves a 95% waste diversion rate.



Logistics Center

1.



Redistribution and sale of surplus assets, including vehicles and large apparatus equipment
(In 2019, 4,000 items diverted)

2.



Book and paper recycling
(100 tons annually)

3.



Electronic waste recycling
(In 2019, 40,000 pounds of electronic waste)

4.



Scrap metal recycling
(In 2019, 97,113 pounds of scrap metal)

FIGURE 4: LOGISTICS CENTER

FCPS' Forte Support Center

The Forte Support Center serves as the school system's central warehouse. Operated by the FCPS Office of Procurement Services, the Forte Center provides surplus property management as well as procurement and warehousing services for bulk school supplies. Over 700 different items are purchased in bulk, stocked at the Forte Center, and delivered to the schools as needed. The very nature of the operation reduces waste and cost, but the Forte Center goes further by reusing the shipping containers it receives to repack materials for school delivery. The program has developed its own custom labeling system to ensure efficient and coordinated delivery services.

The FCPS' Forte Center and the County's Logistics Center are leading the way towards a Zero Waste future.



FIGURE 5: FORTE SUPPORT CENTER

Engagement

Fairfax Employees for Environmental Excellence

FEEE is a volunteer network of County staff, hosts outreach programs to educate staff on green initiatives.⁷ Outreach programs include tours of facilities and presentations about existing County sustainability initiatives, workshops on how employees can reduce their own footprint, and action campaigns such as the June 2021 litter pick-up challenge. The FEEE has been active in supporting County recycling initiatives for many years.

Get2Green and School-Based Waste Reduction Efforts

The Get2Green⁸ program is the environmental stewardship program for FCPS. The program supports hands-on environmental education and action for students and staff on sustainability topics including waste reduction, energy conservation, and gardening. Get2Green has a partnership with the National Wildlife Federation (NWF), to support hands-on environmental action through NWF's Eco-Schools-USA program.⁹ The Eco-Schools Consumption and Waste pathway is one of the more popular and accessible pathways for schools getting started on their green journey.

In 2018 and 2019, Get2Green hosted recycling challenges where student-led teams at 29 schools conducted waste stream audits and created action plans to improve their school's waste stream. Teams were then supplied with infrastructure required to implement their plan. Teams that completed these challenges were able to submit their audit and action plan to earn an award through Eco-Schools.

Policies and Regulations

County Government Policies and Regulations

The Fairfax County Code of Ordinances Chapter 109.1¹⁰ governs solid waste management and recycling in the County and requires that recycling systems be provided in non-residential buildings. This provides guidance on minimally accepted materials. As noted above, specific lists of acceptable materials are provided by



contracted MRFs. Various federal and state laws provide guidelines for the management of hazardous and universal wastes.

Public Facilities Manual (PFM).¹¹ The PFM guides the design and development of public facilities. Requirements which affect waste management include internal design characteristics as well as external elements such as dumpster enclosure details.

Standard Operating Procedures (SOPs). Due to the large variety of stakeholders involved in the County and FCPS waste management process, there are no central SOPs. SWMP, Parks, FMD, DPMM, and other stakeholders dictate procedures in areas under their control. This lack of coordination offers an opportunity for improvement.

The Virginia Public Procurement Act¹² (VPPA) and Fairfax County Purchasing Resolution.¹³ These policies outline the requirements and processes the County uses to procure goods and services. Additionally, they identify the County's Purchasing Agent as the entity responsible for the disposal of excess and surplus material.

Environmentally Preferable Purchasing (EPP) Policy. In 2009, Fairfax County adopted the EPP Policy to encourage greener purchasing by County and school staff. The EPP Buyer's Guide¹⁴ recommendations include reducing consumption, purchasing products that are long-lasting, reusable, recyclable, and/or made of recycled materials, and purchasing from vendors that reuse, take back, and/or recycle the products purchased, when feasible. This Policy, however, is aspirational. It does not mandate any specific products or purchasing practices.

The County's Green Building Policy,¹⁵ One Fairfax Policy,¹⁶ and other related County policies. Many County policies have connections to the Zero Waste Plan. For example, the LEED certification system awards points for many waste diversion actions and the One Fairfax Policy commits the county and schools to intentionally considering equity when making policies or delivering programs or services. Waste management practices have many equity considerations from the location of processing facilities to inclusion in business opportunities created by circular economies. The Zero Waste Planning effort will align with all related initiatives to achieve the greatest possible impact.

FCPS Policies and Regulations

Regulation 5030¹⁷

Regulation 5030 establishes guidelines and procedures for the redistribution and disposal of FCPS equipment, furniture, books, and other non-accountable, controlled, and capital assets.

Regulation 8541¹⁸

Regulation 8541 details recycling requirements for all FCPS facilities, including the current processes and accepted items for recycling in schools.

FCPS Policy 8542¹⁹

The FCPS environmental stewardship policy was adopted in 2008 and states FCPS' commitment to reducing the school division's environmental impact.



Virginia Ban on Single-Use Plastics

Executive Order 77, Virginia Leading by Example to Reduce Plastic Pollution and Solid Waste.

Governor Northam of Virginia signed an executive order to phase out and ban single-use plastics. After 120 days from the executive order taking into effect, state agencies and institutions of higher education are required to discontinue the buying and distribution of disposable plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, and single-use plastic water bottles. Exemptions were included for medical/public health and safety uses; however, state agencies are required to create a plan by 2025 to phase out non-medical-use single plastic by 2025. The intent of the executive order is to address the fact that most plastics are not biodegradable and that less than 9% of plastics are recycled properly in the United States.

In early 2021, George Mason University established a Circular Economy and Zero Waste Task Force²⁰ to ensure institutional compliance with Executive Order 77. The state's leadership on this issue should help facilitate the county's transition to Zero Waste.

Overall Diversion Performance

Materials are considered diverted if they are managed through reduction, reuse, or recycling. Materials that are diverted by County and FCPS include mixed paper, cardboard, single-stream recycling, food waste, e-waste, scrap metal, tires, white goods (large electrical appliances including dishwashers, dryers, etc.), yard waste, and brush. Single-stream recycling includes aluminum cans, steel cans, plastic bottles, mixed paper, and cardboard. Materials that go to an incinerator or landfill such as municipal solid waste (MSW), or trash, and C&D are not considered to be diverted material. A baseline diversion rate was developed for the County and FCPS based on a sampling of data as described below. The diversion rate is expressed as a percentage of material based on weight per ton.

Waste generation was reviewed for 2015 to 2020 for the CAR. As noted above, this includes DPWES-SWMP collection services at most County facilities. This material was taken to the County's I-66 and I-95 facilities and weighed, making the data readily available. To calculate diversion rate, brush, mixed paper, cardboard, single-stream, tires, white goods, scrap metal, and yard waste tonnages were totaled together. Tonnage for MSW and C&D, which are incinerated and landfilled, were also totaled. The amount of material diverted was then divided by the total amount of material generated (per ton). The diversion rate for the County has consistently been around 15% for 2015 to 2020 as illustrated in Table 1.

As noted in the sections above, material is also managed outside the CAR collection system. Examples include e-waste and food waste which are picked up at different county locations directly by vendors. Other materials such as scrap metal and C&D are routed both to the County's disposal facilities and routed directly to a contracted



processor. Individual departments coordinate these arrangements depending on their operational needs. In these direct-to-vendor situations, tonnage is only available from county staff or the vendor. The complexity of the County's operations makes it difficult to conduct a complete accounting of total waste generated. Staff attempted this accounting for calendar year 2020, reaching out to vendors and county staff for tonnage reports, and calculated a diversion rate of 27%. The slightly higher number includes the recycling of e-waste, food waste, paper shredding, additional scrap metal and battery and waste oil recycling. Given that CAR tonnages are readily available and reasonably reflect current diversion, the baseline diversion for this Zero Waste Plan will remain as shown in Table 1. See **Appendix A** for the more complete 2020 diversion report. As the County and FCPS work to make and measure progress toward Zero Waste, additional data collection mechanisms need to be established to obtain complete information on diversion performance.

Material	2015	2016	2017	2018	2019	2020
TOTAL DIVERSION RATE	16.3%	14.3%	15.8%	16.3%	14.9%	15.0%

TABLE 1: DIVERSION RATE FOR COUNTY ^A

A: Estimated diversion rate (tons) based on CAR tonnages (2015 to 2020)

FCPS waste generation was provided for FY2017 to the first half of FY2021. FCPS tonnages are reported by their private contractor that manages collection, disposal, and processing of recyclables. Total trash generation and total recycling generation for each fiscal year was calculated. The total tons of recycling were divided by the total tons of trash and recycling generated in tons to create a percentage diversion rate. The diversion rate for FCPS has hovered around 18.5% as illustrated in Table 2.

Fiscal Year	2017	2018	2019	2020	2021
TOTAL DIVERSION RATE	19.5%	18.1%	18.9%	18.6%	21.3%

TABLE 2: FCPS DIVERSION RATE ^B

B: ESTIMATED DIVERSION RATE (TONS) BASED ON FCPS, REPUBLIC SERVICES REPORTED DATA 20 CAR LOCATIONS (FY2017 TO FY2021)

The data available and used to calculate diversion rates covers mostly traditional recyclables instead of materials like scrap metal that is shipped directly to a metal recycler or C&D that is managed by contractors as part of a LEED building project. The diversion rates presented here are the best available data at the time of this Plan. Staff



also attempted a more complete accounting of FCPS total tonnage and were able to document a 24% diversion rate with the addition of available contractor-managed tonnages. See **Appendix A** for more information. Continued work will be done on collecting data and measuring diversion rates.

Trash and Recycling Composition Audits

Understanding the compositions of the trash and recycling streams generated in Fairfax County facilities and FCPS locations is critical to developing a comprehensive picture of the County's solid waste management system. In April 2021, a visual trash and recycling audit was conducted through on-site visits of 20 total locations throughout the County including government administration buildings/offices, public safety buildings, Park Authority sites, public places, public schools, social services buildings, and operations/maintenance facilities. To obtain a visual estimate of the quantity of each material type present, reported by volume (not weight), trash and recycled material samples were removed from their respective dumpsters and sorted at each location.

The following sections give an overview of the trash and recycling audit results for 15 County government facilities and five Fairfax County public schools. The overall averages were weighted based on the number of locations sorted for each county location type. Information obtained during the audits, such as how much divertable material is in the trash stream, how much contamination is in the recycling stream, the volume of different types of material found in both trash and recycling streams, and patterns obtained during all audits were crucial in the development of the recommendations stated in this Plan.

It is important to note that due to the COVID-19 pandemic, most of the buildings were not occupied at full capacity and the results of the audits may not depict what would be seen during normal conditions. In addition, some of the sites used for the waste audit were vaccination hubs; therefore, waste generated did not give an accurate representation of normal operations.

Schools also had several new systems in place to limit person-to-person interaction, including individually pre-packaged lunches. Due to safety concerns, the students were provided with individual paper lunch boxes pre-packaged with multiple beverage and food options. This system generated a high volume of recoverable food waste and packaging in the trash stream. During normal operations, students decide what beverage or meal and sides they would like from a buffet line, which would likely result in a diminished amount of recoverable food waste and reduced need for plastic film packaging.

Material Found in the Trash County

The County facilities analyzed included one administration/office building, three public safety buildings, four parks under the jurisdiction of the Fairfax County Park Authority (FCPA), three public places, two operations/maintenance buildings, and one social



services building. The results (by volume) of the visual waste audits of these County facilities are summarized below in Figure 6. It should be noted that the overall averages were weighted based on the number of County facility locations sorted.

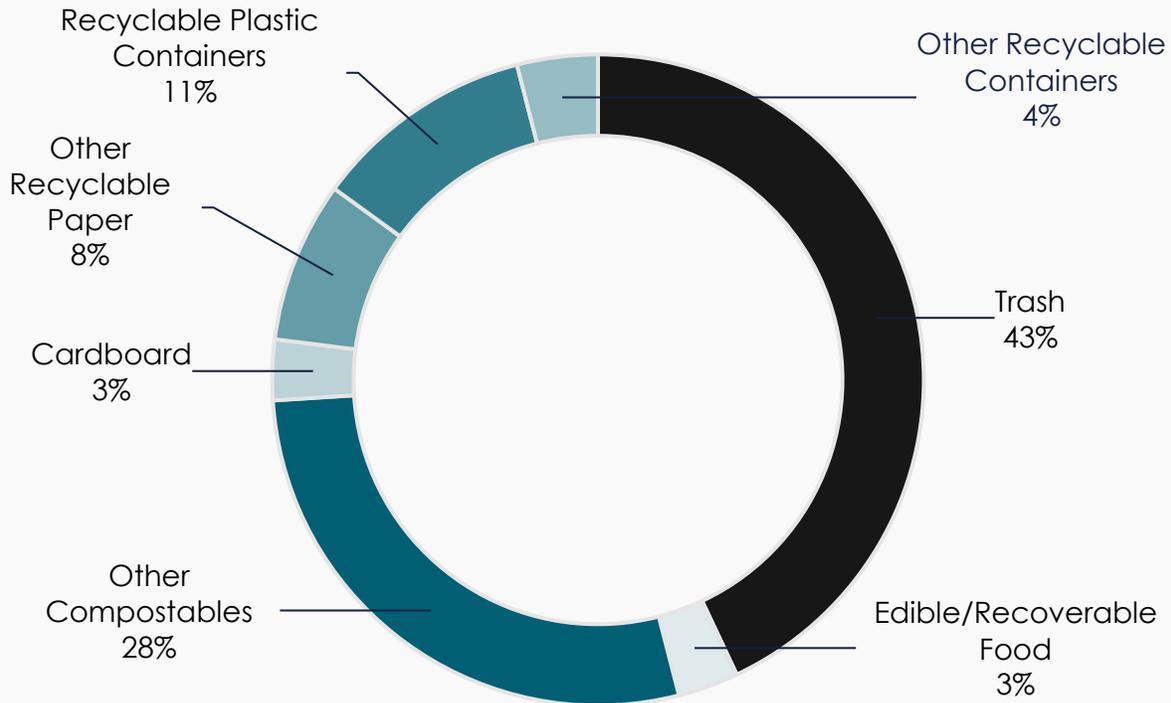


FIGURE 6: TRASH COMPOSITION AUDIT RESULTS FOR COUNTY FACILITY LOCATIONS

By volume, 57% of the materials found in the trash were divertable, including edible/recoverable food, other compostables (e.g., low-grade paper, unrecoverable food waste, etc.), cardboard, other recyclable paper, recyclable plastic containers, and other recyclable containers. The most divertable material found in the County facilities' trash stream was other compostables. The second- and third-most divertable materials were recyclable plastic containers and other recyclable paper, respectively. **Only 43% (by volume) of the entire MSW stream could not be recycled or diverted based on current recycling programs and markets.** Figure 7 summarizes the total percentage of divertable materials found in the trash stream at County facilities, which was 57% (by volume). **Error! Reference source not found.** shows the average divertable materials volume seen in the trash stream at each type of County facility. The results of the County facility audit suggest there could be improvements in diverting recoverable, reusable, and recyclable materials from the trash stream, and ultimately, incineration.

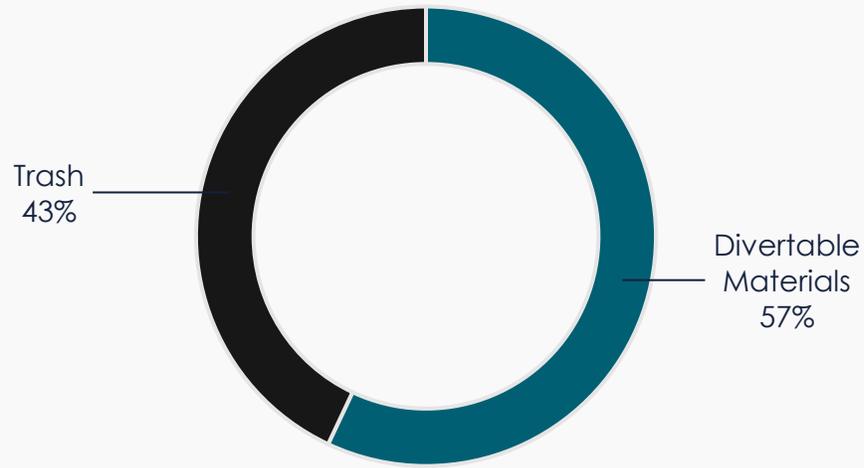


FIGURE 7: COUNTY FACILITIES DIVERTABLE MATERIALS IN TRASH (% BY VOLUME)

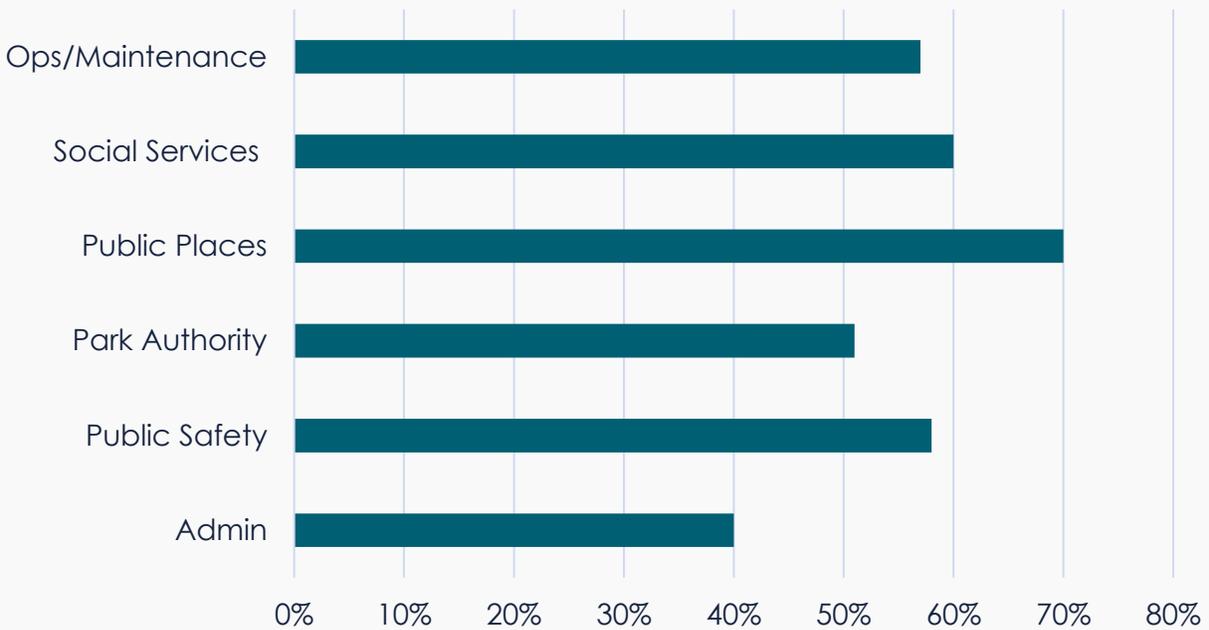


FIGURE 8: COUNTY FACILITY DIVERTABLE MATERIALS IN TRASH, RATE PER FACILITY TYPE (% BY VOLUME)



School

Visual audits of material pulled from the trash were conducted at five Fairfax County schools. The results of the visual audits from the five schools visited are summarized in Figures 9 and 10. The most divertable material found in the FCPS trash stream was other compostable items, which mainly consisted of low-grade paper and unrecoverable food. The second-most divertable material was edible/recoverable food mainly from school lunches. Other recyclable paper was the third-most divertable material.

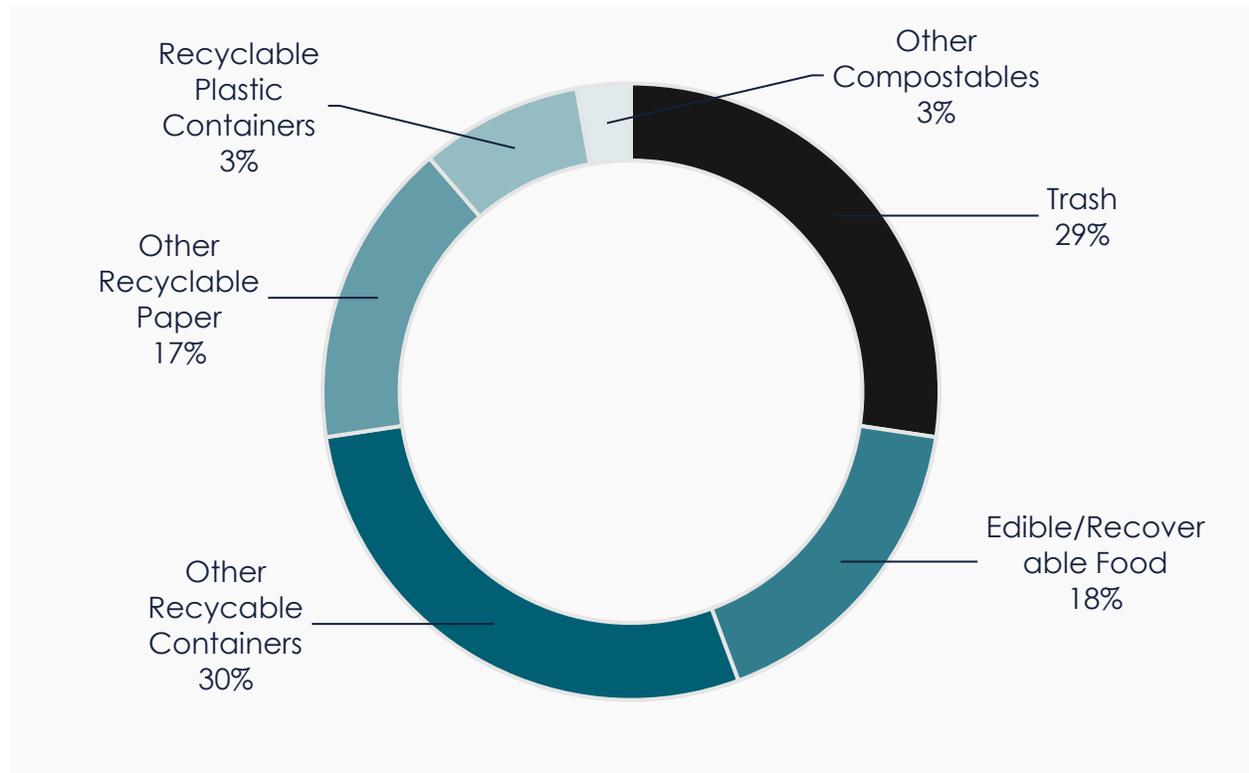


FIGURE 9: TRASH COMPOSITION AUDIT RESULTS FOR SCHOOLS

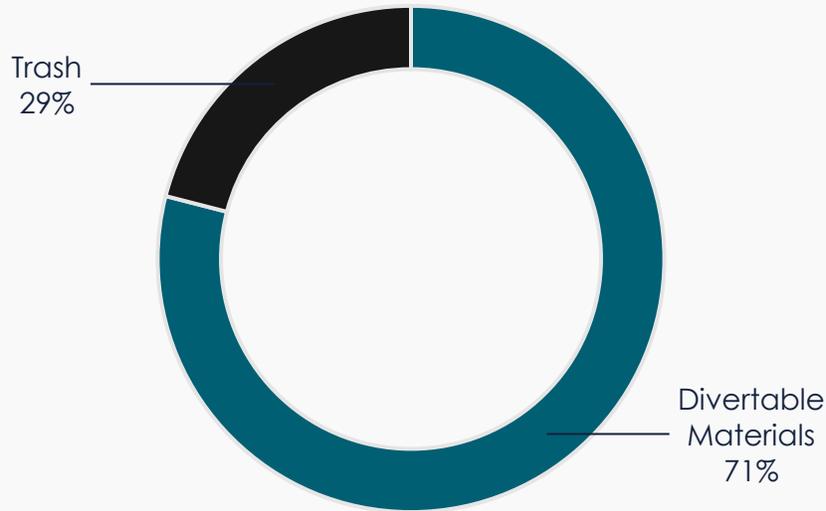


FIGURE 10: SCHOOL DIVERTABLE MATERIALS IN TRASH (% BY VOLUME)

71% of the material in our trash is divertable

Material Found in the Recycling County

Recycling audits were conducted at 12 County government facilities (three of the facilities included in the waste audits were not included in the recycling audits due to either restricted access to the dumpsters or no sample being present due to dumpsters being emptied prior to arrival). The majority (by volume) of recycling was made up of cardboard, followed by non-recyclables, and then other recyclable paper. Some of the main non-recyclables found in the recycling stream were plastic film, Styrofoam, low-grade paper, C&D (e.g., wood and rebar), shredded paper, food waste containers, and single-use plastic service ware. The results (by volume) of the visual recycling audits of these County facilities are summarized below in Figure 11. It should be noted that the overall averages were weighted based on the number of County facility locations sorted. Figure 11 summarizes the weighted average contamination (non-recyclables) rate found in the County facility recycling stream, which was 21% (by volume). Figure 12 shows average recycling contamination rate (by volume) for each County facility type. Results of the recycling audit suggest significant opportunities for improvement. The results of the County facility recycling audit suggest there could be improvements in assuring non-recyclable materials are properly discarded in the trash instead of the recycling stream.

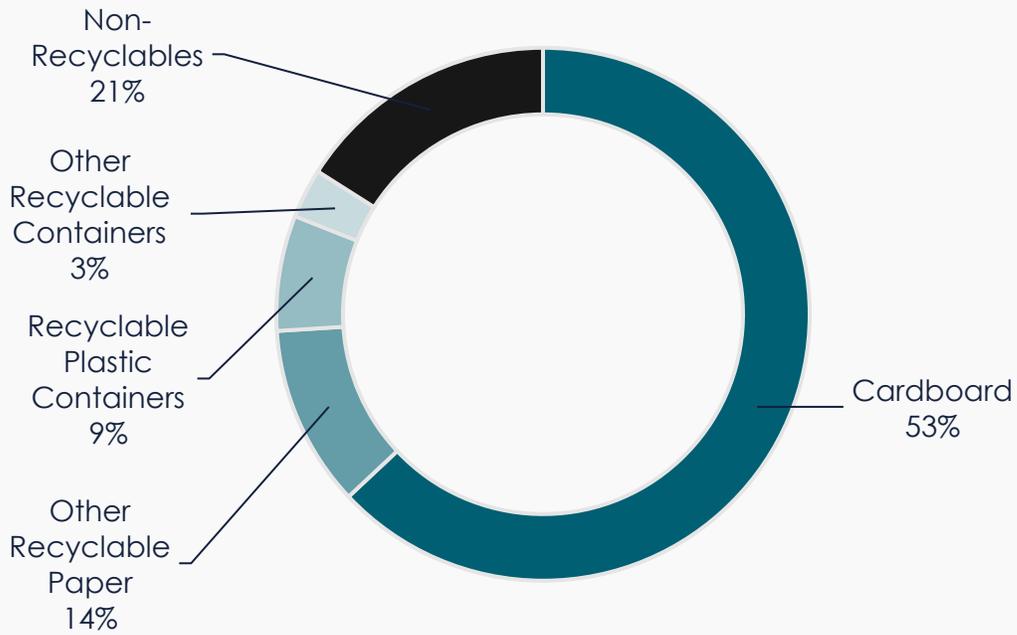


FIGURE 11: RECYCLING COMPOSITION AUDIT RESULTS FOR COUNTY FACILITIES

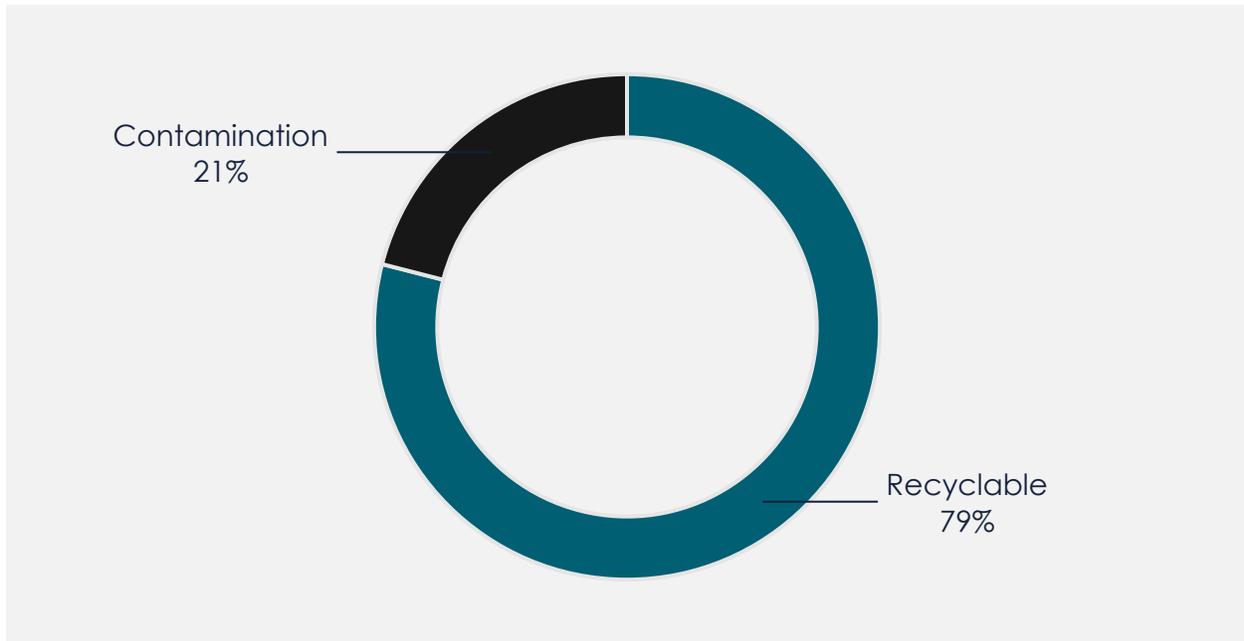


FIGURE 12: COUNTY RECYCLING CONTAMINATION (% BY VOLUME)

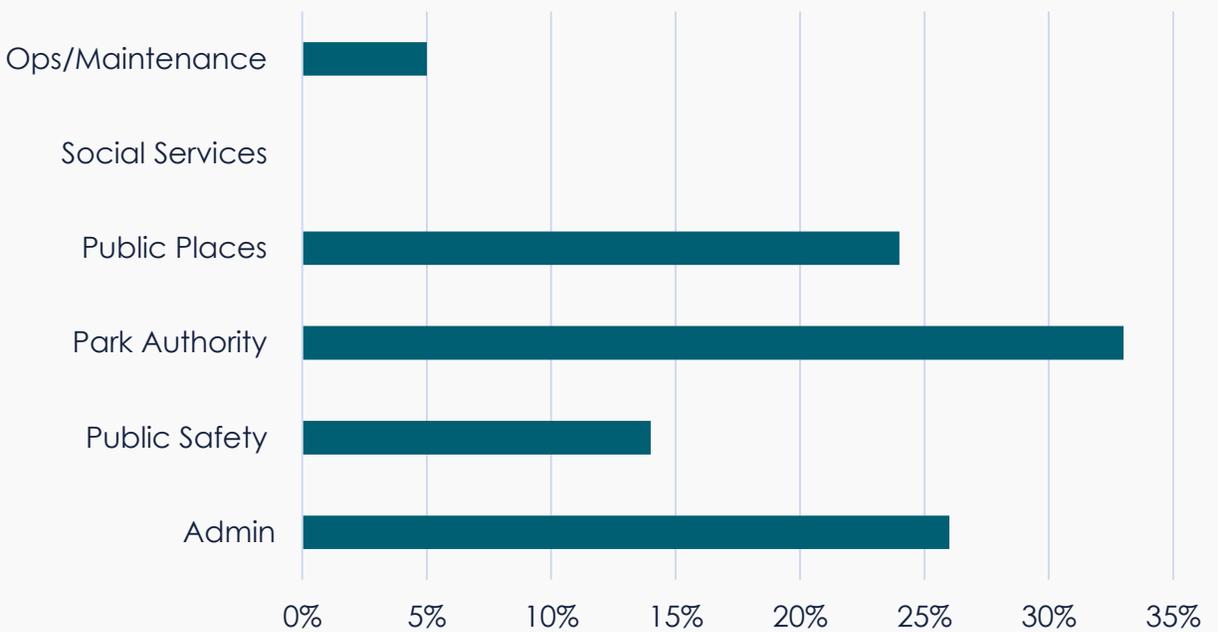


FIGURE 13: RECYCLING AUDIT CONTAMINATION RATE CONTAMINATION RATE RESULTS FOR COUNTY FACILITIES (PER FACILITY TYPE)

School

Recycling audits were conducted at four of the five selected schools and are summarized in Figure 14 (One of the facilities included in the audits was not included in the recycling portion of the audit due to no sample being present due to dumpster being emptied prior to arrival). Very little of the schools' recycling stream (3% by volume) had non-recyclable contamination (as seen in Figure 15). Cardboard was the most prevalent material in the recycling stream at 91% by volume. At the time of the recycling audit, most of the schools were still only at partial capacity due to COVID-19 which could account for the relatively low percentages seen for the other recyclable categories.

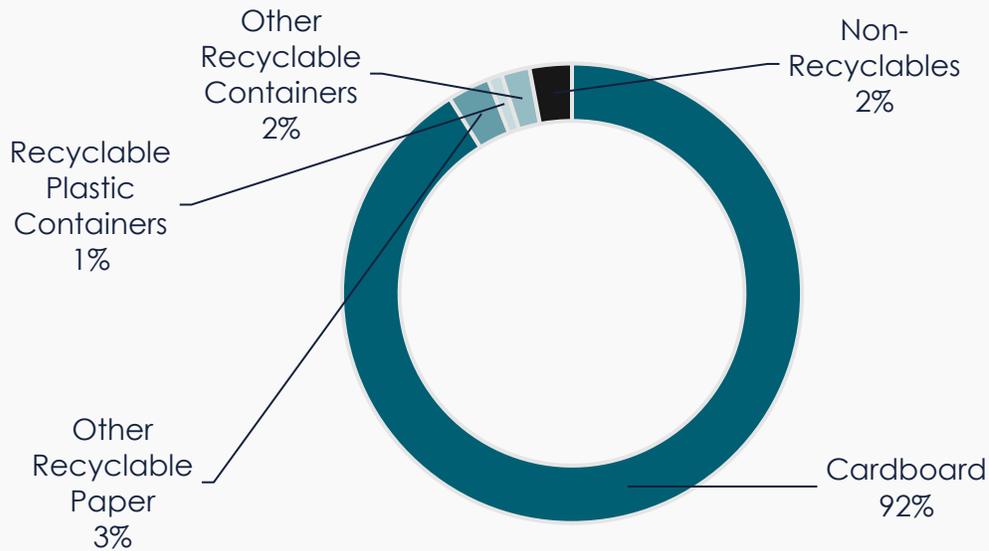


FIGURE 14: RECYCLING COMPOSITION AUDIT RESULTS FOR SCHOOLS

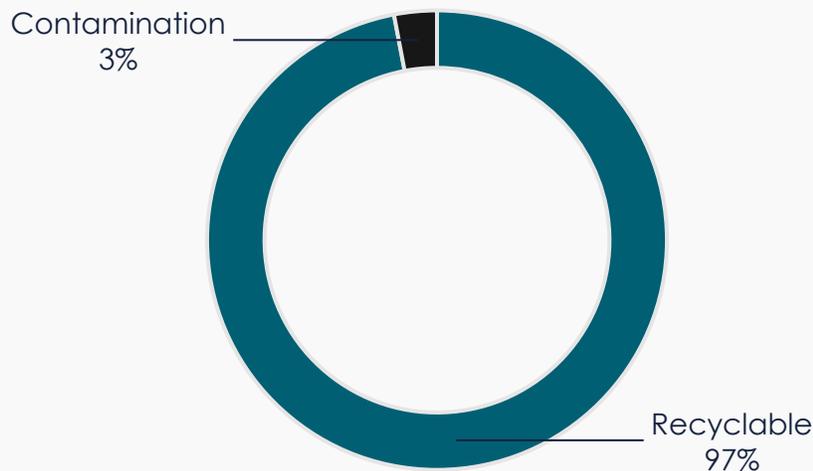


FIGURE 15: SCHOOL RECYCLING CONTAMINATION (% BY VOLUME)

County Facility Organics

While three of the County facilities audited currently participate in Fairfax County's Compost Pilot Program, only one location had a full organics container that could be sorted. Upon sorting, the bin had only 1% contamination (by volume). While a definitive result cannot be gathered from only one bin, staff consistently expressed support for the pilot program. An expansion of the pilot program could potentially generate a greater diversion of organics from landfill disposal.



Waste Audit Summary

The overall results of the trash and recycling audits are discussed below.



FIGURE 16: RECOVERABLE OR DIVERTABLE MATERIALS IN THE TRASH STREAM (% BY VOLUME)



FIGURE 17: CONTAMINATION IN THE RECYCLABLES STREAM (% BY VOLUME)

A summary of the visual trash audit results for all locations, including both the County facility and FCPS locations, is shown in Figure 18. Similarly, a summary of the recycling audit results for both entities is shown in Figure 19. The total amount of divertable material and contamination found in the trash and recycling bins, respectively, can be seen in Figure 1920 and Figure 20. It should be noted that the overall averages were weighted based on the number of locations sorted. Information about the current solid waste management conditions and diversion programs in Fairfax County can be found in the Current Conditions report in [Appendix B](#).

The Waste and Recycling Audit Memo can be found in [Appendix C](#).

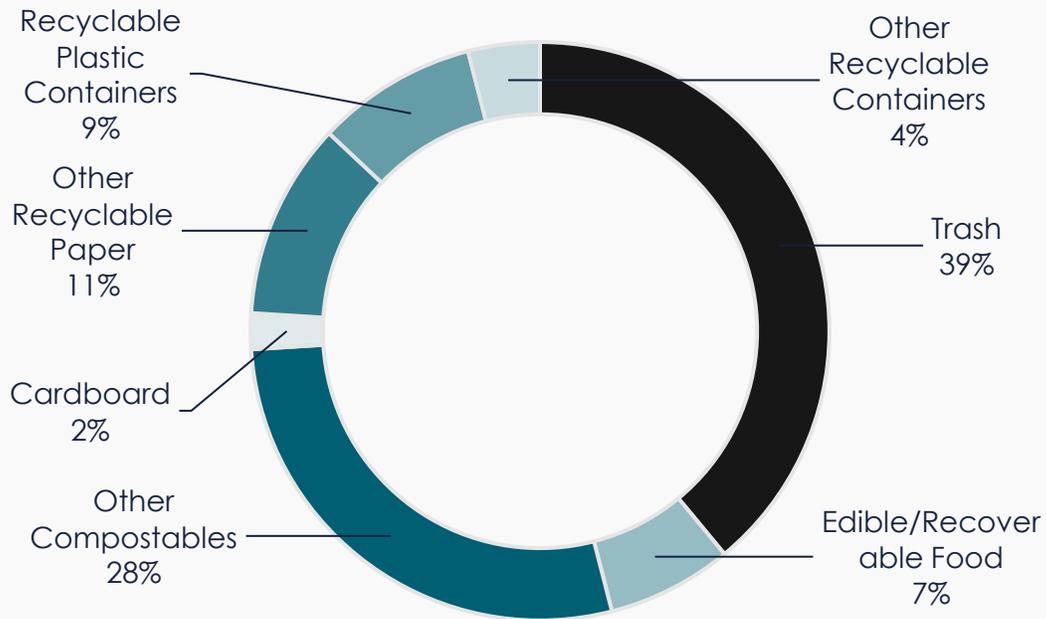


FIGURE 18: OVERALL TRASH AUDIT RESULTS (% BY VOLUME)



FIGURE 19: AVERAGE RECYCLING COMPOSITION AUDIT RESULTS FOR ALL LOCATIONS (% BY VOLUME)

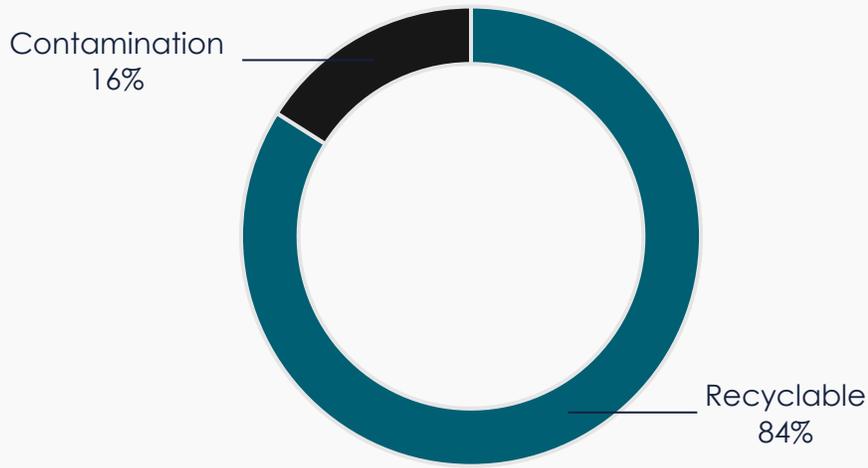


FIGURE 20: OVERALL RECYCLING CONTAMINATION RATES (% BY VOLUME)

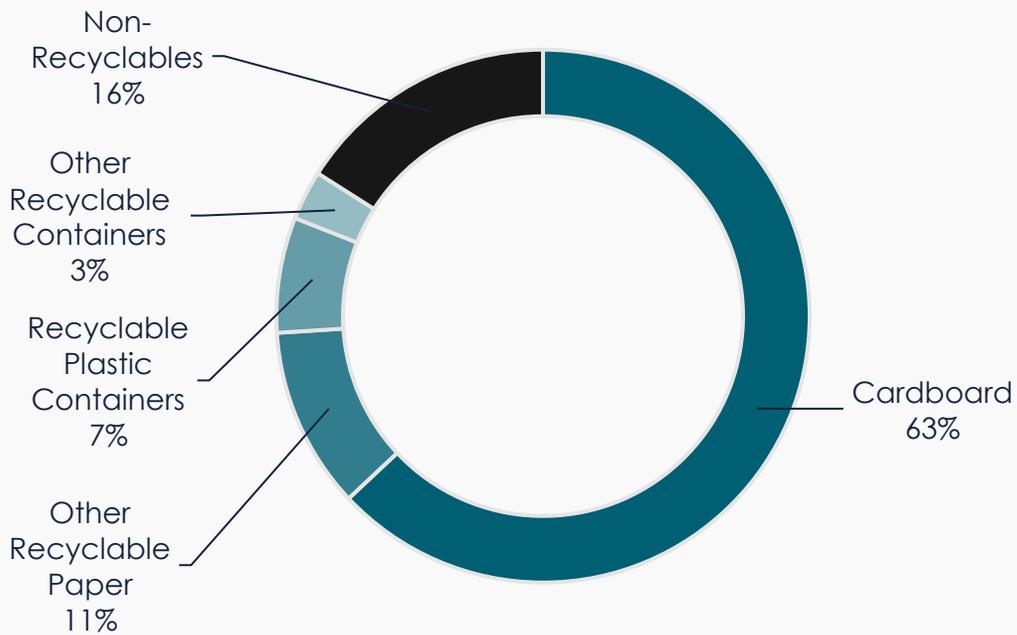


FIGURE 21: AVERAGE RECYCLING COMPOSITION AUDIT RESULTS FOR ALL LOCATIONS (% BY VOLUME)



Employee Survey Results

The SWMP surveyed employees of the County, the school system, the Park Authority, and other municipal facilities to gain input on current conditions (prior to COVID-19 restrictions) throughout Fairfax County municipal buildings and schools as well as ideas for Zero Waste solutions. The survey was launched on May 17, 2021 and was live for about a week. The survey included open-ended questions, and employee responses mirrored many of the Zero Waste strategy recommendations outlined in this Plan. Specifically, employees expressed a desire for increased education and outreach and demonstrated support for a culture change that centers around Zero Waste. Employees wrote about the need for equipment changes and policy implementation and noted these actions as necessary to achieve Zero Waste. The SWMP team evaluated the information to develop strategies to reduce waste, reuse materials, and increase recycling in Fairfax County municipal buildings.

A summary of the survey results is available in the Zero Waste Employee Survey report in [Appendix D](#).

Other Communities' Zero Waste Efforts

The Policies and Regulations section of this report is specific to Fairfax County. However, many jurisdictions in North America have implemented innovative best practices as part of their waste prevention and management programs and services. Recent developments include Extended Producer Responsibility legislation in Maine and Oregon and Break Free from Plastic campaign on a national level. To assist Fairfax County in developing its own Zero Waste Plan, an in-depth evaluation of the Zero Waste Plans of similar communities was conducted.

The communities selected included Montgomery County, Maryland; Vancouver, British Columbia, Canada; Minneapolis, Minnesota; Philadelphia, Pennsylvania; Nashville, Tennessee; and the public school system in New York City, New York.

The following topics and metrics were evaluated for benchmarking and comparison.

- Zero Waste Goals
- Population and Demographic Information
- Waste Generation
- Waste Reduction and Diversion Programs
- Recycling and Diversion Rates
- Waste Composition
- Regulatory Requirements

These communities' Zero Waste Plans, except for Minneapolis, MN, do not focus on waste diversion efforts in public parks. To account for public park programs, case study examples of Zero Waste initiatives and/or waste diversion programs for different jurisdictional parks across the country were analyzed.



The findings of this literature research played a key role in developing Fairfax County's own Zero Waste recommendations and can be found in the Literature Search Report in **Appendix E**.

Strategies

50 Zero Waste Options

To achieve Zero Waste, Fairfax County must change waste generation and disposal behavior through the implementation of a wide variety of programs and policies. Importantly, these goals can only be reached if people understand them and are inspired and empowered by them, highlighting the need for a significant focus on the first "R": Reach Out.

An initial 50 Zero Waste options spanning all 4R's: Reach Out, Reduce, Reuse, and Recycle that could be implemented in Fairfax County facilities (including parks) and FCPS locations were first identified based on the following sources, all of which are described earlier in this document: the County's current Zero-Waste related programs, the results of waste and recycling audits, a review of strategies utilized in other similar jurisdictions and by the Commonwealth of Virginia, and the Fairfax County Zero Waste Employee Survey conducted in May 2021. This list of 50 options can be found in **Appendix F** and is intended to provide a starting point for moving toward Zero Waste. Additional options will likely be brought forth as implementation begins and individual sites are encouraged to be creative in their Zero Waste actions.

24 Strategies

Of the total 50 identified Zero Waste options, 24 strategies were deemed to have the most impact and be suitable (having the highest potential for waste prevention and diversion) and suitable for implementation in Fairfax County facilities and/or FCPS locations. These were selected for more in-depth evaluations, assessing multiple factors including their benefits/impacts, implementation timeframes (short- versus long-term), and estimated cost. The 24 strategies are described in the Essential Strategy section.

To illustrate how these 24 optimal strategies were selected, below are a few examples of how the strategies tie directly to Fairfax County's own waste stream.

- Finding: the majority of current County and FCPS trash could be recycled or composted
 - Strategy 1.3 - Develop Educational Resources, Signage, and Training
 - Strategy 3.2 - Standardize and Increase Receptacles and Signage
 - Strategy 4.3 - Establish Board Directive/Policy for Organics or a Food Disposal Ban
- Finding: there are many opportunities to shrink the County and FCPS waste stream (decrease the total amount of trash, recycling, and composting generated)



- Strategy 2.7 - Launch a Reusable Packaging Program (building on FCPS Forte Support Center's box reuse and custom labeling system)
- Strategy 3.3 - Implement Reusable Food Service Ware
- Strategy 3.4 - Install Additional Air Hand Dryers
- Strategy 4.4 - Establish Board Directive/Policy to Ban Single-use Plastics

The following table includes:

- An explanation of each of the 24 selected strategies
- Where each strategy falls within the essential "4Rs"
- High-level cost brackets:
 - \$\$\$ = \$1 million or greater
 - \$\$ = between \$100,000 and \$1 million
 - \$ = \$100,000 or lower

All Zero Waste options identified are related to the four essential strategies highlighted in this Plan - Reach Out, Reduce, Reuse, and Recycle (the 4 R's) – and categorized into four overarching Zero Waste themes:



Theme 1: Culture: Education and Outreach



Reach out



Reduce



Reuse



Recycle

Cost

1.1 Designate Zero Waste Champions

Designate employees to be Zero Waste Champions to inspire, lead and track Zero Waste or waste diversion efforts. Zero Waste Champions can establish groups of designated individuals to be a part of a “Green Team” that will promote sustainability and Zero Waste practices in schools, offices, and other facilities.

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1.2 Develop Strategies to Recognize, Motivate, and Compensate Staff

Establish strategies such as awards (monetary and/or recognition) for staff going above and beyond to adopt and promote Zero Waste practices.

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1.3 Develop Educational Resources, Signage, and Training

Hold workshops and trainings to teach and promote Zero Waste practices. Resources, such as visuals and marketing campaigns, should be tailored to specific groups to provide training across the four R's.

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1.4 Facilitate Action through Campaigns, Toolkits, and Guides

Utilize the Zero Waste Champions and Green Teams to engage staff members, employees, and students through campaigns, toolkits, and guides.

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Theme 1: Culture: Education and Outreach



Cost

Reach out



Reduce



Reuse



Recycle

1.5 Maximize Opportunities for Student Engagement

Provide opportunities for students to be engaged with Zero Waste through curriculum and other instructional priorities such as service learning and developing Portrait of a Graduate skills.

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Theme 2: Program Establishment



Cost



Reach out



Reduce



Reuse



Recycle

2.1 Establish Zero Waste Team

A Zero Waste Team will require 6 new full-time positions within key County departments and FCPS. The Zero Waste Team will plan and carry out institutional changes, system-wide policies and accountability, training for Zero Waste Champions, and assisting departments with funding needs and strategy implementation.

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2.2 Expand Sustainable Purchasing Program

Guide departments to procure goods and services in alignment with Zero Waste principles such as materials and packaging reduction and reuse, bulk purchasing, product durability and reparability, extended producer responsibility/take-back, recyclability, and prioritizing suppliers that minimize or eliminate waste during manufacturing, integrate recycled content, and support a circular economy.

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Such procurement practices can be enabled by an enforceable sustainable purchasing policy, as well as other mechanisms such as standardized language for solicitations and contracts, Zero Waste specifications for targeted products and services, a Zero Waste purchasing guide, and pledges for agencies and/or key suppliers.



Cost



Reach out



Reduce



Reuse



Recycle

Theme 2: Program Establishment

2.3 Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts

To ensure success of a Zero Waste program, commitment by schools and county departments to participate in the program is critical. Individual agencies will need funding for their Zero Waste efforts.

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2.4 Establish Programmatic Reporting of Activities by County Departments and Schools

Establish a system and protocol for County Departments and Schools to assess and report on their waste generation and Zero Waste goals. Departments and Schools can use this system to report progress made toward Zero Waste and initiate requests for resources needed.

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2.5 Measure Success: Waste Audits, Reporting, Facility Assessments

The Zero Waste Team and other stakeholders must conduct a systemwide waste audit/characterization statistical study every 3 to 5 years to gauge the success of implemented waste diversion options and track progress and milestones. In addition, annual self-assessments and reporting should be required to track overall success.

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Theme 2: Program Establishment



Cost



Reach out



Reduce



Reuse



Recycle

2.6 Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships

Establish or expand current alternate recycling/reuse/recovery programs for all schools and government facilities. Establish more programs to include other recyclable material that is not currently accepted as part of conventional recycling efforts, including construction and demolition debris. Partner with local and/or national businesses, non-profits, and other local governments to help reach Zero Waste goals. Seek out new and innovative solutions within the business community that can help reach Zero Waste.

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2.7 Launch a Reusable Packaging Program

Incentivize reusable packaging systems with key suppliers, including building on FCPS and County warehouses' existing reuse practices.

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2.8 Establish or Expand Edible Food Rescue and Donation Program

Expand food rescue and donation programs at schools and introduce programs to County governments. Unopened food from school cafeterias and government buildings can be donated to food banks and local shelters.

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Theme 3: Facility Upgrades



Cost



Reach out



Reduce



Reuse



Recycle

3.1 Design and Retrofit for Zero Waste

Design and retrofit projects should include consideration and analysis of impact on Zero Waste. Configurations of facilities, including for diversion and waste management activities and addition of Zero Waste stations, should be part of considerations. Loading dock and materials management areas should be designed to accommodate additional space that may be needed for Zero Waste.

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3.2 Standardize and Increase Waste Receptacles and Signage

Reduce contamination and increase diversion in overall materials stream through improved infrastructure. This includes adding recycling bins, composting bins, and exterior dumpsters and using strategic coloring and placement of signage and bins. Standardize containers and signage throughout the County for consistent user experience. Design for Zero Waste so that existing bins can be used as long as possible. Signage should be designed for customization depending on each department or school's waste composition.

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Theme 3: Facility Upgrades



Cost



Reach out



Reduce



Reuse



Recycle

3.3 Implement Reusable Food Service Ware

Implement the use of reusable service ware in school kitchens, cafeterias, and staff kitchens to reduce or entirely remove the amount of single-use service ware purchased and disposed of. Adding or installing dishwashers where practical to County facility and/or school kitchens will promote the use of reusable service ware and dishware, instead of single-use materials. Long-term cost savings may be significant.

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3.4 Install Additional Air Hand Dryers

Air hand dryers are more sustainable compared to paper towels in bathroom facilities. Long-term cost savings may be significant.

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3.5 Install Additional Bottle Filling Stations

Install more automatic, filtered bottle filling stations in County facilities and schools to encourage the use of reusable water bottles in lieu of single-use plastic water bottles.

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Theme 4: Policy Implementation /Board Directives



Cost



Reach out

Reduce



Reuse



Recycle

4.1 Establish a Zero Waste Policy

Establish an overarching Zero Waste Policy encompassing a myriad of Zero Waste initiatives/programs/goals for Fairfax County departments and schools to follow. Sub-regulations/policies under the Zero Waste Policy umbrella could be created or updated as needed. Examples may include requiring departments and schools to report diversion rates as a tracking method and to gauge the progress of the programs and requiring facilities to have accessibility to available and proper avenues for waste, recycling, and composting.

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4.2 Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals

Establish funding, through internal reallocation of funds and/or external receipt of grants, to help fund Zero Waste programs. Initial costs should include six new full-time positions and further resources needed in the long term.

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Theme 4: Policy Implementation /Board Directives



Cost



Reach out

Reduce



Reuse



Recycle

4.3 Establish Board Directive/Policy for Organics or a Food Disposal Ban

Establish directives/policies that divert organics and food waste away from incinerators/landfills into composting facilities. At a minimum set certain limits for disposal of organics as trash. Make food waste diversion accessible throughout government and schools.

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4.4 Establish Board Directive/Policy to Ban Single-use Plastics

Establish Board Directive/Policy to enact a ban on single-use plastics in school and government facilities.

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4.5 Support Legislative Actions at The State and Federal Levels

Support legislation or amendment of existing legislation such as Extended Producer Responsibility (EPR), material bans, etc. to promote and facilitate the County's Zero Waste goals.

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Theme 4: Policy Implementation /Board Directives



Cost



Reach out



Reduce



Reuse



Recycle

4.6 Use Events as a Catalyst to Minimize or Eliminate Waste

Expand the Zero Waste infrastructure (e.g., provide reuse opportunities, more recycling bins, and organics collection) at mass gatherings and events. Examples include adding Zero Waste requirements to county facility or park rentals, providing guides or easier access to infrastructure for event planners, or conducting outreach at existing events to demonstrate Zero Waste in action.

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Implementation Schedule

For each option, the implementation timing was reviewed and determined based on efforts anticipated as well as interdependency on other options, where applicable.

Because the specific year(s) in which an option may be implemented could vary, implementation timing has been characterized in general terms of short-term (2022 - 2024), medium-term (2025-2027) or long-term (2028- 2030).

Schedules outlining the proposed timeframe of each tiered option, based on whether it is anticipated to be short-term, medium-term or long-term, as well as the potential specific years of implementation and/or estimated milestone completion dates (in percentages) is shown in the tables below.

The schedule should be used for planning purposes only. Timelines are estimates only and are contingent on many factors such as staffing and funding. See the “How We Will Achieve Zero Waste” section for more details.



Theme 1: Culture: Education and Outreach	SHORT-TERM 2022-2024	MEDIUM-TERM 2025-2027	LONG-TERM 2028-2030
Designate Zero Waste Champions			
Develop Strategies to Recognize, Motivate, and Compensate Staff			
Develop Educational Resources, Signage, and Training			
Facilitate Action through Campaigns, Toolkits and Guides			
Maximize Opportunities for Student Engagement			



Theme 2: Program Establishment	SHORT-TERM 2022-2024	MEDIUM-TERM 2025-2027	LONG-TERM 2028-2030
Establish Zero Waste Team	█		
Establish Sustainable Purchasing Program	█	█	
Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts	█		
Establish Programmatic Reporting of Activities by County Departments and Schools	█		
Measure Success: Waste Audits, Reporting, Facility Assessments	█	█	█
Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	█	█	█
Launch a Reusable Packaging Program	█		
Establish or Expand Edible Food Rescue and Donation Program	█	█	



Theme 3: Facility Upgrades	SHORT-TERM 2022-2024	MEDIUM-TERM 2025-2027	LONG-TERM 2028-2030
Design and Retrofit for Zero Waste			
Standardize and Increase Waste Receptacles and Signage			
Implement Reusable Food Service Ware			
Install Additional Air Hand Dryers			
Install Additional Bottle Filling Stations			



Theme 4: Policy Implementation / Board Directives	SHORT-TERM 2022-2024	MEDIUM-TERM 2025-2027	LONG-TERM 2028-2030
Establish a Zero Waste Policy			
Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals			
Establish Board Directive/Policy for Organics or a Food Disposal Ban			
Establish Board Directive/Policy to Ban Single-use Plastics			
Support Legislative Actions at The State and Federal Levels			
Use Events as a Catalyst to Minimize or Eliminate Waste			



Health, Safety, and Zero Waste

The COVID-19 pandemic impacted the waste stream generated at County and FCPS facilities due to various operational changes. For example, the number of employees and students on site decreased, and the number of visitors to outdoor facilities such as parks increased. Facility usage also changed with the pandemic where vaccine clinics or testing centers were placed in buildings that are not traditionally utilized for healthcare. Usage of pandemic-related materials such as personal protective equipment (PPE), hand sanitizers, and cleaning materials and the associated disposal requirements increased. Sanitation concerns also resulted in the suspension of some recycling programs. Food management changed dramatically as well. For example, single-serve packages became the norm to minimize the handling of materials.

Health and safety must always remain a top priority. Fortunately, Zero Waste and health and safety can work together: there are often opportunities to minimize waste while still taking effective precautions. For example, in the context of COVID-19 some Personal Protective Equipment (PPE) such as face coverings may be single-use, reusable, or potentially recyclable. Hand sanitizer can be purchased in large containers and used to refill user-friendly pump bottles. And many other reusable products may be as safe as their single-use counterparts when cleaned and handled safely.

Ultimately, before any Zero Waste strategy is implemented, it must meet or exceed health and safety needs and guidelines. This Zero Waste journey must fully align with slowing or stopping the spread of COVID-19, including by being flexible to evolving federal, state, and local recommendations as the “new normal” is established. **As such, Fairfax County can continue to be a statewide and regional leader in both the management of this health emergency and in environmental protection and innovation.**

How We Will Achieve Zero Waste

Achieving Zero Waste by 2030 is no small task. It will require participation from just about every employee, student, and user of government and school facilities, as well as County and FCPS leadership and business partners. For Fairfax County's complex and diverse operations to reach this goal, building a strong, foundational implementation structure and network is essential.

Levels of Involvement

Below is a list of recommended key levels of involvement across the County government and schools.

- Leadership: A Tone from the Top
 - Ongoing commitment from Board of Supervisors, School Board, executives, and directors to provide the foundation for Zero Waste efforts.



- Central Coordination and Zero Waste Team
 - Full-time staff within the County and FCPS dedicated to centrally coordinating Plan implementation among all involved.
 - Zero Waste Team comprised of key departments to plan and carry out institutional changes, system-wide policies and accountability, training for Zero Waste Champions, education, and assisting departments with funding needs and strategy implementation.
- Departments and Individual Schools
 - Departments and schools take on responsibility of facilitating local participation in Zero Waste implementation and identify a Zero Waste Champion(s).
 - Zero Waste Champions will be defined as those primarily responsible for cultural changes, such as educating and motivating colleagues and students, coordinating action in their facility/ies, and helping to measure progress.
- Everyone
 - **Every employee, student, business partner, and user of government and school facilities has a role to play in rethinking their own consumption and waste-related habits, and in helping create a Zero Waste County and schools.**



Required Resources

Implementing the Zero Waste Plan can only be successful with adequate resources. Implementation will require significant staff time and financial resources, both for central coordination and for carrying out strategies across departments, facilities, and schools such as establishing programs and upgrading facilities. Similarly, assistance from contractors will likely be necessary for specialized tasks such as conducting periodic waste audits. Furthermore, additional funding will be needed for various diversion programs, infrastructure, equipment, and other products, such as electric hand dryers,

Supporting individual departments and schools in obtaining funding for their various Zero Waste efforts is crucial to success.

compost bins, and reusable service ware. While many of these changes may save money in the long run, such upfront and ongoing program maintenance investments will need to be made.

As of September 2021, one full time position, a county coordinator, has been added to the Carryover package for Board consideration in October 2021. Funding for the additional needs, including an FCPS coordinator has not yet been identified.

The section below includes a funding plan framework.

Ensuring and Measuring Progress

As shown throughout this Plan, Zero Waste can only be achieved with participation from every corner of County government and school operations. Therefore, a successful implementation must include mechanisms to motivate, celebrate, and recognize the great performance of departments, schools, and individuals, as well as mechanisms to ensure all take responsibility and accountability for doing their part.

It is recommended that a regular assessment and reporting process be implemented for all departments and schools to partake. The annual Equity Impact Plans and associated reporting which all County departments currently complete serve as an example. For Zero Waste, this will include a regular process.

Annual

With support and feedback from the Zero Waste Team, every department and school will:

- Conduct self-assessments of waste reduction, diversion, and disposal practices within each department and school
- Set goals and request funding for Zero Waste strategies most appropriate to their operations
- Report to Zero Waste Team on progress made



Every Three Years

Conducting periodic system-wide waste and recycling audits as described in the Strategies section will measure overall progress toward meeting the Zero Waste goals.

System-wide audits will be conducted in 2024, 2027, and 2030.

The Zero Waste Team recommends creating a website to share annual highlights as well as overall progress.

Short-Term Priorities for 2022

To build capacity and begin planning the development of major strategies right away, the first year of implementation will prioritize:

- Establishing structure: Coordinators, Core Zero Waste Team, and Zero Waste Champions
- Developing onboarding resources and reporting and accountability mechanisms
- Conducting initial department and school outreach
- Establishing funding needs and mechanisms
- Implementing select short-term strategies



FIGURE 22: ORGANIZATION-WIDE FOCUS ON ZERO WASTE



Commencement

While this Plan marks an important milestone in Fairfax County's Zero Waste journey, this journey has been underway for years. Government and school operations have built a strong foundation for achieving Zero Waste as demonstrated by the waste diversion and reduction programs in the Where We Are Now section.

Successful implementation of this Plan will depend on changing thoughts, behaviors, and attitudes related to consumption and waste. The four essential strategies - Reach Out, Reduce, Reuse, and Recycle (the 4Rs) - are key drivers to achieve this goal, especially as the County and FCPS shift to an approach prioritizing upstream waste reduction rather than downstream waste management. The focus on engaging staff, students, and facility users will help lead the way in achieving Zero Waste.

The assessments of Where We Are Now and Where Others Are Now, and the waste audits conducted during the development of this Plan emphasized the opportunity for improvement in waste reduction. The size and complexity of Fairfax County's government and school operations present substantial challenges in changing current practices around waste. The strategies and actions recommended in this Plan will require significant financial investment and the dedication of all facility users to succeed. However, overcoming these challenges will bring meaningful long-term environmental, economic, and societal benefits.

**Now that we have the roadmap
to achieve Zero Waste, let's roll
up our sleeves and get started.
There's Zero time to Waste!**



-
- ¹ Adapted from the State of Connecticut: [Zero Waste \(ct.gov\)](#)
 - ² Zero Waste International Alliance, Policies & Standards: <https://zwia.org/policies/>
 - ³ <https://recycle.trex.com/>
 - ⁴ <https://www.crayola.com/colorcycle>
 - ⁵ <https://www.fairfaxcounty.gov/environment-energy-coordination/green-building#:~:text=About%20Green%20Building%20In%20Fairfax%20County&text=In%202008%2C%20all%20projects%20greater,achieve%20a%20LEED%20Certified%20rating.>
 - ⁶ <https://www.fairfaxcounty.gov/publicworks/news/regional-approach-glass-recycling-leads-creation-purple-can-club>
 - ⁷ <https://www.fairfaxcounty.gov/environment-energy-coordination/employees>
 - ⁸ <http://get2green.fcps.edu/index.html>
 - ⁹ <https://www.nwf.org/eco-schools-usa>
 - ¹⁰ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/chapter-1091-solid-waste-management>
 - ¹¹ <https://online.encodeplus.com/regs/fairfaxcounty-va-pfm/index.aspx>
 - ¹² <https://law.lis.virginia.gov/vacodepopularnames/virginia-public-procurement-act/>
 - ¹³ [https://www.fairfaxcounty.gov/procurement/sites/procurement/files/assets/documents/fairfax%20county%20purchasing%20resolution%20\(2020\)%20-%20final.pdf](https://www.fairfaxcounty.gov/procurement/sites/procurement/files/assets/documents/fairfax%20county%20purchasing%20resolution%20(2020)%20-%20final.pdf)
 - ¹⁴ <https://www.fairfaxcounty.gov/energy/sites/energy/files/assets/documents/epp%20buyers%20guide%20-%20external%202018-1-31.pdf>
 - ¹⁵ <https://www.fairfaxcounty.gov/environment-energy-coordination/green-building>
 - ¹⁶ <https://www.fairfaxcounty.gov/topics/sites/topics/files/assets/documents/pdf/one-fairfax-policy.pdf>
 - ¹⁷ https://insys.fcps.edu/schoolboardapps/report_policy/cache/numeric-5000.htm
 - ¹⁸ [https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/BAPT466358BA/\\$file/R8541%20.pdf](https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/BAPT466358BA/$file/R8541%20.pdf)
 - ¹⁹ https://insys.fcps.edu/schoolboardapps/report_policy/cache/numeric-all.htm
 - ²⁰ [Circular Economy and Zero Waste Task Force – Sustainability Council \(gmu.edu\)](#)

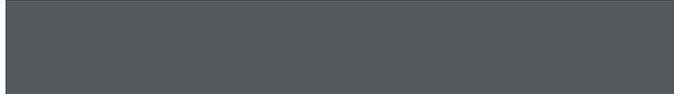
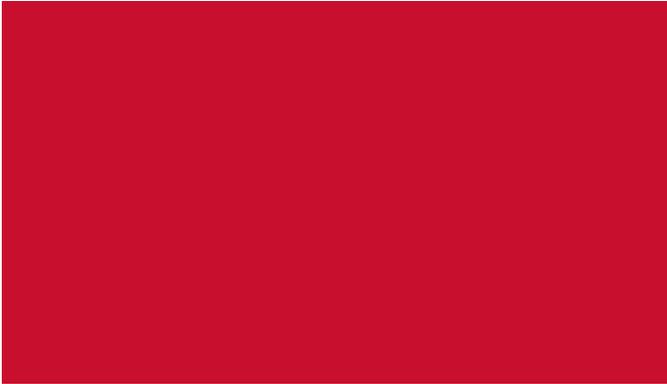


Appendix A

2020 Diversion Rates Update

Zero Waste Plan Development

Fairfax, VA
September 13, 2021





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During Fairfax County’s review of diversion rates, it was noted that material is also managed outside the County Agency Route (CAR) and FCPS’s trash/recycling collection system. Examples include e-waste and food waste which are picked up at different county locations directly by vendors. Other materials such as scrap metal and Construction & Demolition Debris (C&D) are routed both to the County’s disposal facilities and routed directly to a contracted processor. Individual facilities coordinate these arrangements depending on their operational needs. In these direct-to-vendor situations, tonnage is only available from staff or the vendor. The complexity of the County’s operations makes it difficult to conduct a complete accounting of total waste generated.

Fairfax County Staff attempted this accounting for calendar year 2020, reaching out to vendors and staff for tonnage reports. Fairfax County was able to get additional 2020 tonnage data from its contractors as well as extract more complete data from Fairfax County’s own internal tracking system. The Fairfax County diversion rate increased from 15% to 27% for 2020, and the Fairfax County Public Schools (FCPS) diversion rate increase from 21.3% to 24% for 2020.

The waste generation data used in the Zero Waste Plan provides a reasonable estimate of diversion and has not been updated. Additional steps should be taken by Fairfax County and FCPS to collect this information on an ongoing basis and work to identify other missing data points that should be tracked in an alternative manner.

The comprehensive data update completed for 2020 is in Table 1.

Table 1: 2020 Cumulative Tonnages (Recalculated)

Material	County	FCPS	Waste Diverted From Incinerator/ Landfill?
Trash (MSW)	6,084	10,859 ^a	No
Commingled Recyclables (Single Stream)	501	2,677 ^a	Yes
Mixed Paper	70	N/A ^b	Yes
Cardboard (OCC)	55	N/A ^b	Yes
Construction and Demolition (C&D)	311	11	No, see notes
Yard Waste (all types)	632	378	Yes, see notes
Scrap Metal ^a	341	109	Yes
Tires (end of life)	203	1	Yes
Tires (retreaded) ^a	75	0	Yes
Food Waste Composting ^a	2	N/A ^c	Yes
E-waste ^a	77	125	Yes
Shredded Paper ^a	233	51	Yes
Automotive Fluid Recycling (waste oil, etc) ^a	78	52	Yes
Automotive Battery Recycling ^a	81	54	Yes
TOTAL	8,743	14,316	
TOTAL DIVERTED	2,348	3,447	
DIVERSION RATE (%)	27%	24%	

^a Data provided by contractors or estimated by consumption, procurement or other information available

^b Material included in Commingled (single stream)

^c Not able to calculate tonnage with available data

Notes and Context:

- Tonnage from end-of-life tires and retreaded tires are assigned only to the County due to data tracking methods. Tire retreading occurs on limited tires only and the weight is estimated from a total of 1,874 tires retreaded.
- Operational waste generated by the Noman Cole Pollution Treatment Center (wastewater processing) is not included. In 2020, this included around 2,000 tons of ash and 700 tons of screened solids which were not diverted from incineration/landfill.
- Tonnage from surplus fleet vehicle sales (by a contracted auctioneer) is not included. With a fleet size in the thousands, there are hundreds of surplus vehicles that reach replacement criteria and are sold annually. The weight from this reuse activity is likely over 1,000 tons.
- Tonnage from internal reuse and public sale of surplus material (anything from furniture to equipment) is not included. With thousands of items reused or sold, the weight of such diversion activities would likely be in the hundreds of tons.
- C&D and yard waste are also likely significant tonnages and are not fully included. Tonnages represented in the table are only from material routed to the County's I-66 and I-95 facilities. C&D waste managed by the County is not currently diverted. Collaboration with the many contractors providing C&D waste management services should be prioritized given its diversion potential.



Appendix B

Detailed Diversion Performance and Current Conditions Assessment

Zero Waste Plan Development

Fairfax County, VA
September 14, 2021



Table of Contents

1	Introduction	4
2	Diversion Performance (Tonnages)	4
2.1	County Waste Generation.....	4
2.2	Schools Waste Generation	6
3	County and FCPS Waste Management Services and Facilities	9
3.1	Solid Waste Services	10
3.1.1	Collection and Hauling at County Facilities.....	10
3.1.2	Collection and Hauling at FCPS.....	11
3.1.3	Food Waste Diversion Pilot Programs – Participating Locations	12
3.2	County-Owned Waste Management Facilities	13
3.2.1	I-66 Transfer Station.....	13
3.2.2	I-95 Landfill Complex.....	15
3.2.3	Newington Collections Operations Facility.....	16
3.2.4	Logistics Center Complex	16
4	Legislation and Regulations	17
5	Funding & Financial Information.....	19
5.1	Program Funding	19
5.1.1	Leaf Collection, Fund 40130	19
5.1.2	Refuse Collection and Recycling Operations, Fund 40140	20
5.1.3	Refuse Disposal, Fund 40150	20
5.1.4	I-95 Refuse Disposal, Fund 40170.....	20
5.1.5	School Funding.....	21
5.2	Capital Improvement Program Budget	21
6	Contract Review	23
6.1	County Facilities.....	23
6.2	Schools.....	23
6.2.1	Waste.....	23
6.2.2	Recycling	24
7	Summary.....	25

Tables

Table 2.1 CAR Net Tons per Year	5
Table 2.2 FCPS Waste Generation	7
Table 2.3. FCPS Recycling Generation.....	8
Table 2.4. FCPS Total Waste & Recycling Annual Generation and Composition	9
Table 4.1 Federal laws and Regulations Governing Solid Waste Management.....	17
Table 4.2 State Laws and Regulations Governing Solid Waste.....	18
Table 5.1 Commercial Tipping Fees FY21	20
Table 5.2 Fairfax County Solid Waste FY21 Capital Improvement Projects.....	21
Table 6.1 Bates Trucking Commercial Disposal Rates	23
Table 6.2. Republic Services FCPS Waste Collection Costs.....	24
Table 6.3 Republic Services FCPS Recycling Collection Costs	25

Figures

Figure 2-1. CAR Annual Tonnage Percent (%) Composition (by weight)	6
Figure 2-2. FCPS Waste Generation (FY17-FY20).....	7
Figure 2-3. FCPS Recycling Generation (FY17-FY20)	8
Figure 3-1. Waste Pick-Up by County Services	10
Figure 3-2. I-66 Facility Layout	14
Figure 3-3. I-95 Facility Layout	15

ACRONYMS AND ABBREVIATIONS

CAR	County Agency Route
C&D	Construction and Demolition Debris
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CIP	Capital Improvement Program
CY	Cubic Yard
DPMM	Department of Purchasing and Materials Management
DVS	Department of Vehicle Services
E/RRF	(I-95) Energy/Resource Recovery Facility
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
FEEE	Fairfax Employees for Environmental Excellence
FMD	Facilities Management Department
FY	Fiscal Year
JET	Joint Environmental Task Force
MRF	Materials Recovery Facility
MSW	Municipal Solid Waste
OCC	Old Corrugated Cardboard
RCRA	Resource Conservation and Recovery Act
SOP	Sorted Office Paper
SWMP	Fairfax County's Solid Waste Management Program

1 Introduction

HDR has been retained by Fairfax County for the development of a Zero Waste Plan. The Current Conditions is part of a series of Interim Task reports developed in support of the project.

The purpose of this report is to conduct an in-depth analysis of the current Fairfax County facility and public-school metrics concerning waste generation, diversion programs, collection services, and disposal or recycling services, and the regulations, funding and contracts that drive them. As a way of understanding the current composition of the materials generated and establish a baseline of existing practices, visual waste and recycling audits were performed at 20 locations that were a mixture of County facilities and public schools. The results of these audits are included separately in Appendix C.

2 Diversion Performance (Tonnages)

The following tables provide waste generation data for the County and Fairfax County Public Schools (FCPS).

2.1 County Waste Generation

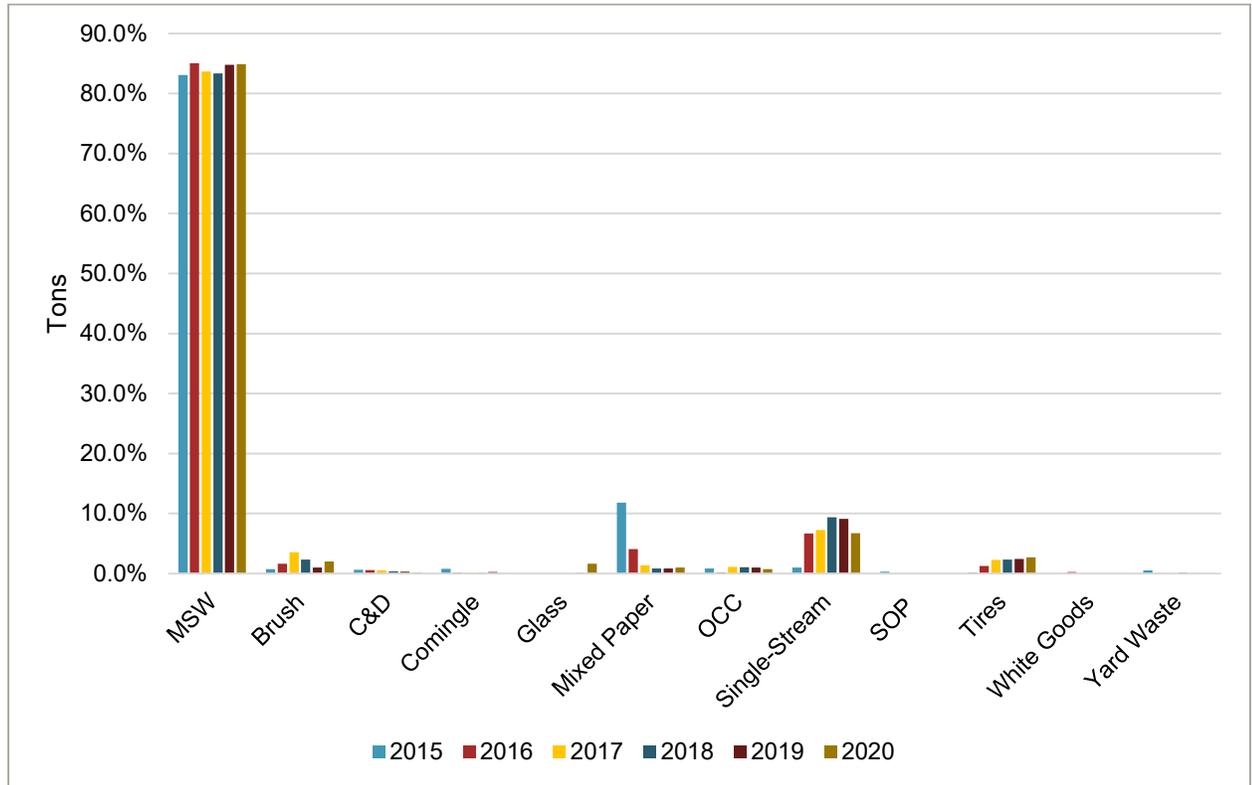
Table 2.1 provides the annual tonnages of material collected from the County Agency Route (CAR) for the years 2015 to 2020. The CAR route provides waste collection services to the majority of County facilities but is not inclusive of all operational waste generated. Figure 2-1 shows the composition of each material type year over year. Operational waste generation is relatively stable. Changes in the tonnages from year to year may be the result of a number of factors including routing material directly to contractors for processing, inconsistent tracking or other factors. Fairfax County's Zero Waste efforts should prioritize the development of consistent data tracking to consistently monitor progress.

Table 2.1 CAR Net Tons per Year¹

Material	2015	2016	2017	2018	2019	2020
MSW	2,261	5,431	8,838	8,922	8,730	6,294
Brush	20	106	376	250	104	150
C&D	17	38	56	40	34	10
Comingle	22	10	17	10	27	1
Glass	-	-	-	-	9	123
Mixed Paper	321	262	146	93	88	73
OCC	23	15	118	116	105	55
Single-Stream	28	427	769	1,002	939	500
Sorted Paper (SOP)	8	-	-	-	-	-
Tires	5	80	238	250	252	202
White Goods	2	16	7	-	-	-
Yard Waste	14	0.4	-	19	7	5
TOTAL	2,721	6,385	10,565	10,702	10,295	7,413

¹ "car data 1.1.2015-12.31.2020" Excel file as provided by the County in March 2021.

Figure 2-1. CAR Annual Tonnage Percent (%) Composition (by weight)



For the last five years, Municipal Solid Waste (MSW) has on average constituted about 85 percent of the overall stream.

2.2 Schools Waste Generation

Table 2.2 and Figure 2-2 shows the total amount of waste generated by FCPS for Fiscal Year (FY) 2017 to the first half of FY2021. The waste generation is categorized by waste produced at each education level (elementary schools, middle schools, and high schools) and at educational centers (e.g., FCPS Gatehouse). On average, FCPS generated approximately 13,500 tons of waste annually from FY2017 to FY2020. There was a consistent gradual increase in the total amount of waste generated per year, excluding FY20 which was impacted by the COVID-19 Pandemic.

Table 2.2 FCPS Waste Generation²

Year	Elementary Schools	Middle Schools	High Schools	Centers	Waste Total
FY17	7,201	1,618	3,530	661	13,010
FY18	7,439	1,697	3,540	694	13,370
FY19	9,628	2,288	3,084	750	15,750
FY20	7,095	1,607	3,398	672	12,772
FY21 (July 2020 - Jan 2021)	2,725	869	415	430	4,439

Figure 2-2. FCPS Waste Generation (FY17-FY20)

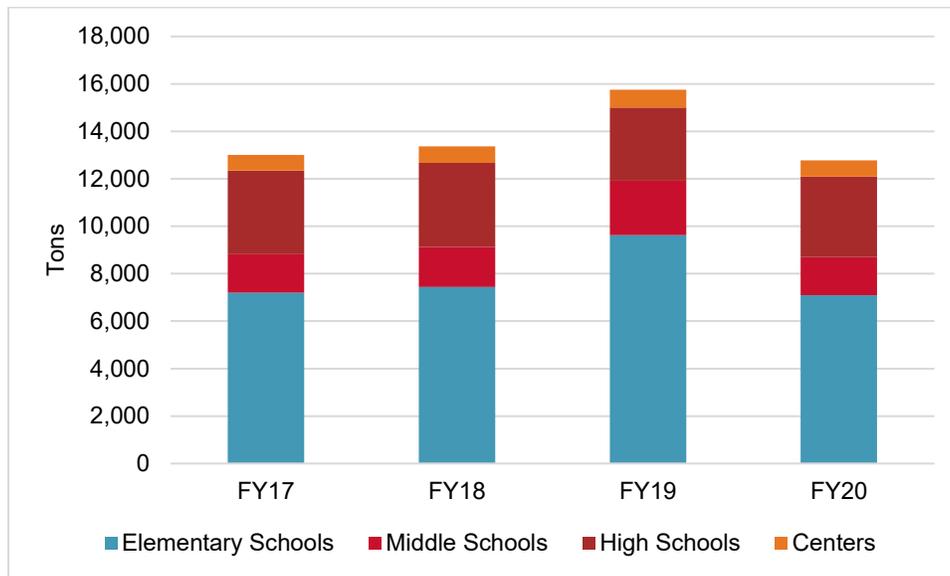


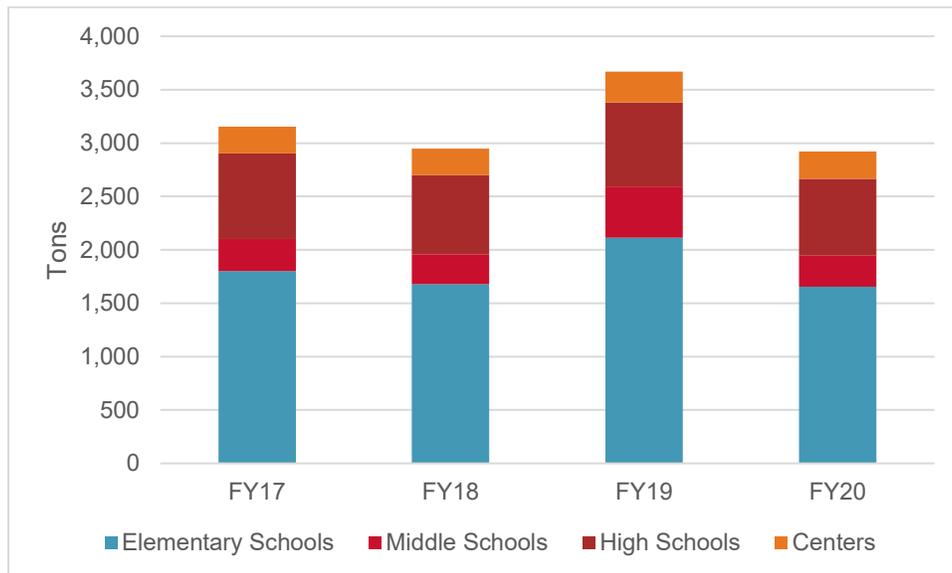
Table 2.3 and Figure 2-3 show the total amount of recycling generated by FCPS for FY2017 to the first half of FY2021. The recycling generation is categorized by waste produced at each education level and at educational centers. On average, FCPS generated approximately 3,200 tons of recycling annually from FY2017 to FY2020. The amount of recycling tends to vary between each year.

² FY17-FY2021 Summary Totals Excel files as provided by Fairfax County.

Table 2.3. FCPS Recycling Generation²

Year	Elementary Schools	Middle Schools	High Schools	Centers	Recycling Total
FY17	1,802	300	802	251	3,156
FY18	1,678	280	743	247	2,948
FY19	2,113	481	785	289	3,668
FY20	1,654	295	716	257	2,922
FY21 (July 2020 - Jan 2021)	575	148	342	135	1,200

Figure 2-3. FCPS Recycling Generation (FY17-FY20)



The total amount of waste and recycling generated by FCPS for FY2017 to the first half of FY2021 is shown in Table 2.4. From FY2017 to FY2020, an average of 17,000 tons of waste and recyclables were generated by FCPS. The percent breakdown, by weight, of waste versus recyclables is also shown. From FY2017 to FY2020, the average percent breakdown, by weight, was 19 percent recycling and 81 percent waste.

Table 2.4. FCPS Total Waste & Recycling Annual Generation and Composition

Year	Total	Recycling	Waste
FY17	16,166	20%	80%
FY18	16,318	18%	82%
FY19	19,418	19%	81%
FY20	15,694	19%	81%
FY21 (July 2020 - Jan 2021)	5,639	21%	79%

3 County and FCPS Waste Management Services and Facilities

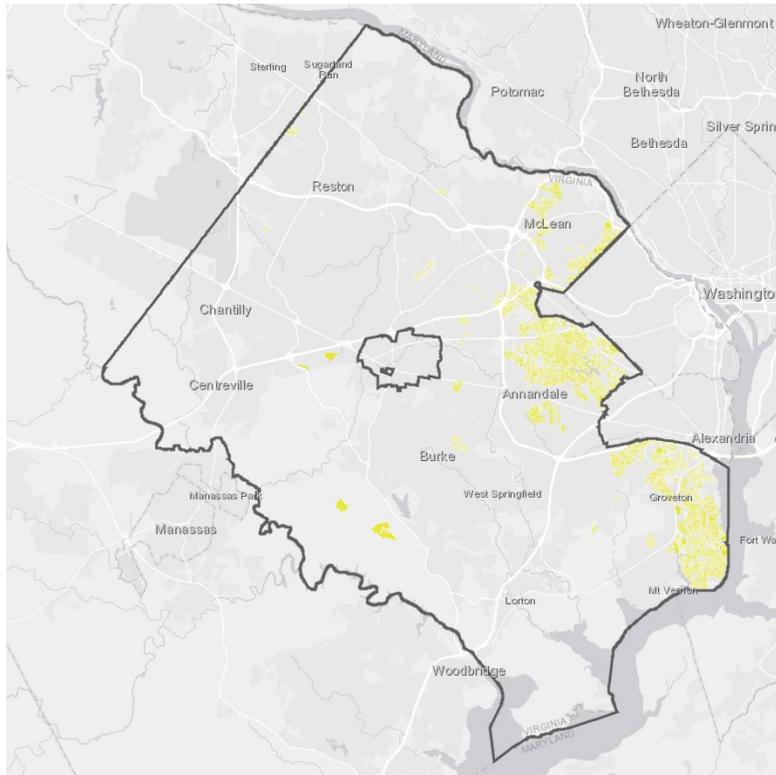
Fairfax County’s Solid Waste Management Program (SWMP) is responsible for the management and/or oversight and long-range planning for all waste collection, recycling, and disposal operations within the County. These operations apply to a County-owned and operated waste transfer station, two closed municipal solid waste landfills, a regional ash landfill operated by the County, two recycling and disposal facilities, and equipment and facilities for waste collection, disposal, and recycling operations.³

In Fairfax County, approximately 10 percent of residents and a portion of County businesses, within the Solid Waste Collection Areas receive waste and recycling collection services from the County, while the rest must use a permitted solid waste collection company or self-haul to a County disposal facility. Businesses that do not receive collection from the County may also contract with any County-permitted collection company for their waste and recycling collection and disposal. Figure 3-1 represents the Solid Waste Collection Area within Fairfax County⁴.

³ [Solid Waste Management Program - FY 2021 Adopted Budget Plan \(fairfaxcounty.gov\)](#)

⁴ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/who-picks-my-trash>

Figure 3-1. Waste Pick-Up by County Services



3.1 Solid Waste Services

The following sections describe solid waste services, including collection, disposal, and recycling, offered to County facilities (including parks) and FCPS.

3.1.1 Collection and Hauling at County Facilities

The CAR program operates weekly waste and recycling collection services for approximately 284⁵ locations owned and operated by the County, including government offices, parks, public safety buildings (fire, police, etc.), operational/maintenance facilities, public places (courts, community centers, libraries, etc.), social services facilities, George Mason University and the Northern Virginia Community College-Annandale Campus.⁶ The CAR program also provides County departments and community partners with pre-scheduled bulk collection as well as collection services for special events hosted at County agency served locations. The CAR program does not collect waste from properties leased by the County nor FCPS. The CAR program collects waste and recycling either through dumpsters using a front-end truck or a compactor using a roll-off truck. Often, recyclables from County facilities are first taken to the I-66 Transfer Station and then sent to the American Recycling Center, a privately owned and operated Materials Recovery Facility (MRF).

⁵ CAR Customers FY2021 Excel file as provided by Fairfax County.

⁶ [LOB 353, County Agency Route \(Solid Waste Management\) - 2016 Lines of Business \(Fairfax County Virginia\)](#)

- **Dumpsters and Front-End Trucks:** Most County properties receive weekly collection through the use of dumpsters and front-end trucks. The material is then either transported to either of the County's two solid waste disposal facilities, the I-66 Transfer Station and the I-95 Landfill Complex, or to a recyclables processing facility. Often recyclables from County facilities are first taken to the I-66 Transfer Station and then sent to the American Recycling Center MRF in Manassas, VA.
- **Compactors and Roll-Off Trucks:** Larger properties collect waste or recyclables through the use of a compactor, which is a waste collection device (typically 20 cubic yards or larger) with a motorized compactor blade that compacts the load to allow more waste storage. A roll-off truck that has a bed that can be raised to deliver or remove a compactor is then used for transport when the compactors are full. The truck transports the compactors to either of the two aforementioned solid waste disposal facilities or to a recyclables processing facility.
- **Interior Containers:** In addition to exterior containers, CAR customers are also provided with interior containers for the collection of recyclables within the buildings. Some of these containers are white cardboard boxes for the collection of paper, small blue containers with white swinging handles for the collection of recyclables in individual workspaces, and bottle and can containers located in common spaces throughout the buildings. There are no known privately-owned waste collection services that also provide interior containers.
- **Additional Services:** The CAR program also provides container maintenance services, including supplying new signs, container painting, top replacement and welding of broken joints as well as on-call services.

3.1.2 Collection and Hauling at FCPS

There are approximately 207 physical locations with approximately 190,000 students and 30,000 staff that make up the FCPS program. FCPS has two major waste/recycling contracts in place for the hauling of all waste and single-stream recycling with Bates Trucking Company and Republic Services.

For 27 schools, Bates Trucking Company is contracted to pick up compacted waste. The remainder of schools have waste collection through Republic Services.

Republic Services is contracted to pick up recyclables from all FCPS locations and transports them to its MRF. Schools participate in single-stream recycling and the following items are accepted as part of collection⁷:

- #1 Plastic bottles (water and soda)
- #2 Plastic containers (milk and detergent)
- Cans (aluminum and steel)
- Cardboard
- Colored paper

⁷ <https://get2green.fcps.edu/recycle.html>

- Computer paper
- Mixed paper (any paper except for glossy magazine paper and shredded paper)
- Newspapers
- Paper bags

However, the past several years, milk aseptic cartons have not been accepted by Republic Services as recyclable material.

3.1.3 Food Waste Diversion Pilot Programs – Participating Locations

The County and FCPS have piloted various food waste diversion programs. To elaborate on the information in the Plan, the following information is provided regarding participants of such pilots. All pilots have been operated on a voluntary, opt-in basis. In most cases, funding limited the total number of participants.

County Compost Program Participants:

The following County departments participate in the County Compost Program: Department of Finance, County Attorney, Department of Vehicle Services (DVS) West Ox, Department of Planning & Development, DPMM, SWMP, Office of Environmental & Energy Coordination, Park Authority, Office of Strategy Management, Kings Park Library, Reston Library, and Board of Supervisor Offices.

FCPS Commercial Compost Collections Pilot:

For two years, 2014-2015, Olde Creek Elementary School conducted a compost collection pilot with a commercial hauler.

FCPS On-Site Composting:

The following 44 FCPS schools composted on-site as of December 2019. These operations primarily composted food waste. Due to the COVID-19 pandemic, many of these programs have been put on hold.

- | | |
|------------------------------------|------------------------------------|
| • Belvedere Elementary School | • Belle View Elementary School |
| • Centreville Elementary School | • Carson Middle School |
| • Clearview Elementary School | • Churchill Road Elementary School |
| • Colvin Run Elementary School | • Clermont Elementary School |
| • Daniels Run Elementary School | • Cub Run Elementary School |
| • Fairfax High School | • Dranesville Elementary School |
| • Fairview Elementary School | • Fairhill Elementary School |
| • Fox Mill Elementary School | • Flint Hill Elementary School |
| • Herndon Elementary School | • Hayfield Secondary School |
| • Hollin Meadows Elementary School | • Herndon Middle School |
| • Jackson Middle School | • Hunters Woods Elementary School |

- Lake Anne Elementary School
- Lanier Middle School
- Lemon Road Elementary School
- Louise Archer Elementary School
- McNair Elementary School
- Pine Spring Elementary School
- Pulley Career Center
- Riverside Elementary School
- Terraset Elementary School
- West Potomac High School
- Woodley Hills Elementary School
- Justice High School
- Lane Elementary School
- Lee High School
- London Towne Elementary School
- Lynbrook Elementary School
- Mountain View Alternative High School
- Providence Elementary School
- Quander Road School
- Stratford Landing Elementary School
- Twain Middle School
- Westfield High School

3.2 County-Owned Waste Management Facilities

Fairfax County owns the I-66 Transfer Station and the I-95 Landfill Complex, which are both maintained by the SWMP. Residents, County waste collection, and private waste collectors can use both facilities. Both facilities also allow residents to drop off food waste which is processed at a permitted composting facility operated by a contractor⁸ and also operate brush grinding operations that produce double-shredded wood mulch offered free to residents⁹.

3.2.1 I-66 Transfer Station

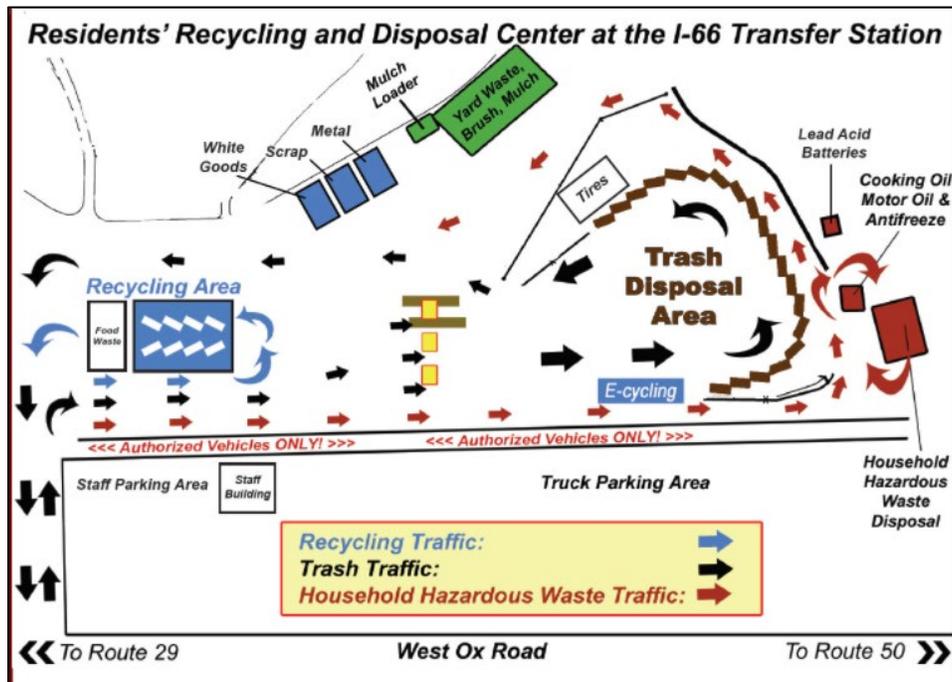
The I-66 Transfer Station, located at 4618 West Ox Road in Fairfax, consists of a closed municipal landfill and a recycling/disposal center for County residents and businesses. All CAR collected recyclables are taken to this facility and ultimately transported to the American Recycling Center in Manassas, VA¹⁰. There are separate recycling areas that have designated locations for each type of material that is separate from the MSW deposit area as seen in Figure 3-2.

⁸ [Food Scraps Composting Drop Off | Public Works and Environmental Services \(fairfaxcounty.gov\)](https://www.fairfaxcounty.gov/public-works/food-scrap-composting)

⁹ [Free Mulch | Public Works and Environmental Services \(fairfaxcounty.gov\)](https://www.fairfaxcounty.gov/public-works/free-mulch)

¹⁰ County correspondence on May 19, 2021.

Figure 3-2. I-66 Facility Layout¹¹



Recyclables accepted at the I-66 Transfer Station include:

- Bicycles
- Food scrap
- Aluminum & Steel Cans
- Plastic Bottles and Jugs
- Glass Bottles
- Mixed Paper
- Cardboard
- Antifreeze
- Used Motor Oil
- Automobile Batteries
- Metals
- Cooking Oil
- Milk & Juice Cartons
- E-Cycling
- Household Hazardous Waste

The facility collects resident, business, County, and private hauler solid waste. The MSW is collected and then transferred to the Covanta E/RRF located in Lorton, VA¹².

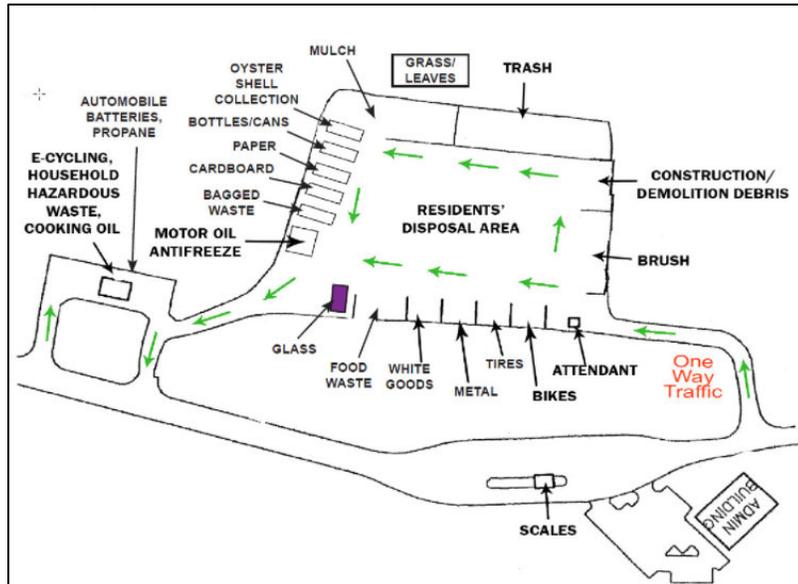
¹¹ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/i-66-transfer-station>

¹² <https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/i-66-rules.pdf>

3.2.2 I-95 Landfill Complex

The I-95 Landfill Complex, located at 9850 Furnace Road in Lorton, consists of a residential recycling drop-off center, the Covanta E/RRF, and an ash landfill. The layout of the entire complex can be seen in Figure 3-3.

Figure 3-3. I-95 Facility Layout¹³



The residential recycling drop-off area has designated bins for separated recyclables, including¹⁴:

- Glass
- Food Waste
- White Goods
- Metals
- Tires
- Bikes
- Yard Waste
- Oyster Shell Collection
- Bottles and Cans
- Mixed Paper
- Cardboard
- Bagged Waste
- Antifreeze/Used Motor Oil
- Automobile Batteries
- Cooking Oil
- E-Cycling
- Household hazardous waste

¹³ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/locations-hours>

¹⁴ [I-95 Landfill Complex | Public Works and Environmental Services \(fairfaxcounty.gov\)](#)

The I-95 Energy/Resource Recovery Facility (E/RRF)¹⁵ is owned and operated by Covanta Fairfax, Inc. This facility is one of the largest waste-to-energy facilities in the country, processing 3,000 tons per day and has been in operation since 1990. Using the MSW that is delivered, the complex generates approximately 670 kilowatts of electricity for every ton of waste burned. Metal is separated from the rest of the waste which gets diverted to be recycled. The ash is then deposited into the ash landfill on-site.

The I-95 Landfill Complex contains a functioning ash landfill and a closed municipal waste landfill. Construction and demolition (C&D) debris such as dirt, concrete, and shingles are accepted at the landfill in moderate amounts¹⁶.

3.2.3 Newington Collections Operations Facility¹⁷

The Newington Maintenance facility falls under the jurisdiction of the DVS¹⁸. The DVS provides fleet management and maintenance services to the County's and FCPS' vehicle fleets and ancillary equipment used for waste and recycling collection. The Newington Complex currently houses the County's collection fleet along with administrative facilities for personnel.

3.2.4 Logistics Center Complex

The Fairfax County Logistics Center Complex, as part of the Material Management Division of the Department of Procurement and Material Management, is a 63,000 square-foot facility that houses dynamic warehouse operations. The Zero Waste operations of the complex incorporate vehicles, scrap metal, recyclable material, and single-source material. The complex diverts obsolete and surplus items from landfills or incineration in four different ways¹⁹:

1. Redistribution and sale of surplus assets, including vehicles and large apparatus equipment – The Logistics Center collects then sells or redistributes items such as office equipment, furniture, exercise equipment, artwork, and miscellaneous items that still have value. In FY2019, the sales, recycling, and sole material sourcing of used items through operational efforts, online outreach (publicsurplus.com) and Capital Auto partnerships diverted approximately 4,000 tons of material.
2. Book and paper recycling – The Logistics Center collects and redistributes hundreds of books daily for the County's public libraries. All books, magazines, and newspapers deemed damaged or obsolete are recycled as part of the County's paper recycling program. More than 100 tons of paper products are collected at the complex annually.

¹⁵ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/energy-resource-recovery-facility>

¹⁶ <https://www.fairfaxcounty.gov/publicworks/sites/publicworks/files/assets/documents/i-95-rules.pdf>

¹⁷ <https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2019/advertised/cip/solid-waste.pdf>

¹⁸ <https://www.fairfaxcounty.gov/contact/Mobile/AgencyDetail.aspx?agId=10>

¹⁹ "Path to Zero Waste (Funding)" PowerPoint, as provided by Fairfax County (April 2021).

3. Electronic waste recycling – All broken and outdated office electronics from County agencies are collected and processed by the Logistics Center. In 2019, the complex diverted more than 40,000 pounds (20 tons) of electronic waste from Covanta’s E/RRF, which returned plastic, glass and valuable materials back into the production stream. Recycling electronic waste creates opportunities for partnerships throughout the County. For example, C2 Management is contracted to securely destroy sensitive data left on computer hard drives and cell phones.
4. Scrap metal recycling – The complex collects any materials that are not considered usable or sellable and extracts the metals out of them before disposal. The scrap metal is then palleted and ultimately collected by Smith Industries Inc. The process earns revenue for the County and limits the amount of waste incinerated. In FY2019, the Logistics Center recycled approximately 97,113 pounds (48.6 tons) of scrap metal.

4 Legislation and Regulations

Fairfax County’s solid waste management programs are governed by federal, state, and local regulations. Major federal laws and regulations can be seen in Table 4.1.

Table 4.1 Federal laws and Regulations Governing Solid Waste Management

Federal Laws	Primary Objective
<i>Resource Conservation and Recovery Act (RCRA)</i>	Creates the framework for the proper management of hazardous and non-hazardous solid waste from “cradle-to-grave”. Promotes the recycling and reuse of recoverable material.
<i>Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Superfund Law</i>	Identification and remediation of waste disposal sites and assigns liability for contamination.
<i>Clean Water Act</i>	Addresses the discharge of wastewater and runoff from solid waste management facilities into surface waters.
<i>Clean Air Act</i>	Addresses and authorizes regulations for emissions from waste disposal facilities.
<i>Safe Drinking Water Act</i>	Provides and establishes maximum contaminant levels for parameters in ground water.
<i>Federal Emergency Management Act</i>	Prohibits siting of landfills within 100-year flood plain.

Federal Laws	Primary Objective
<i>Asbestos Control- Asbestos Hazard Emergency Response Act</i>	Requires control with asbestos materials and requires completion of a training program by those who do asbestos-related work with schools.
<i>Endangered Species Act</i>	Prohibits construction or operation of facilities that would result in the “taking” of an endangered or threatened wildlife species, or in the destruction of their critical habitat.

Table 4.2 summarizes Virginia’s Solid waste management regulations throughout the County and within the FCPS system.

Table 4.2 State Laws and Regulations Governing Solid Waste

State Statutes	Primary Objective
The Code of Virginia Chapter 81 ²⁰	Establishes standards and procedures pertaining to the management of solid waste by providing requirements for siting, design, construction, operation, maintenance, closure, and post closure.
Regulation 8541.3 ²¹	Recycling requirements for all Fairfax County Public Schools.
Regulation 5030.6 ²²	To establish guidelines and procedures for the redistribution and disposal of FCPS equipment, furniture, books, and other non-accountable, controlled, and capital assets.
Solid Waste Management Code Chapter 109.1 ²³	Recycling program requirements for Fairfax County solid waste management.
Facilities and Transportation Services Regulation 8541.4 ²¹	Require all FCPS facilities to recycle to the maximum extent possible.

²⁰ <http://law.lis.virginia.gov/admincode/title9/agency20/chapter81/>

²¹ [https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/BAPT466358BA/\\$file/R8541%20.pdf](https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/BAPT466358BA/$file/R8541%20.pdf)

²² [https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/B37SUC687082/\\$file/R5030.pdf](https://go.boarddocs.com/vsba/fairfax/Board.nsf/files/B37SUC687082/$file/R5030.pdf)

²³ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/recycling-office-and-retail-properties>

State Statutes	Primary Objective
Executive Order 77 ²⁴	All executive branch state agencies, including state institutions of higher education, and their concessioners (Agency or Agencies) shall discontinue buying, selling, or distributing these specific items: disposable plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, and single use plastic water bottles.
House Bill 533 ²⁵	Bans the use of expanded polystyrene food service containers for all food vendors by 2025.

5 Funding & Financial Information

There are four main funds that support the waste (refuse) collection, recycling and disposal operations in Fairfax County:

- Leaf Collection, Fund 40130
- Refuse Collection and Recycling Operations, Fund 40140
- Refuse Disposal, Fund 40150
- I-95 Refuse Disposal, Fund 40170

Each funding program is described in further detail below.

5.1 Program Funding²⁶

5.1.1 Leaf Collection, Fund 40130

Fairfax County offers a curbside leaf collection service multiple times throughout the year. This program is funded by a levy charge to homeowners that reside in the leaf collection district (approximately 25,000 homes). The current rate for leaf collection is \$0.012 per \$100 of assessed real estate value.

²⁴ [EO-77-Virginia-Leading-by-Example-to-Reduce-Plastic-Pollution-and-Solid-Waste.pdf](#)

²⁵ [LIS > Bill Tracking > HB533 > 2020 session \(virginia.gov\)](#)

²⁶

<https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2021/adopted/volume2/solid-waste-overview.pdf>

5.1.2 Refuse Collection and Recycling Operations, Fund 40140

This fund provides for the collection of waste and recycling services. Households in Fairfax County's sanitary district pay an annual fee to partly generate revenue for the fund. Approximately 43,100 individual households receive collection at an annual collection rate of \$370 per household, which equates to approximately \$16 million in revenue for FY2021. County agencies generate revenue for the fund through billings based on the cubic yard capacity of the containers provided. In FY2021, the billing rate as determined by fiscal year operating requirements was \$5.50 per cubic yard.²⁷ This fund supports the CAR program which is responsible for waste and recycling collection at 284 County agency facilities.

5.1.3 Refuse Disposal, Fund 40150

Refuse Disposal Fund 40150 funds the operations at the I-66 Transfer Station and also supports the SWMP's recycling program due to the necessary funds needed to manage program initiatives that reduce waste and plan for future recycling programs. The Refuse Disposal Fund is supported by the tipping fees or contract rate from either residents, private collectors, or county agencies at either the I-66 Transfer Station or the I-95 Landfill Complex²⁸. The commercial tipping fee for solid waste at the I-66 Transfer Station Complex and the I-95 Landfill Complex are represented in Table 5.1.

Table 5.1 Commercial Tipping Fees FY21²⁹

Category	Rate
Waste	\$64/ton
Metal	\$64/ton
Brush	\$45/ton
Yard Waste (loose or bagged)	\$62/ton
Vacuumed Leaves	\$42/ton

5.1.4 I-95 Refuse Disposal, Fund 40170

The operations of the I-95 Landfill Complex are funded through Fund 40170. The I-95 Landfill Complex used to manage MSW but was closed in December 1995. Since that time, the landfill has accepted only ash generated from waste combustion from Covanta's E/RRF. The funded operations include operations and maintenance of both the closed and active portions of the landfill. The refuse disposal fee at the I-95 Landfill Complex, which is currently \$26.50 per ton, finances Fund 40170.

²⁷ [Solid Waste Management Program - FY 2021 Adopted Budget Plan \(fairfaxcounty.gov\)](https://www.fairfaxcounty.gov/publicworks/recycling-trash/residential-disposal-fees-and-regulations)

²⁸ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/residential-disposal-fees-and-regulations>

²⁹ <https://www.fairfaxcounty.gov/publicworks/recycling-trash/commercial-disposal-fees>

5.1.5 School Funding

FCPS have contracts with both Bates Trucking and Republic Services to collect their waste and recycling. The FCPS Plant Operations Program³⁰ manages contract custodial services vendors, FCPS recycling efforts, and all custodial related contracts to waste management and other efforts to provide a clean and healthy environment in schools.

5.2 Capital Improvement Program Budget

In FY2021, Fairfax County budgeted approximately \$28 million in the Capital Improvement Program (CIP) to make improvements to its solid waste facilities. The list of projects as part of the CIP are described in Table 5.2.

Table 5.2 Fairfax County Solid Waste FY21 Capital Improvement Projects

Capital Project ³¹	Description	Cost
Newington Refuse Facility Enhancements	Fund infrastructure improvements to the existing Newington Operations facility.	\$2,356,000
I-66 Environmental Compliance	Fund the environmental management activities for the I-66 landfill which was closed in 1982.	\$751,000
I-66 Basement Drainage Renovation	Provide for the repair and possible retrofit of the tipping floor drainage system.	\$350,000
I-66 Landfill Methane Gas Recovery	The installation and reconstruction of the methane gas extraction system.	\$1,000,000
I-66 Permit/Receiving Center Renovation	Renovations to the existing building and transfer facility at the I-66 Transfer Station.	\$2,403,000
I-66 Transport Study/Site Redevelopment	Provide the design, construction, reconstruction, and retrofit of the I-66 Transfer Station's existing traffic flow patterns.	\$2,904,000

³⁰ <https://www.fcps.edu/sites/default/files/media/pdf/FY-2021-Program-Budget.pdf>

³¹ <https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2021/advertised/cip/15a-solid%20waste.pdf>

Capital Project³¹	Description	Cost
I-95 Landfill Methane Gas Recovery	The installation and reconstruction of the methane gas extraction system.	\$2,309,000
I-95 Landfill Environmental Compliance	Support two environmental initiatives associated with the I-95 complex.	\$1,560,000
I-95 Landfill Leachate Facility	Minor improvements to the leachate collection system.	\$4,160,000
I-95 Landfill Closure	Meet all state and federal regulations for placing the synthetic cap on the Area Three Lined Landfill unit and repairing or reconstructing the cap on the Municipal Solid Waste (MSW) unit at the I-95 Landfill.	\$2,440,000
I-95 Landfill Lot B Redesign	Design, construction, reconstruction and retrofit of the I-95 landfill's existing Lot B area which is used for various residential solid waste drop-off activities.	\$1,750,000
I-95 Operations Building Renovations	Infrastructure improvements to the existing I-95 Landfill Operations facility.	\$99,000
I-95 Transfer/Materials Recovery Facility	Design and construction of an enclosed facility to handle general waste and recycling efforts at the I-95 Complex.	\$2,500,000
I-95 Service Road	Redesign and rebuilding of I-95's existing entrance road which is the primary access point for residential disposal and recycling customers and commercial haulers.	\$1,500,000

6 Contract Review

6.1 County Facilities

The CAR program provides waste and recycling collection services to properties owned and operated by the County³². Per the Intercounty Agreement between Prince William County and Fairfax County, the annual amount of Fairfax County waste delivered to the Prince William County landfill shall not exceed 30,000 tons³³.

6.2 Schools

6.2.1 Waste

Bates Trucking Company was awarded a contract with FCPS in November 2020 for a three-year period with the option to renew³⁴. Waste is picked up once a week from schools by Bates at a unit price of \$127.00 per haul, that is \$6,604.00 per year. Bates' current contract is for \$178,308 for the 27 schools³⁵. FCPS pays for the actual tonnage cost per pick-up as a pass-through fee based on Fairfax County disposal rates listed in Table 6.1. Republic Services is responsible to pick up all front-end waste, excluding the 27 locations, from all FCPS locations. Bates Trucking commercial disposal rates are in Table 6-1 and Republic Service's cost per collection is in Table 6-2.

Table 6.1 Bates Trucking Commercial Disposal Rates

Category	Rate
Waste	\$68/ton
Metal	\$68/ton
Brush	\$45/ton
Yard Waste (loose or bagged)	\$62/ton
Vacuumed Leaves	\$42/ton

³² https://www.fairfaxcounty.gov/budget/sites/budget/files/assets/documents/fy2016/lobs/lob_353.pdf

³³ Interjurisdictional Solid Waste Facility Use Agreement as provided by Fairfax County (March 2021).

³⁴ <https://www.fcps.edu/about-fcps#:~:text=FCPS%20is%20one%20of%20the,12%2C%20speaking%20over%20200%20languages>

³⁵ <https://www.fairfaxcounty.gov/register/DownloadPDF.aspx?AttachmentID=12b9dd96-ba70-4f48-92bd-985047382166>

Table 6.2. Republic Services FCPS Waste Collection Costs³⁶

Item No.	Item Description	Unit Price Per Collection
1	Cost per collection of front-end load waste container 2 cubic yard (CY)	\$5.74
2	Cost per collection of front-end load waste container 4 CY	\$11.49
3	Cost per collection of front-end load waste container 6 CY	\$17.23
4	Cost per collection of front-end load waste container 8 CY	\$22.99
5	Cost per collection of open top roll off container 20 CY	\$409.61
6	Cost per collection of open top roll off container 30 CY	\$415.23

6.2.2 Recycling³⁷

Republic Services of Virginia is contracted for the waste and recycling services of FCPS. The current contract as amended to their previous contract, had a 3.3 percent price increase effective January 1, 2021. Updated collection prices for Republic are reflected in Table 6.3. In addition, FCPS uses separate contractors to handle light bulb recycling, metal recycling, glazing recycling (glass windows, etc.) and electronics recycling. Per Republic's contract, the school system is not to place milk cartons in the recycling stream.

³⁶ [Current County Contracts \(Contract Register\) - Contract Register - Fairfax County, Virginia](#)

³⁷ <https://www.fairfaxcounty.gov/cregister/DownloadPDF.aspx?AttachmentID=426118ae-4f86-48b8-ab41-96109dda274e>

Table 6.3 Republic Services FCPS Recycling Collection Costs

Item No.	Item Description	Unit Price
7	Cost per collection of front-end load recycle container 2 CY	\$3.56
8	Cost per collection of front-end load recycle container 4 CY	\$7.13
9	Cost per collection of front-end load recycle container 6 CY	\$10.68
10	Cost per collection of front-end load recycle container 8 CY	\$14.24

7 Summary

The diversion performance and current conditions evaluated for Fairfax County show that while diversion and recycling is currently happening, there could be improvement in the diversion of recyclable, reusable and/or compostable materials from the MSW stream collected from County facilities (including administration offices, parks, maintenance facilities, etc.) and FCPS.

The next step is to identify potential diversion options or programs that could further improve the County's diversion rates to help make progress towards a future goal of Zero Waste. The aforementioned current diversion programs could also potentially be expanded upon as part of this effort.

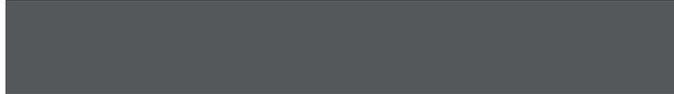


Appendix C

Waste and Recycling Audit Memo

Zero Waste Plan Development

Fairfax, VA
June 23, 2021





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Contents

1	Administrative/Office Locations	2
1.1	Waste	2
1.2	Recycling	2
1.3	Organics	3
2	Public Safety Locations	4
2.1	Waste	4
2.2	Recycling	5
2.3	Organics	5
3	Park Authority Locations	6
3.1	Waste	6
3.2	Recycling	7
4	Public Place Locations	8
4.1	Waste	8
4.2	Recycling	9
4.3	Organics	9
5	School Locations	10
5.1	Waste	10
5.2	Recycling	11
6	Social Services Location	12
6.1	Waste	12
6.2	Recycling	12
7	Operations/Maintenance Locations	13
7.1	Waste	13
7.2	Recycling	14
8	Results Summary	16
8.1	Overall Waste	16
8.2	County Facility Waste Audit Results	18
8.3	Overall Recycling	19
1.1.1	County Facility Recycling Audit Results	20



Tables

Table 1. Waste Audit Results for Admin/Office Locations (% by Volume)	2
Table 2. Recycling Audit Results for Administrative/Office Locations (% by Volume).....	3
Table 3. Recycling Audit Results for Each Government Center Building Compactor (% by Volume)	3
Table 4. Waste Audit Results for Public Safety Locations (% by Volume)	4
Table 5. Recycling Audit Results for Public Safety Locations (% by Volume).....	5
Table 6. Waste Audit Results for Park Authority Locations (% by Volume)	6
Table 7. Recycling Audit Results for Park Authority Locations (% by Volume).....	7
Table 8. Waste Audit Results for Public Place Locations (% by Volume)	8
Table 9. Recycling Audit Results for Public Place Locations (% by Volume).....	9
Table 10. Waste Audit Results for School Locations (% by Volume)	10
Table 11. Recycling Audit Results for School Locations (% by Volume).....	11
Table 12. Waste Audit Results for the Social Services Location (% by Volume)	12
Table 13. Recycling Audit Results for the Social Services Location (% by Volume).....	13
Table 14. Waste Audit Results for the Operations/Maintenance Locations (% by Volume).....	13
Table 15. Recycling Audit Results for Operations/Maintenance Locations (% by Volume)	15
Table 16. Weighted Average Waste Audit Results for All Locations (% by Volume)	17
Table 17. Weighted Average Waste Audit Results for County Facility Locations (% by Volume).....	18
Table 18. Weighted Average Recycling Audit Results for All Locations (% by Volume).....	19
Table 19. Weighted Average Recycling Audit Results for County Facility Locations (% by Volume)	20

Memo

Date: Wednesday, June 23, 2021

Project: Technical Support for Zero Waste Plan Development

To: Fairfax County Solid Waste Management Program, Purchasing and Materials Management, Fairfax County Public Schools, Fairfax County Park Authority, and Facilities Management Department

From: HDR

Subject: Waste and Recycling Audit Results Interim Memorandum

HDR, with the help of Fairfax County, conducted waste & recycling audits within Fairfax County as part of the Fairfax County Government and Schools Zero Waste Plan project. These audits took place at 20 total locations, comprising a mixture of Government administration buildings/offices (2 locations), public safety buildings (3 locations), Fairfax County Park Authority (FCPA) locations (4 locations), public places (3 locations), schools (5 locations), a social services building (1 location), and operations/maintenance facilities (2 locations). The audits occurred over the course of a four-day period during the week of April 12, 2021.

Once all waste or recycling material was fully sorted into the pre-determined different material categories, it was visually estimated what qualitative percentage (by volume) each material comprised of the present total garbage or recyclables. The following are preliminary results of the audits, first by location type and then an overall summation.

It is important to note that due to the COVID-19 pandemic, most of the buildings were not occupied at full capacity, and the results of the audits may not depict what would be seen during normal conditions.

1 Administrative/Office Locations

Waste and recycling audits were conducted at the following administrative/office locations:

- 1 Fairfax County Government Center Building (12000 Government Center Pkwy, Fairfax, VA 22035)
- 2 Fairfax County Public Schools (FCPS) Gatehouse Administration Center (8115 Gatehouse Rd, Falls Church, VA 22042)

1.1 Waste

The results (in percent by volume) of the waste audit for administrative/office locations are shown in Table 1. It is important to note that waste from the Gatehouse was unable to be sorted due to a locked enclosure.

Table 1. Waste Audit Results for Admin/Office Locations (% by Volume)

Material Type	Government Center Building
Garbage	60%
Edible/Recoverable Food	5%
Other Compostables (e.g., yard waste, low-grade paper)	5%
Cardboard	5%
Other Recyclable Paper (e.g., office paper, magazines)	0%
Recyclable Plastic Containers	20%
Other Recyclable Containers (e.g., metal, aluminum, glass)	5%
Other Potential Recyclables (e.g., fluorescent bulbs, e-waste, batteries)	0%
Other Potential Reusables (e.g., textiles, furniture)	0%
Total	100%

Note:

*No waste sorting occurred at the Gatehouse (FCPS).

The most divertable waste material found in the waste stream was recyclable plastic containers. There was a high percentage of garbage (e.g., needle packaging, gloves, etc.) partly because the Government Center Building is currently being used as a COVID-19 vaccination hub.

1.2 Recycling

The results (in percent by volume) of the recycling audit for administrative/office locations are shown in Table 2. The Fairfax County Government Center Building’s recycling was collected from two separate compactors: (1) Cardboard/Paper and (2) Plastic/Glass. It was assumed that of the overall recyclables generated, 50 percent (by volume) went to the cardboard/paper compactor and the other 50 percent (by volume) went to the plastic/glass compactor.

Table 2. Recycling Audit Results for Administrative/Office Locations (% by volume)

Material Type	Gatehouse (FCPS)	Government Center Building*	AVG	Std Dev	Min	Max
Cardboard	20%	48%	34%	14%	20%	48%
Other Recyclable Paper	10%	3%	6%	4%	3%	10%
Recyclable Plastic Containers	35%	28%	31%	4%	28%	35%
Other Recyclable Containers	0%	5%	3%	3%	0%	5%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%
Non-Recyclables	35%	18%	26%	9%	18%	35%
Total	100%	100%	100%	0%	100%	100%

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**Assumed 50/50 split between recycling going to the cardboard/paper and the plastic/glass compactors.

The main non-recyclables found in the recycling streams were plastic film, pens, coffee cups, and shredded paper.

The material breakdown (in percent by volume) for solely the Government Center Building's cardboard/paper compactor and the plastic/glass compactor is in Table 3.

Table 3. Recycling Audit Results for Each Government Center Building Compactor (% by volume)

Cardboard/Paper Compactor	%
Cardboard	95%
Other Recyclable Paper	5%
Total	100%
Plastic/Glass Compactor	%
Recyclable Plastic Containers	55%
Other Recyclable Containers	10%
Other Potential Recyclables	0%
Non-Recyclables	35%
Total	100%

The cardboard/paper compactor had very little contamination. The plastic/glass compactor had 35 percent (by volume) contamination. It should be noted that glass is no longer accepted in Fairfax County's recycling collection; however, glass counted for very little of this contamination.

1.3 Organics

The Fairfax County Government Center Building has organics collection as part of Fairfax County's Compost Pilot Program. During the time of the audit, organics collection had already occurred. The organics bins were empty, so this sorting subset did not occur.

2 Public Safety Locations

Waste and recycling audits were conducted at the following public safety locations:

1. Fairfax County Fire Station 40 (4621 Legato Rd, Fairfax, VA 22030)
2. Mount Vernon Government Center and Police Station (2511 Parkers Ln, Alexandria, VA 22306)
3. Reston Police Station (1801 Cameron Glen Dr, Reston, VA 20190)

2.1 Waste

The results (in percent by volume) of the waste audit for public safety locations are shown in Table 4.

Table 4. Waste Audit Results for Public Safety Locations (% by Volume)

Material Type	Fairfax Center Fire Station 40	Mount Vernon Government Center & Police Station	Reston Police Station	AVG	Std Dev	Min	Max
Garbage	45%	40%	40%	42%	2%	40%	45%
Edible/Recoverable Food	0%	0%	0%	0%	0%	0%	0%
Other Compostables	30%	20%	50%	33%	13%	20%	50%
Cardboard	0%	0%	0%	0%	0%	0%	0%
Other Recyclable Paper	10%	10%	5%	8%	2%	5%	10%
Recyclable Plastic Containers	10%	20%	5%	12%	6%	5%	20%
Other Recyclable Containers	0%	10%	0%	3%	5%	0%	10%
Other Potential Recyclables	5%	0%	0%	2%	2%	0%	5%
Other Potential Reusables	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	0%	100%	100%

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper and unrecoverable food. The second most divertable material was plastic containers. The third most divertable material was other recyclable paper.

2.2 Recycling

The results (in percent by volume) of the recycling audit for public safety locations are shown in

Table 5.

Table 5. Recycling Audit Results for Public Safety Locations (% by Volume)

Material Type	Fairfax Center Fire Station 40	Mount Vernon Government Center & Police Station	Reston Police Station	AVG	Std Dev	Min	Max
Cardboard	20%	90%	62%	57%	29%	20%	90%
Other Recyclable Paper	20%	0%	24%	15%	11%	0%	24%
Recyclable Plastic Containers	20%	0%	1%	7%	9%	0%	20%
Other Recyclable Containers	20%	0%	1%	7%	9%	0%	20%
Other Potential Recyclables	0%	0%	1%	0%	0%	0%	1%
Non-Recyclables	20%	10%	12%	14%	4%	10%	20%
Total	100%	100%	100%	100%	0%	100%	100%

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

The main non-recyclables found in the recycling streams were plastic film, low-grade paper, food waste, contaminated food containers, single-use plastic cutlery, nitrile gloves and textiles.

2.3 Organics

In its staff kitchen, the Mount Vernon Government Center has organics collection as part of Fairfax County's Compost Pilot Program. During the time of the audit, organics collection had already occurred. The organics bin was empty, so this sorting subset did not occur.

3 Park Authority Locations

Waste and recycling audits were conducted at the following Park Authority locations:

1. Oak Marr RECenter (3200 Jermantown Rd, Oakton, VA 22124)
2. Audrey Moore RECenter (8100 Braddock Rd, Annandale, VA 22003)
3. Green Spring Gardens (4603 Green Spring Rd, Alexandria, VA 22312)
4. Lake Fairfax Park Maintenance Area 6 (1410 State Route 674, Vienna, VA 22182)

3.1 Waste

The results (in percent by volume) of the waste audit for Park Authority locations are shown in Table 6.

Table 6. Waste Audit Results for Park Authority Locations (% by Volume)

Material Type	Oak Marr RECenter	Audrey Moore RECenter*	Green Spring Gardens**	Lake Fairfax Park Maintenance Area 6	AVG	Std Dev	Min	Max
Garbage	45%	35%	38%	80%	49%	18%	35%	80%
Edible/ Recoverable Food	0%	5%	10%	0%	4%	4%	0%	10%
Other Compostables	35%	25%	23%	0%	21%	13%	0%	35%
Cardboard	0%	0%	0%	0%	0%	0%	0%	0%
Other Recyclable Paper	10%	8%	3%	0%	5%	4%	0%	10%
Recyclable Plastic Containers	10%	15%	15%	10%	13%	3%	10%	15%
Other Recyclable Containers	0%	13%	13%	10%	9%	5%	0%	13%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	0%	100%	100%

Notes:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**Lots of bagged yard waste in the waste dumpster due to illegal dumping. These bags were not included in the waste audit.

***Dumpster appeared to include waste from the golf course across the street. Waste from a singular park trash can was taken to ensure a comprehensive sample.

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper and yard waste, with some unrecoverable food. The second most divertable material was plastic containers. The third most divertable material was other recyclable containers, including metal and aluminum containers.

The garbage at Lake Fairfax Park Maintenance Area 6 constituted a high percentage by volume. Its garbage mainly consisted of plastic coffee lids, firework residual materials, contaminated food containers, dog feces and plastic film.

3.2 Recycling

The results (in percent by volume) of the recycling audit for Park Authority locations are shown in

Table 7. It is important to note that recycling from the Green Spring Gardens location was unable to be sorted due to a locked enclosure it shares with the adjacent golf course.

Table 7. Recycling Audit Results for Park Authority Locations (% by Volume)*

Material Type	Oak Marr RECenter	Audrey Moore RECenter	Lake Fairfax Park Maintenance Area 6	AVG**	Std Dev	Min	Max
Cardboard	90%	50%	0%	47%	37%	0%	90%
Other Recyclable Paper	0%	10%	15%	8%	6%	0%	15%
Recyclable Plastic Containers	5%	5%	15%	8%	5%	5%	15%
Other Recyclable Containers	0%	5%	5%	3%	2%	0%	5%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%
Non-Recyclables	5%	30%	65%	33%	25%	5%	65%
Total	100%	100%	100%	100%	0%	100%	100%

Notes:

*No recycling sorting occurred at Green Spring Gardens.

**Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

The main non-recyclables found in the recycling streams were construction and demolition debris (C&D) (e.g., wood and rebar), Styrofoam, and shredded paper. Although not verified, the recyclables at Lake Fairfax Park Maintenance Area 6 appeared to come from illegal dumping and not the park maintenance building. The Lake Fairfax Park Maintenance Area 6 non-recyclables mainly consisted of food waste containers and single-use plastic cutlery.

4 Public Place Locations

Waste and recycling audits were conducted at the following public place locations:

1. Fairfax County Circuit Court (4110 Chain Bridge Rd, Fairfax, VA 22030)
2. Gum Springs Community Center (8100 Fordson Rd, Alexandria, VA 22306)
3. Reston Regional Library (11925 Bowman Towne Dr, Reston, VA 20190)

4.1 Waste

The results (in percent by volume) of the waste audit for public place locations are shown in Table 8.

Table 8. Waste Audit Results for Public Place Locations (% by Volume)

Material Type	Circuit Court*	Gum Springs Community Center	Reston Library	AVG	Std Dev	Min	Max
Garbage	39%	30%	20%	30%	8%	20%	39%
Edible/Recoverable Food	0%	10%	0%	3%	5%	0%	10%
Other Compostables	53%	30%	55%	46%	11%	30%	55%
Cardboard	0%	5%	0%	2%	2%	0%	5%
Other Recyclable Paper	5%	20%	15%	13%	6%	5%	20%
Recyclable Plastic Containers	3%	5%	0%	3%	2%	0%	5%
Other Recyclable Containers	0%	0%	5%	2%	2%	0%	5%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	5%	2%	2%	0%	5%
Total	100%	100%	100%	100%	0%	100%	100%

Note:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper and unrecoverable food. The second most divertable material was other recyclable paper.

Trash bags collected directly from the Circuit Court kitchen were included in the above waste audit results. Of the kitchen subset sampling, about 66 percent of the bags were compostable materials (33 percent low-grade paper and 33 percent mainly unrecoverable food). The remaining 33 percent and 1 percent were garbage and recyclable plastic containers, respectively.

4.2 Recycling

The results (in percent by volume) of the recycling audit for public place locations are shown in Table 9. It is important to note that recycling from the Gum Springs Community Center location was unable to be sorted due to unavailability of material.

Table 9. Recycling Audit Results for Public Place Locations (% by Volume)*

Material Type	Circuit Court***	Reston Library	AVG	Std Dev	Min	Max
Cardboard	33%	30%	32%	2%	30%	33%
Other Recyclable Paper	33%	55%	44%	11%	33%	55%
Recyclable Plastic Containers	0%	0%	0%	0%	0%	0%
Other Recyclable Containers	0%	0%	0%	0%	0%	0%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%
Non-Recyclables	33%	15%	24%	9%	15%	33%
Total	100%	100%	100%	0%	100%	100%

Notes:

*No recycling sorting occurred at Gum Springs Community Center.

**Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

***No dumpster/compactor existed for plastics/other recyclables at the Circuit Court; there was only one compactor solely for mixed paper.

The main non-recyclables found in the recycling streams were plastic film, Styrofoam, and low-grade paper.

4.3 Organics

The Reston Regional Library has organics collection as part of Fairfax County's Compost Pilot Program. The organics bin located in the staff kitchen was full and therefore sorted. In percent by volume, the compost appeared to be 99 percent compostable and only had 1 percent contamination (namely due to small coffee creamer cups).

5 School Locations

Waste and recycling audits were conducted at the following school locations:

1. Whitman Middle School (2500 Parkers Ln, Alexandria, VA 22306)
2. Stenwood Elementary School (2620 Gallows Rd, Vienna, VA 22180)
3. Luther Jackson Middle School (3020 Gallows Rd, Falls Church, VA 22042)
4. South Lakes High School (11400 South Lakes Dr, Reston, VA 20191)
5. Terraset Elementary School (11411 Ridge Heights Rd, Reston, VA 20191)

5.1 Waste

The results (in percent by volume) of the waste audit for school locations are shown in Table 10.

Table 10. Waste Audit Results for School Locations (% by Volume)

Material Type	Whitman Middle School	Stenwood Elementary School*	Luther Jackson Middle School*	South Lakes High School	Terrasets Elementary School	AVG	Std Dev	Min	Max
Garbage	20%	30%	40%	25%	30%	29%	7%	20%	40%
Edible/ Recoverable Food	25%	15%	20%	10%	20%	18%	5%	10%	25%
Other Compostables	15%	35%	25%	40%	35%	30%	9%	15%	40%
Cardboard	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Recyclable Paper	30%	15%	10%	20%	10%	17%	7%	10%	30%
Recyclable Plastic Containers	5%	3%	3%	5%	0%	3%	2%	0%	5%
Other Recyclable Containers	5%	3%	3%	0%	5%	3%	2%	0%	5%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	0%	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	0%	100%	100%

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper and unrecoverable food. The second most divertable material was edible/recoverable food mainly from school lunches. Only slightly less than recoverable food waste, other recyclable paper is the third most divertable material.

5.2 Recycling

The results (in percent by volume) of the recycling audit for school locations are shown in Table 11. It is important to note that recycling from the South Lakes High School location was unable to be sorted due to lack of availability of material.

Table 11. Recycling Audit Results for School Locations (% by Volume)*

Material Type	Whitman Middle School	Stenwood Elementary School	Luther Jackson Middle School	Terrasett Elementary School**	AVG	Std Dev	Min	Max
Cardboard	85%	95%	95%	92%	92%	4%	85%	95%
Other Recyclable Paper	4%	4%	0%	3%	3%	2%	0%	4%
Recyclable Plastic Containers	4%	0%	0%	0%	1%	2%	0%	4%
Other Recyclable Containers	2%	0%	4%	1%	2%	1%	0%	4%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%	0%
Non-Recyclables	5%	1%	1%	5%	3%	2%	1%	5%
Total	100%	100%	100%	100%	100%	0%	100%	100%

*No recycling sorting occurred at South Lakes High School.

**Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

Very little of the schools' recycling stream was found to have non-recyclable contamination. Cardboard was the major recyclable material found in all sampled school dumpsters.

6 Social Services Location

Waste and recycling audits were conducted at the following social services location:

1. Fairfax-Falls Church Community Services Board (Merrifield Center - 8221 Willow Oaks Corporate Dr, Fairfax, VA 22031)

6.1 Waste

The results (in percent by volume) of the waste audit for the social services location is shown in Table 12.

Table 12. Waste Audit Results for the Social Services Location (% by Volume)

Material Type	Fairfax-Falls Church CSB (Merrifield Center)
Garbage	40%
Edible/Recoverable Food	0%
Other Compostables	25%
Cardboard	0%
Other Recyclable Paper	15%
Recyclable Plastic Containers	15%
Other Recyclable Containers	5%
Other Potential Recyclables	0%
Other Potential Reusables	0%
Total	100%

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper with some unrecoverable food. Paper and plastic containers, both divertable, were found in equal amounts in the waste. About half of the garbage percentage, 20 percent, was due to plastic film.

6.2 Recycling

The results (in percent by volume) of the recycling audit for the social services location is shown in Table 13. Staff stated recycling is typically made up of 95 percent cardboard. Only one bag of recyclable material in the exterior dumpster was available to sort. The results are shown in the remaining 5 percent in the table below.

Table 13. Recycling Audit Results for the Social Services Location (% by Volume)

Material Type	Fairfax-Falls Church Community Services Board (Merrifield Center)
Cardboard	95%
Other Recyclable Paper	0%
Recyclable Plastic Containers	3%
Other Recyclable Containers	2%
Other Potential Recyclables	0%
Non-Recyclables	0%
Total	100%

No contamination was found in the sampled bag.

7 Operations/Maintenance Locations

Waste and recycling audits were conducted at the following operations/maintenance locations:

1. Department of Vehicle Services Alban Maintenance Facility (7245 Fullerton Rd, Springfield, VA 22150)
2. County and FCPS Springfield Central Warehouse (6800 Industrial Rd a, Springfield, VA 22151)

7.1 Waste

The results (in percent by volume) of the waste audit for operations/maintenance locations are shown in Table 14.

Table 14. Waste Audit Results for the Operations/Maintenance Locations (% by Volume)

Material Type	DVS Alban	County & FCPS Springfield Central Warehouse	AVG	Std Dev	Min	Max
Garbage	40%	45%	43%	3%	40%	45%
Edible/Recoverable Food	5%	10%	8%	3%	5%	10%
Other Compostables	20%	15%	18%	3%	15%	20%
Cardboard	20%	10%	15%	5%	10%	20%
Other Recyclable Paper	0%	15%	8%	8%	0%	15%
Recyclable Plastic Containers	15%	5%	10%	5%	5%	15%
Other Recyclable Containers	0%	0%	0%	0%	0%	0%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	0%	0%	0%	0%
Total	100%	100%	100%	0%	100%	100%

Note:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

The most divertable material found in the waste stream was other compostables, which mainly consisted of low-grade paper with some unrecoverable food. The second most divertable material was cardboard. The third most divertable material was recyclable plastic containers. Visually, a significant portion of the garbage consisted of plastic film.

7.2 Recycling

The results (in percent by volume) of the recycling audit for operations/maintenance locations are shown in Table 15. Due to the nature of operations/maintenance facilities and the Fairfax County Ordinance, only paper and cardboard are required to be recycle. It is important to note that recycling from the County and FCPS Springfield Central Warehouse location was unable to be sorted due to unavailability of material.

Table 15. Recycling Audit Results for Operations/Maintenance Locations (% by Volume)*

Material Type	Department of Vehicle Services Alban Maintenance Facility
Cardboard	95%
Other Recyclable Paper	0%
Recyclable Plastic Containers	0%
Other Recyclable Containers	0%
Other Potential Recyclables	0%
Non-Recyclables	5%
Total	100%

Note:

*No recycling sorting occurred at the County and FCPS Springfield Central Warehouse.

Very little of the Department of Vehicle Services Alban Maintenance Facility recycling stream had non-recyclable contamination, which consisted of a plastic bucket, windshield wipers, and paper rags stained with oil. Cardboard was the major recyclable material found.

Results Summary

The averages from each of the sampled location types were weighted for both waste and recycling streams based on the number of locations sorted for each County location type. This generated overall weighted averages for each material type within each current stream.

7.3 Overall Waste

The overall weighted average results (in percent by volume) of the waste audits for all location types are shown in Table 16.

Table 16. Weighted Average Waste Audit Results for All Locations (% by Volume)

	Administratio n/Office	Public Safety	Park Authority*	Public Places*	Schools	Social Services	Operations/ Maintenance*	Total
No. of Locations Sorted (out of 20)	1	3	4	3	5	1	2	19
Material Type	Averages (%)							Weighted AVG (%)
Garbage	60%	42%	49%	30%	29%	40%	43%	39%
Edible/Recoverable Food	5%	0%	4%	3%	18%	0%	8%	7%
Other Compostables	5%	33%	21%	46%	30%	25%	18%	28%
Cardboard	5%	0%	0%	2%	0%	0%	15%	2%
Other Recyclable Paper	0%	8%	5%	13%	17%	15%	8%	11%
Recyclable Plastic Containers	20%	12%	13%	3%	3%	15%	10%	9%
Other Recyclable Containers	5%	3%	9%	2%	3%	5%	0%	4%
Other Potential Recyclables	0%	2%	0%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	0%	2%	0%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Notes:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**No waste sorting occurred at the Gatehouse (FCPS).

The most divertable material found in the waste stream was other compostables. The second and third most divertable materials were recyclable plastic containers and other recyclable paper, respectively. It is promising to see that approximately 39 percent of the entire waste stream consists of currently defined garbage materials. The major materials found in garbage were plastic film (e.g., garbage bag and food wrappers), Styrofoam, single-use plastic cutlery, both paper and plastic (e.g., PET #1 or PP #5) contaminated food containers, and rigid plastic. In order to achieve Zero Waste, or close to it, diversion options for these materials or legislation that bans the use of these materials will need to be established.

7.4 County Facility Waste Audit Results

The County facilities analyzed included one administration/office building, three public safety buildings, four parks under the jurisdiction of the FCPA, three public places, one social services building, and two operations/maintenance buildings. The results (by volume) of the visual waste audits of these County facilities are summarized in Table 17. The overall averages were weighted based on number of locations sorted for each County facility type.

Table 17. Weighted Average Waste Audit Results for County Facility Locations (% by Volume)

	Administration/ Office	Public Safety	Park Authority*	Public Places*	Social Services	Operations/ Maintenance*	Total
No. of Locations Sorted (out of 15)	1	3	4	3	1	2	14
Material Type	Averages (%)						Weighted AVG (%)
Garbage	60%	42%	49%	30%	40%	43%	43%
Edible/Recoverable Food	5%	0%	4%	3%	0%	8%	3%
Other Compostables	5%	33%	21%	46%	25%	18%	28%
Cardboard	5%	0%	0%	2%	0%	15%	3%
Other Recyclable Paper	0%	8%	5%	13%	15%	8%	8%
Recyclable Plastic Containers	20%	12%	13%	3%	15%	10%	11%
Other Recyclable Containers	5%	3%	9%	2%	5%	0%	4%
Other Potential Recyclables	0%	2%	0%	0%	0%	0%	0%
Other Potential Reusables	0%	0%	0%	2%	0%	0%	0%
Total	100%	100%	100%	100%	100%	100%	100%

Notes:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**No waste sorting occurred at the Gatehouse (FCPS).

The most divertable material found in the County facilities' waste stream was other compostables (e.g., low grade paper, unrecoverable food waste, etc.). The second and third most divertable materials were recyclable plastic containers and other recyclable paper, respectively.

7.5 Overall Recycling

The overall weighted average results (in percent by volume) of the recycling audits for all location types are shown in Table 18.

Table 18. Weighted Average Recycling Audit Results for All Locations (% by Volume)

	Admin/ Office	Public Safety	Park Authority *	Public Places	Schools*	Social Services	Operations/ Maintenance	Total
No. of Locations Sorted (out of 20)	2	3	3	2	4	1	1	16
Material Type	Averages (%)							Weighted AVG (%)
Cardboard	34%	57%	47%	32%	92%	95%	95%	62%
Other Recyclable Paper	6%	15%	8%	44%	3%	0%	0%	11%
Recyclable Plastic Containers	31%	7%	8%	0%	1%	3%	0%	7%
Other Recyclable Containers	3%	7%	3%	0%	2%	2%	0%	3%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%	0%
Non-Recyclables	26%	14%	33%	24%	3%	0%	5%	16%
Total	100%	100%	100%	100%	100%	100%	100%	100%

Notes:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**No recycling sorting occurred at the Green Springs Garden, Gum Springs Community Center, South Lakes High School, and the County and FCPS Springfield Central Warehouse.

It appears Fairfax County is doing a great job at recycling cardboard properly. Non-recyclables constituted a weighted average of approximately 16 percent (by volume). The main non-recyclables found in the recycling streams were plastic film, low-grade paper, single-use plastic cutlery, food waste, Styrofoam, and shredded paper. Only some glass was found in the recycling stream which could imply the separate purple bin glass collection is working. More education and proper signage are likely the solutions to improving the recycling stream.

1.1.1 County Facility Recycling Audit Results

Recycling audits were conducted at 12 County facilities (three facilities were not included due to either restricted access to the dumpsters or no sample being present). The results (by volume) of the visual recycling audits of these County facilities are summarized in Table 19. The overall averages were weighted based on number of locations sorted for each County facility type.

Table 19. Weighted Average Recycling Audit Results for County Facility Locations (% by volume)

	Admin/ Office	Public Safety	Park Authority*	Public Places	Social Services	Operations/ Maintenance	Total
No. of Locations Sorted (out of 15)	2	3	3	2	1	1	12
Material Type	Averages (%)						Weighted AVG (%)
Cardboard	34%	57%	47%	32%	95%	95%	53%
Other Recyclable Paper	6%	15%	8%	44%	0%	0%	14%
Recyclable Plastic Containers	31%	7%	8%	0%	3%	0%	9%
Other Recyclable Containers	3%	7%	3%	0%	2%	0%	3%
Other Potential Recyclables	0%	0%	0%	0%	0%	0%	0%
Non-Recyclables	26%	14%	33%	24%	0%	5%	21%
Total	100%	100%	100%	100%	100%	100%	100%

Notes:

*Columns may not appear to calculate correctly due to rounding. Percentages are by volume.

**No recycling sorting occurred at the Green Springs Garden, Gum Springs Community Center, and the County and FCPS Springfield Central Warehouse.

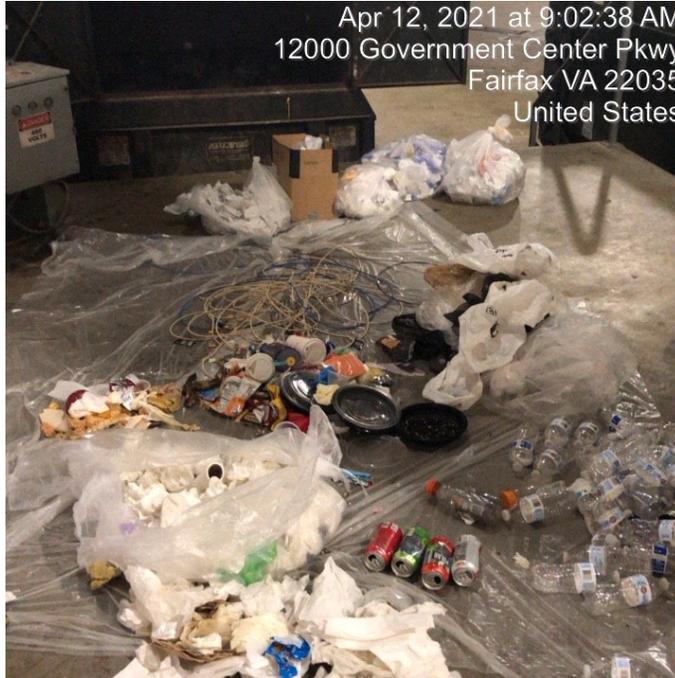
The majority (by volume) of County facility recycling was made up of cardboard, followed by non-recyclables and then other recyclable paper. Some of the main non-recyclables found in the recycling stream were plastic film, Styrofoam, low-grade paper, some C&D, shredded paper, food waste containers and single-use plastic service ware.

A photo log of the audits taking place at different locations can be found in Appendix A

Appendix A

Admin/Office Location: Fairfax County Government Center Building

Waste

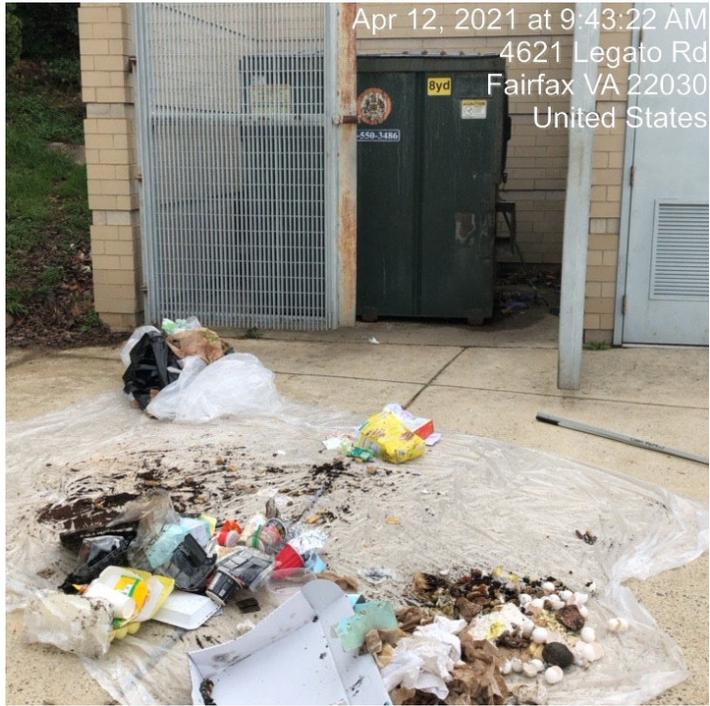


Admin/Office Location: Fairfax County Government Center Building

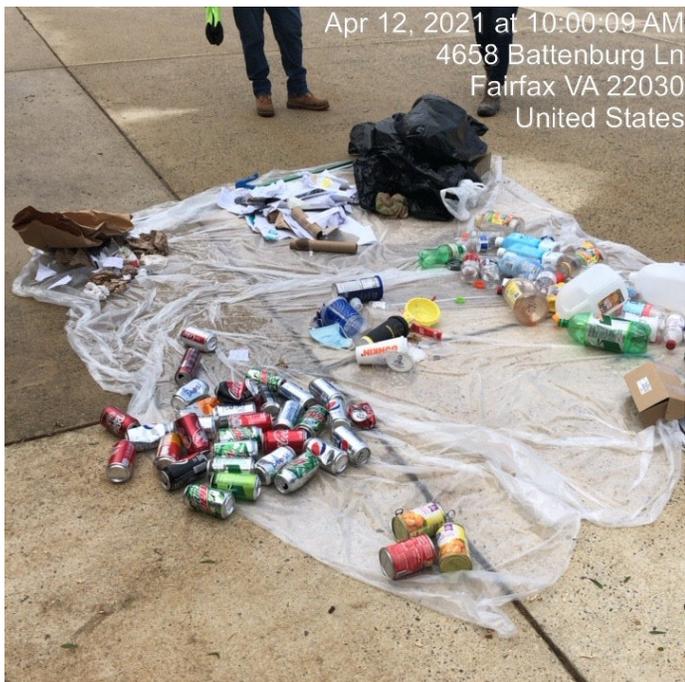
Recycling



Public Safety Location: Fairfax Center Fire Station 40
Waste



Public Safety Location: Fairfax Center Fire Station 40
Recycling



Park Authority: Audrey Moore RECenter
Waste



Park Authority: Audrey Moore RECenter
Recycling



**Public Place Location: Fairfax County Circuit Court
Waste**



Cafeteria Waste



**Public Place Location: Fairfax County Circuit Court
Recycling**



**Public Place Location: Reston Regional Library
Compost Pilot Program (Organics Collection)**



Compost Pilot Program (Organics Collection)



Schools: Terraset Elementary School
Waste



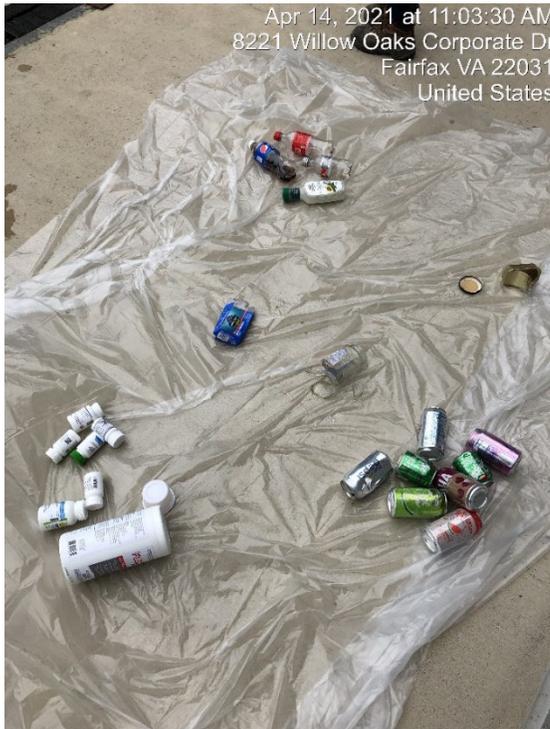
Recycling



Social Services: Fairfax-Falls Church Community Services Board (Merrifield Center)
Waste



Recycling

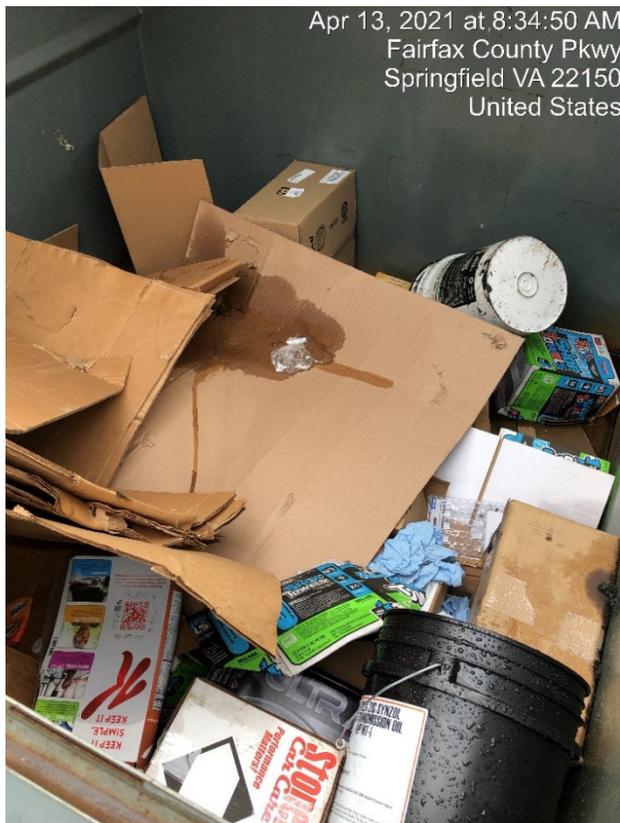


**Operations/Maintenance Location: Department of Vehicle Services – Alban
Maintenance Facility**

Waste



Recycling





Appendix D Fairfax County Zero Waste Employee Survey

Fairfax County Solid Waste Management Program

Fairfax County, Virginia

September 14, 2021





Contents

1	Introduction	2
2	Organization and Role	2
3	Attitudes Toward Waste Reduction	3
4	Opportunities to Reduce Waste	4
5	Facility Accommodations	6
6	Communication Sources	7
7	Additional Input	7

1 Introduction

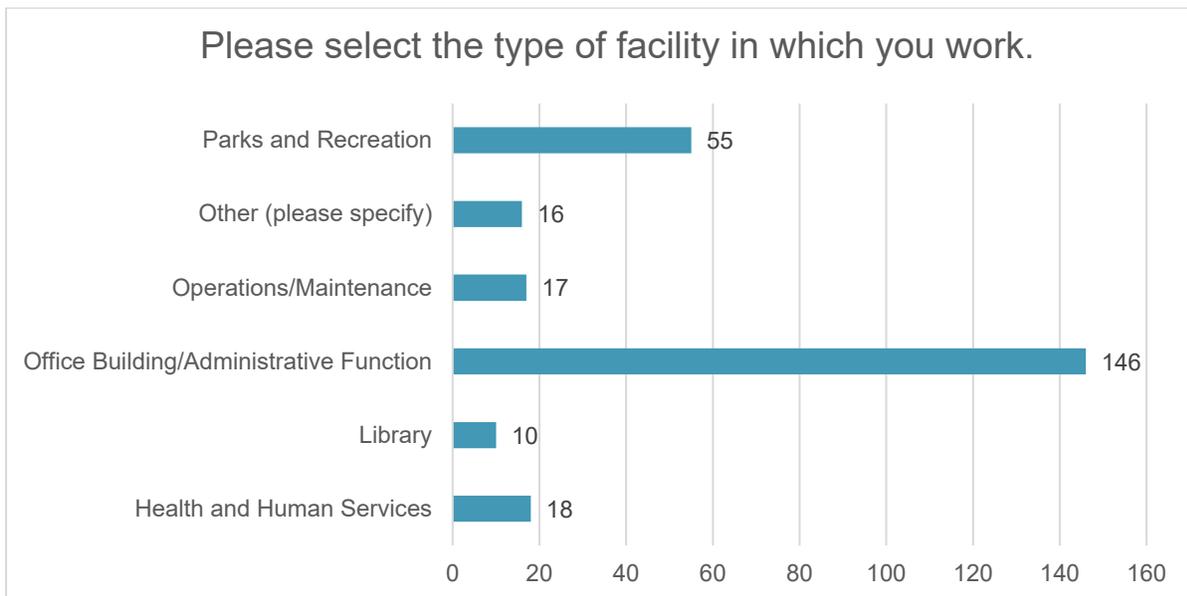
As part of its plan to achieve Zero Waste throughout all Fairfax County municipal buildings and schools, the Fairfax County Solid Waste Management Program surveyed employees of the County, the school system, the Park Authority and other municipal facilities to gain input on current conditions (prior to COVID-19 restrictions) and viable solutions. The Fairfax County Solid Waste Management Program team will evaluate the information as it develops strategies to increase waste reduction, reuse of materials, and recycling in Fairfax County municipal buildings.

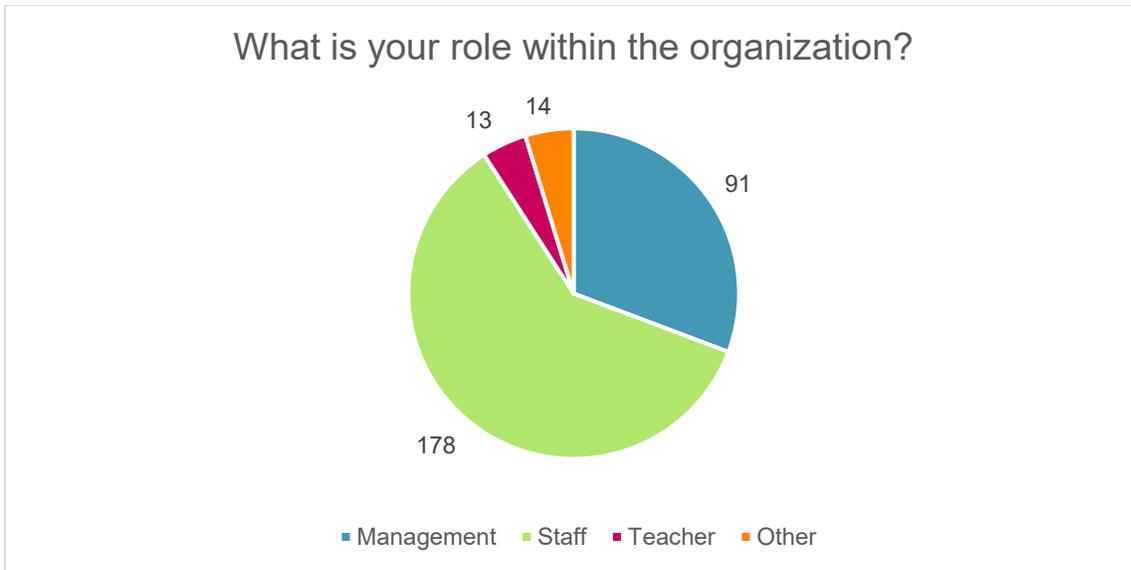
The survey was launched on May 17, 2021 and received nearly 300 responses. Below is a summary of the survey results, which suggest employees would welcome and commit to the County's Zero Waste effort. Increased education about Zero Waste, coupled with expanded accommodations for waste reduction and recycling, would facilitate employee actions to meet the Zero Waste goal.

The list of all survey questions and responses is in Appendix 1.

2 Organization and Role

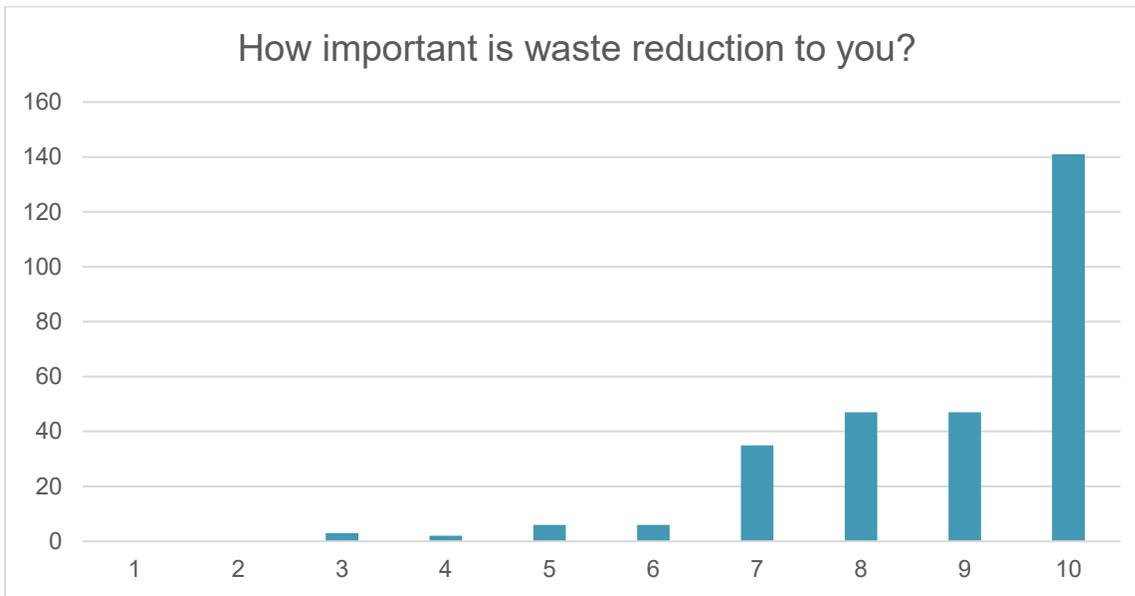
Below is a summary of the facility location of the survey respondents. The large majority of employees who responded work in an office or administrative building. Other work locations included the wastewater treatment plant, the Fairfax County Courthouse, construction sites, and food service sites. The majority of respondents are in a staff position within their organization. Other employee roles included custodian, administrative assistant, operator, and ecologist.

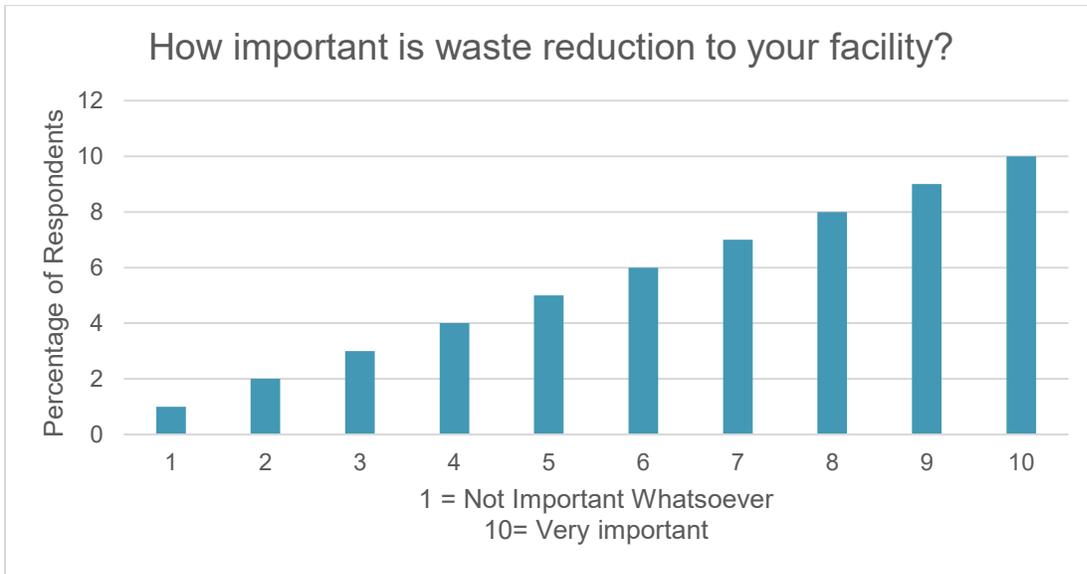




3 Attitudes Toward Waste Reduction

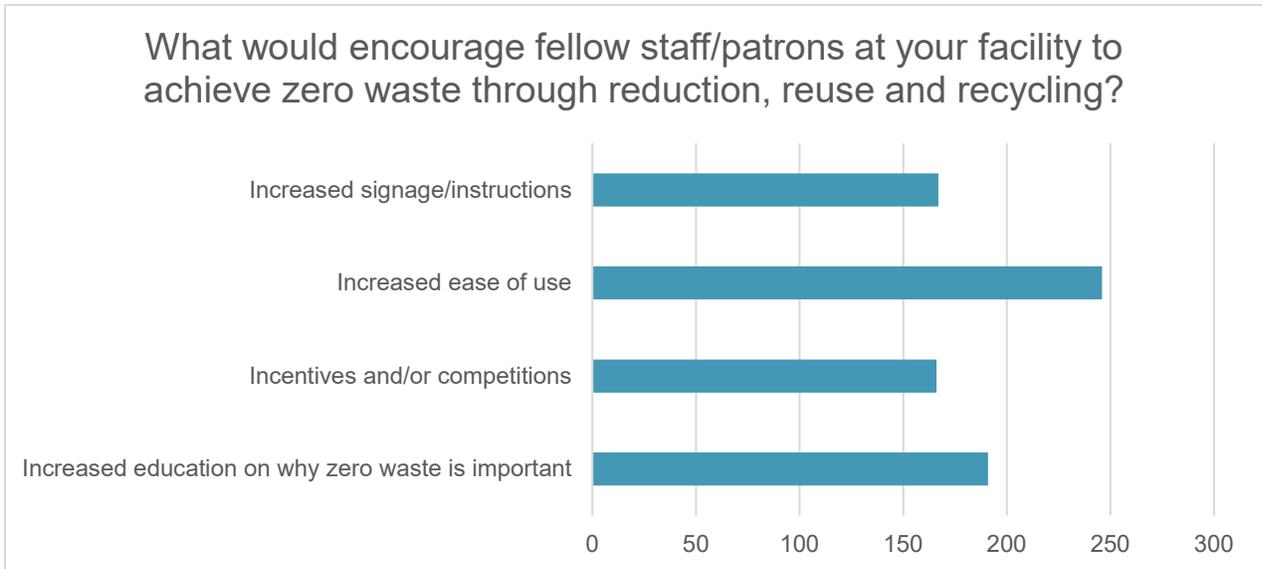
Though most employees described waste reduction as “very important” personally, their responses suggested their work locations may place varying levels of importance on waste reduction.





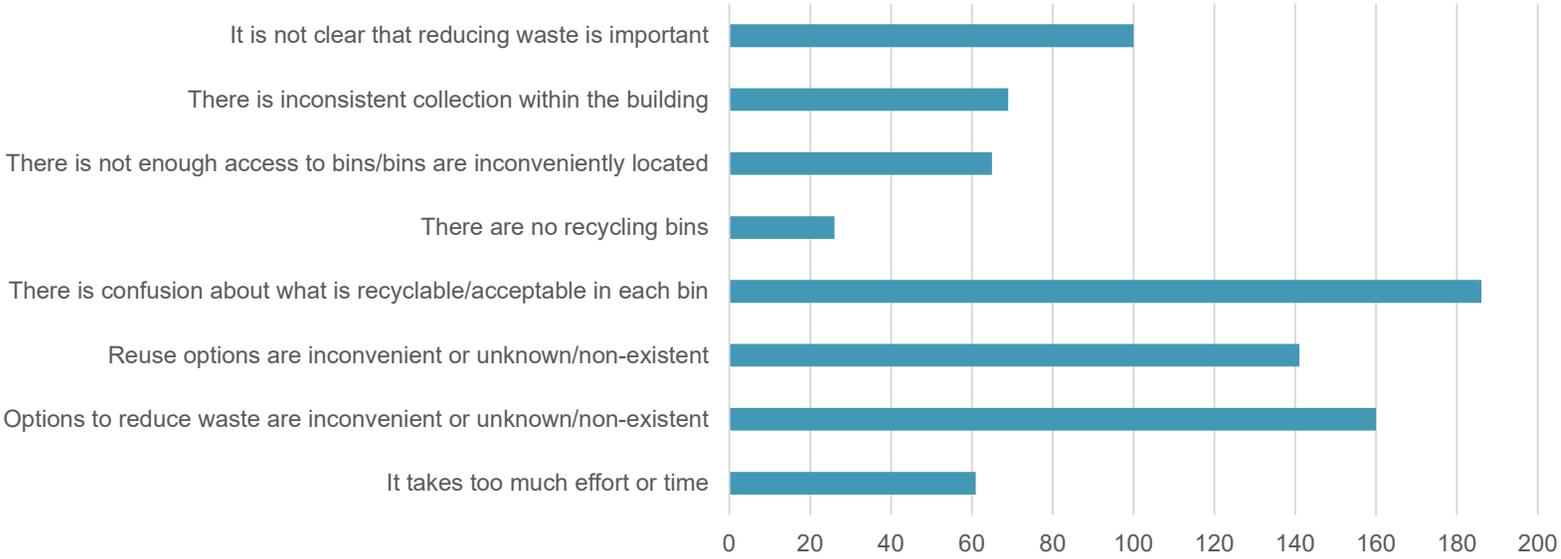
4 Opportunities to Reduce Waste

Employees identified the top drivers to achieve Zero Waste as an increased ease of use and further education. Present conditions, such as a lack of compost bins and a lack of training on disposal methods hinder waste reduction and/or recycling and reuse. Employees also noted that Zero Waste initiatives must have budgetary/financial support to be successful.



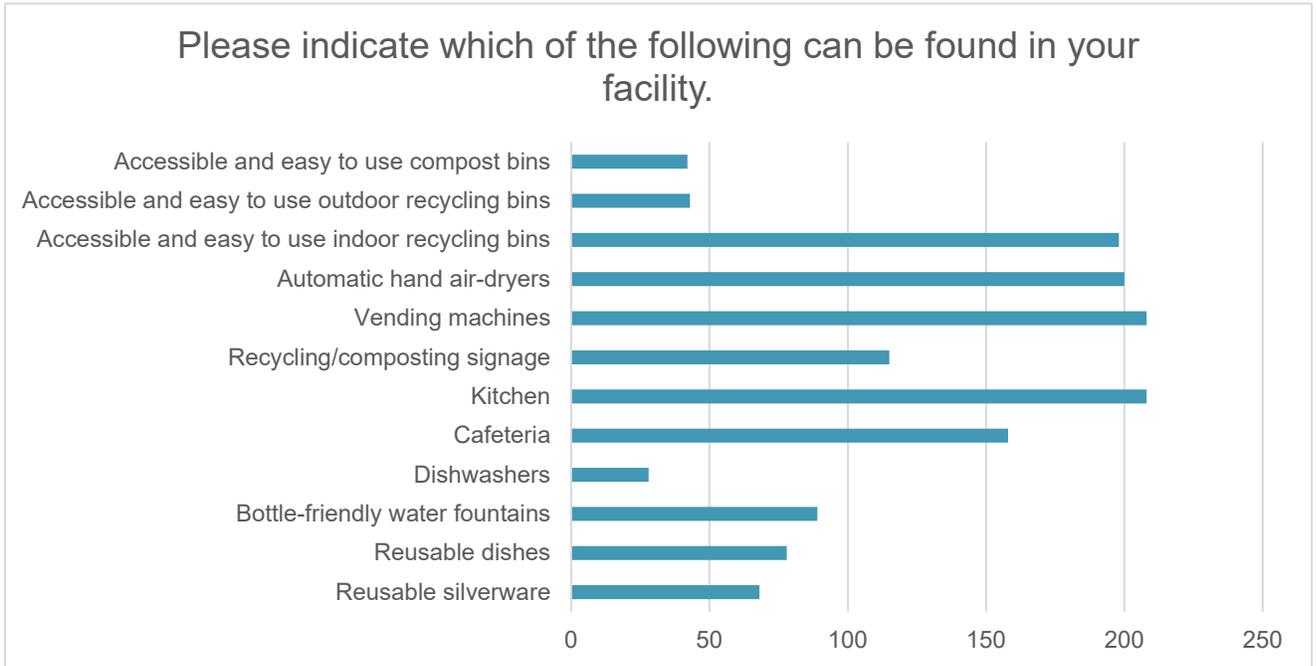


What are some things that prevent you/your facility from reducing waste or reusing/recycling items?



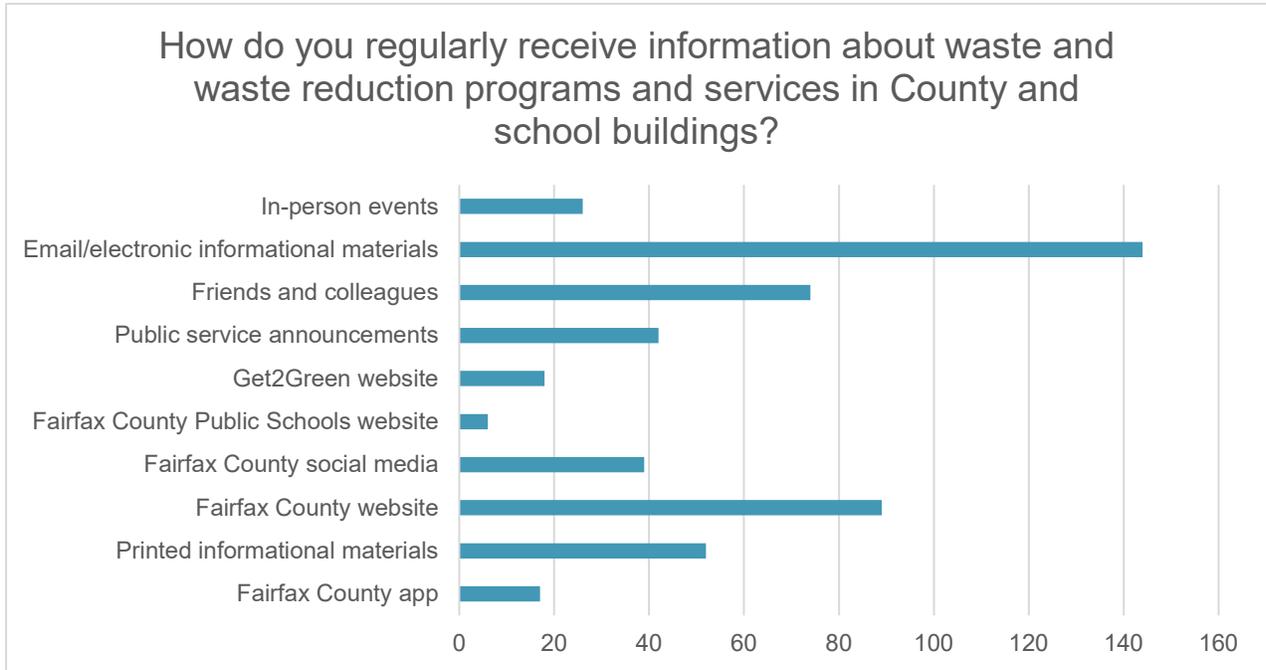
5 Facility Accommodations

Most employees reported accessible, easy-to-use recycling bins at their facilities, and noted better recycling signage and guidance would help individual facilities achieve Zero Waste. Some employees suggested implementing a more frequent pickup schedule and installing dishwashers and automatic hand dryers as ways to reduce waste.



6 Communication Sources

The survey results show that employees overwhelmingly receive information through email and/or the Fairfax County website. Employees also listed friends, colleagues, and affinity groups as information sources.



7 Additional Input

Employees provided additional suggestions for achieving Zero Waste, which included mandatory recycling and Zero Waste training, banning single-use items, and implementing electronic receipts. Employees noted that teleworking significantly reduced office waste, and that the shift to Zero Waste must be a cultural change and not just a matter of policy.

The survey results strongly suggest Fairfax County's Zero Waste effort aligns with employees' interests and motivations. Employee responses show a desire to learn and willingness to participate in activities that would help achieve the County's Zero Waste goal. By emphasizing employee education and engagement, Fairfax County is well-positioned to implement its plan.

Appendix 1: Survey Questions

Fairfax County Zero Waste Plan

Facility Survey

Fairfax County is currently developing a plan to achieve Zero Waste throughout all municipal buildings, parks, and schools. Zero Waste is a “philosophy, commitment, and design principle seeking to minimize waste to close to nothing”. Your input and ideas will be valuable as we assess how to reduce waste, reuse materials, and increase recycling.

Please select answers that apply to your pre-COVID work site.

1. Please select the type of facility in which you work.

- | | |
|---|---|
| <input type="radio"/> Office Building/Administrative Function | <input type="radio"/> Health and Human Services |
| <input type="radio"/> Public Safety | <input type="radio"/> Operations/Maintenance |
| <input type="radio"/> Parks and Recreation | <input type="radio"/> Elementary School |
| <input type="radio"/> Library | <input type="radio"/> Middle School |
| <input type="radio"/> Community Center | <input type="radio"/> High School |
| <input type="radio"/> Transit Center | <input type="radio"/> School Center |
| | <input type="radio"/> Other |

2. Please select your role within your organization:

- Management
- Staff
- Teacher
- Other (please specify) _____

3. How important is waste reduction to your facility? Please rank on a scale of 1-10 (1-not important whatsoever, 10-very important)



4. How important is waste reduction to you? Please rank on a scale of 1-10 (1- not important whatsoever, 10-very important)



5. What would encourage fellow staff/patrons at your facility to achieve Zero Waste through reduction, reuse, and recycling? Please select all that apply.

- Increased education on why Zero Waste is important
- Incentives and/or competitions
- Increased ease of use
- Increased signage/instructions
- Other (please specify) _____

6. What are some things that prevent you/your facility from reducing waste or reusing/recycling items? Please select all that apply.

- It takes too much effort or time
- Options to reduce waste are inconvenient or unknown/non-existent
- Reuse options are inconvenient or unknown/non-existent
- There is confusion about what is recyclable/acceptable in each bin
- There are no recycling bins
- There is not enough access to bins/bins are inconveniently located
- There is inconsistent collection within the building
- It is not clear that reducing waste is important
- Other (please specify)

7. Please indicate which of the following can be found in your facility. Select all that apply.

- Reusable silverware
- Reusable dishes
- Bottle-friendly water fountains
- Dishwashers
- Cafeteria
- Kitchen
- Recycling/composting signage
- Vending machines
- Automatic hand air-dryers
- Accessible and easy to use indoor recycling bins
- Accessible and easy to use outdoor recycling bins
- Accessible and easy to use compost bins

Other waste-generating or waste-reducing amenities

8. What would help your facility achieve Zero Waste? Please select all that apply. Requirements for printing/paper use

- Better signage or guidance for acceptable materials/recyclables
- Increased education on recycling/diversion
- More and easier to use bins for recycling
- More and easier to use bins for composting
- More information on ways to reduce materials/waste or reuse materials
- Procurement of reusable goods
- Installation of bottle-friendly water fountains
- Installation of automatic hand-dryers
- Other (please specify) _____

9. How do you regularly receive information about waste and waste reduction programs and services in County and school buildings? Please select all that apply.

- Fairfax County app
- Printed informational materials
- Fairfax County website
- Fairfax County social media
- Fairfax County Public Schools website
- Get2Green website
- Public service announcements
- Friends and colleagues
- Email/electronic informational materials
- In-person events
- Other (please specify) _____

10. Please provide any other suggestions you may have for achieving Zero Waste. If there are any beneficial Zero Waste measures that have been instituted in light of COVID, please share them here:

11. Thanks for the feedback! If you are interested in helping advance Zero Waste at your facility – or would like to be entered in a Zero Waste prize giveaway, please provide your contact information below (optional).

Name:

Email:

Please provide your department and facility name (optional).

For more information, please email recycling@fairfaxcounty.gov.

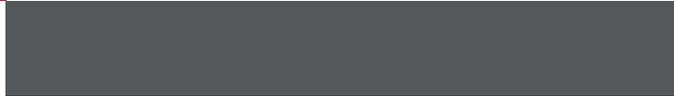


Appendix E

Literature Search

Zero Waste Plan Development

Fairfax, VA
September 14, 2021





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Contents

- 1. Introduction 1
- 2. Selection of Communities/Parks and Metrics..... 1
- 3. Zero Waste Goals..... 2
- 4. Population and Demographics 3
- 5. Waste Generation..... 6
- 6. Waste Reduction and Diversion Goals..... 7
- 7. Waste Reduction and Diversion Programs 9
- 8. Recycling and Diversion Rates 19
- 9. Waste Composition..... 20
- 10. Legislation and/or Regulatory Requirements 25
- 11. Parks..... 28
- 12. Summary..... 42

Tables

Table 4-1 Comparison of Population and Demographics.....	5
Table 4-2: Comparison of Population (Government and Schools).....	6
Table 5-1 Comparison of Generated Waste.....	7
Table 6-1: Waste Reduction and Diversion Goals	9
Table 7-1 Waste Reduction and Diversion Programs	10
Table 8-1: Minneapolis Waste Overview	19
Table 8-2 Philadelphia Reported Department Diversion Rates	20
Table 9-1. Waste Characterization Study Results per Community	23
Table 10-1: Tipping Fee By-Law Surcharge Fees.....	26
Table 11-1: Pricing List for Purchasable Compostable Dinnerware for use at Zero Waste Events within the Three Rivers Park District.....	29
Table 11-2: National Park Zero Landfill Initiative Assessment.....	35
Table 11-3: Matrix for Suggested MPRB Waste Diversion Strategies.....	41

Figures

Figure 9-1: Municipal Buildings Recycling Challenges (Philadelphia)	22
Figure 9-2: Additional Materials to Divert (Philadelphia)	22
Figure 11-1: Results of the Subaru and NPCA 2015 Baseline Waste Audit for Three National Parks (Grand Teton, Denali and Yosemite)	31

ACRONYMS AND ABBREVIATIONS

BPI	Biodegradable Products Institute
C&D	Construction and Demolition
DPMM	Department of Purchasing and Materials Management
EPR	Extended Producer Responsibility
EPS	Expanded Polystyrene
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
FMD	Facilities Management Department
HERC	Hennepin Energy Recovery Center
FSC	Forest Stewardship Council
JET	Joint Environmental Task Force
MPRB	Minneapolis Parks and Recreation Board
MSW	Municipal Solid Waste
NPCA	National Parks Conservation Association
NYC	New York City, New York
STREAM	Science, Technology, Recycling, Engineering, Arts, Math
Subaru	Subaru of America
SW&R	Solid Waste and Recycling (Minneapolis, MN)
SWMP	Fairfax County Solid Waste Management Program

1 Introduction

In late 2018, the Fairfax County Board of Supervisors instructed County staff to identify potential environmental collaboration areas with Fairfax County Public Schools (FCPS). As a result of that effort, the County established the Joint Environmental Task Force (JET), comprised of County and School staff and community partners to proactively and equitably address climate change and environmental sustainability. In 2019, the JET worked to establish its mission and develop focus areas for further development by subcommittees for energy, transportation, waste management, recycling, and workforce development.

HDR has been retained by the Fairfax County Solid Waste Management Program (SWMP) to assist in providing technical support to its staff and others from the Department of Purchasing and Materials Management (DPMM), FCPS, Fairfax County Park Authority (FCPA), and the Facilities Management Department (FMD) for the development of a Zero Waste Plan.

The Literature Search is the first in a series of Interim Task reports developed in support of the project. The purpose of this report is to compare waste management programs and services in Fairfax County to those in five similar communities located in the United States and Canada. In particular, the effort focused on waste management programs in schools, government-owned buildings, and parks.

2 Selection of Communities/Parks and Metrics

There are many jurisdictions in North America that have innovative features as part of their waste management programs and services, and how these are delivered. The intent of this benchmarking exercise was to select five communities that have some similarities to Fairfax County and that have implemented some best practices that may be of interest to the County.

Five jurisdictions/communities were selected with input from Fairfax County to support this project. The communities selected include Montgomery, Maryland (MD), Vancouver, British Columbia (BC), Canada (CA), Minneapolis, Minnesota (MN), Philadelphia, Pennsylvania (PA), Nashville, Tennessee (TN) and specifically the public school system in New York City, New York (NY).

While there are many aspects of programs that could be assessed, the following metrics were chosen in consultation with the County for benchmarking.

- Population and demographic information
- Waste reduction and diversion goals
- Definition of Zero Waste
- County/City government staff size and waste generation
- Schools' population and waste generation

- Recycling, diversion and generation rates
- Waste Composition
- Legislation and/or regulatory Requirements

The aforementioned communities, with the exception of Minneapolis, MN, do not focus on waste diversion efforts in public parks. In Section 11, five different case study examples of Zero Waste initiatives and/or waste diversion programs for different jurisdictional parks across the country were analyzed.

3 Zero Waste Goals

The term “Zero Waste”, has been adopted by many communities to improve their solid waste management programs. Fairfax County has defined Zero Waste as “philosophy, commitment, and design principle seeking to minimize waste to close to nothing.” Each of the of the communities in this report have formally stated their perspective of what Zero Waste means to them.

- Montgomery, MD: Montgomery County’s “Aiming for Zero Waste” report characterizes Zero Waste as a comprehensive strategy to increase and improve diversion and recycling¹. The County had a 70% recycling rate goal by 2020 which was not met.
- Vancouver, BC, CA: Vancouver’s “Zero Waste 2040” plan is a strategic plan focused on achieving Zero Waste by 2040. The City characterizes Zero Waste as no longer relying on landfill or incineration for disposal.
- Minneapolis, MN: Minneapolis’s “Zero Waste Plan²” sets waste reduction and diversion goals. The City characterizes Zero Waste as achieving a 0% growth rate in the total waste stream compared to 2010 levels. To achieve this, in June 2015, the City established a Zero Waste goal to recycle and compost 50 percent of its overall waste stream by 2020 and 80 percent by 2030.
- Philadelphia, PA: Philadelphia’s “Zero Waste & Litter Cabinet Action Plan³” is geared towards eliminating the use of landfills and conventional incinerators by 2035. The City characterizes Zero Waste as increasing waste diversion by 90% and utilizing the remaining 10% as waste to energy.
- Nashville, TN: Nashville’s “Solid Waste Master Plan: Achieving Zero Waste⁴” characterizes Zero Waste as moving from disposing of waste to managing waste as a resource. The City’s plan is aimed at achieving Zero Waste over the next 30

¹ <https://www.montgomerycountymd.gov/SWS/Resources/Files/master-plan/baseline-review-current-state-assessment-executive-summary.pdf>

² <https://www.minneapolismn.gov/media/-www-content-assets/documents/SWR---Mpls-Zero-Waste-Plan.pdf>

³ https://cleanphl.org/wp-content/uploads/2017/07/Zero_Waste_and_Litter_Action_Plan.pdf

⁴ “Solid Waste Master Plan: Achieving Zero Waste”. Nashville, TN

years (by approximately 2050). Zero Waste is defined as 90% diversion from landfill disposal.

- New York, NY: New York City's "One New York: The Plan for a Strong and Just City⁵" strategic plan addresses the City's aim to make New York City healthier, happier and more sustainable by 2050, including a Zero Waste goal of sending no waste to landfills by 2030. One of the City's initiatives for Zero Waste focuses on schools (Pre-K to 12th grade).

4 Population and Demographics

The following sections provide an overview of the population and demographics of each community according to the US Census and Statistics Canada. The population of schools and government employees is also provided based on the focused subject of Fairfax's Zero Waste Plan.

4.1 Montgomery, MD

Montgomery, MD is ranked as the most populous county in Maryland, as well as one of the wealthiest in the United States. According to the U.S. Census, in 2020 there were about 1.05 million people, and it experienced an 8.5% growth since 2010. The County spans about 507 square miles, resulting in a population density of 1,978.2 persons per square mile.

4.2 Vancouver, BC, CA

Vancouver is a coastal city on the mainland of British Columbia, Canada with a population of approximately 675,000 (2017). It is the third largest city in Canada. Geographically, the City spans about 44 square miles. Since 2010, the City has had a 12.5% growth rate, consistently increasing 1% each year since 2016. The City has a population density of approximately 5,4000 persons per square kilometer (or 2,120 persons per square mile).

4.3 Minneapolis, MN

Minneapolis is the largest city in Minnesota, located in Hennepin County. It is the 46th largest city in the United States. Geographically, the City spans 58 square miles. The City's population is about 425,395 as of 2020 with a population density of 7,821 persons per square mile. The County's population grew by about 10% from 2000-2017.

4.4 Philadelphia, PA

Philadelphia is located in Southern Pennsylvania spanning approximately 141.7 square miles. It is the largest city in Pennsylvania and 6th largest city in the United States. The City's population from the 2020 Census was 1.58 million, with a growth rate of approximately 0.38% per year since 2010. The population density of the City is close to

⁵ <http://www.nyc.gov/html/onenyc/downloads/pdf/publications/OneNYC.pdf>

11,380 persons per square mile. In addition, Philadelphia has the 20th largest public-school system in the U.S.

4.5 Nashville, TN

Being the capital of Tennessee, Nashville is the second largest city in the state. Smaller than the other compared counties, currently Nashville has a population just over 678,000 in the 475.5 square miles of land. Rising in popularity, the population has grown 12.8% since 2010. The City's population density is approximately 1,300 persons per square mile.⁶

4.6 New York, NY

New York City located in New York State is made up of five boroughs and is the most densely populated city in the United States. New York City has a current population of approximately 8.4 million people and sits on 302.6 square miles of land. The population density is about 27,000 people per square mile and the population growth is 0.67% since 2010.⁷ New York City has a population of about 1.2 million students, teachers, and school staff.

4.7 Comparison of Population and Demographics

Table 4-1 provides a summary of the researched municipalities in relation to Fairfax County. Compared to other communities, Fairfax County has the second highest population, third highest geographic area, third highest population density, and highest median income. Demographic data is not fully reported in Table 4-1 to show an equivalent assessment across the six municipalities. In addition, Table 4-1 provides a comparison of government employees and school populations.

⁶ [Nashville, Tennessee Population 2021 \(Demographics, Maps, Graphs\) \(worldpopulationreview.com\)](https://worldpopulationreview.com/country-rankings/nashville-tennessee-population-2021)

⁷ [New York City, New York Population 2021 \(Demographics, Maps, Graphs\) \(worldpopulationreview.com\)](https://worldpopulationreview.com/country-rankings/new-york-city-new-york-population-2021)

Table 4-1 Comparison of Population and Demographics

	Fairfax, VA	Montgomery, MD	Vancouver, BC ⁸	Minneapolis, MN	Philadelphia, PA	Nashville, TN
Population	1,147,532	1,050,688	631,486	429,606	1,584,064	670,820
White (%)	64.7%	60.0%	46.2%	63.6%	40.7%	65.5%
Black/African American (%)	10.6%	20.1%	1%	19.2%	42.1%	27.4%
American Indian	0.5%	0.7%	2%	1.4%	0.4%	0.5
Asian (%)	20.1%	15.6%	47.1%	5.9%	7.2%	4.0%
Other (%)	4.0%	3.6%	3.7%	9.9%	9.6%	2.6%
Geographic Area (square miles)	390.97	491.25	44.4 114.97 (square km)	53.97	134.10	475.5
Population Density (people per square mile)	2,766.8	1,978.2	2,120 5,492 (people per square km)	7,088.3	11,379.5	1,265.4
Median Household Income (2019 dollars)	\$124,831	\$108,820	\$65,327 (CAD)	\$62,583	\$45,927	\$59,828

⁸ <https://worldpopulationreview.com/canadian-cities/vancouver-population>

Table 4-2: Comparison of Population (Government and Schools)

	Government Employees	Schools (Students and Staff)	Total
Fairfax, VA ⁹	12,000 ¹⁰	220,000	232,00
Montgomery, MD	10,000 ¹¹	184,810 ¹²	194,810
Vancouver, BC, CA	7,000 ¹³	59,000 ¹⁴	66,000
Minneapolis, MN	34,000 ¹⁵	39,300 ¹⁶	73,300
Philadelphia, PA	33,000 ¹⁷	221,300 ¹⁸	254,300
Nashville, TN	9,300 ¹⁹	95,000 ²⁰	104,300
New York, NY	-	1,115,000	1,115,000

5 Waste Generation

Fairfax County’s Zero Waste Plan is focused on reducing waste in government buildings, schools, and parks. Understanding the amount of waste generated in each community within schools and government buildings is necessary; however, tonnage for these sectors were not available. To accurately compare the waste generated in government buildings and schools for the purpose of this report, HDR assumed a government waste generation rate based on Montgomery County, Maryland’s Aiming for Zero Waste, Technical Memorandum #1 non-residential waste generation rate in 2017 (5.94 pounds/person/day). In addition, HDR assumed waste generation rates for schools using New York City’s Guide to Zero Waste from 2018 (0.4 pounds/person/day).

Table 5-1 presents the tons of waste generated by government employees, students, and education staff for each community on an annual basis.

⁹ Fairfax- Zero Waste Plan Request For Information Fairfax County Park Authority (excel)

¹⁰ <https://www.fairfaxcounty.gov/hr/about-us#:~:text=When%20you%20come%20to%20Fairfax,of%20the%20people%20we%20serve>

¹¹ [Montgomery County, MD Government \(MCG\) Careers. Accessed May 2021](#)

¹² <https://www.montgomeryschoolsmd.org/about/>

¹³ <https://dailyhive.com/vancouver/city-of-vancouver-layoffs-coronavirus-april-2020>

¹⁴ [Vancouver School Board. Accessed May 2021](#)

¹⁵ https://mn.gov/mmb/assets/mn-state-workforce-report-2015_tcm1059-154960.pdf

¹⁶ https://mpls.k12.mn.us/uploads/mps_budget_-_at_a_glance.pdf

¹⁷ <https://fred.stlouisfed.org/series/SMU42379649091000001SA>

¹⁸ <https://www.philasd.org/fast-facts/>

¹⁹ [Metro Nashville Human Resources Gender Breakdown by Department. Accessed May 2021](#)

²⁰ <https://www.niche.com/k12/d/metro-nashville-public-schools-tn/students/>

Table 5-1 Comparison of Generated Waste

County	Government (Tons/Year)	Schools (Students and Staff) (Tons/Year)	Total (Tons/YEAR)
	261 Working Days	180 School Days	
Fairfax County, VA	9,300	7,900	17,200
Montgomery, MD	7,750	6,630	14,380
Vancouver, BC, CA	5,500	2,100	7,600
Minneapolis, MN	26,400	1,400	27,800
Philadelphia, PA	25,600	8,000	33,600
Nashville, TN	7,200	3,400	10,400
New York, NY	-	40,000 ²¹	40,000

6 Waste Reduction and Diversion Goals

The waste reduction and diversion goals of the five jurisdictions are discussed in Table 6-1 which shows a timeline for each jurisdiction’s goals.

6.1 Montgomery, MD

Montgomery County recently developed their “Aiming for Zero Waste: A Vision for Sustainable Materials Management in Montgomery County” Plan. The County had a 70% recycling rate goal by 2020 which was not met. A new recycling and diversion goal was not identified; however, an aspirational goal to rank the highest in North American programs includes a 60% recovery rate for recycling and organics. The County’s plan states that success depends on awareness and education and changes in their processing capabilities which requires equipment and facility improvements.

6.2 Vancouver, BC, CA

The City of Vancouver aims to eliminate the disposal of solid waste to landfills and incinerators by 2040 to avoid the increasing strain on the waste system. The City estimates that the Vancouver Landfill may reach capacity in 2028²². Four major focus areas, based on material disposed, have been identified by the City to define further action plans. These include built environment (Construction & Demolition (C&D) materials), food and packaging, products and packaging, and residuals. The City believes a Zero Waste goal cannot be achieved alone, that active participation from other organizations, businesses, both within and beyond the borders, is necessary. The City is determined to have system-wide changes by acknowledging the benefits that come with waste reduction, economical, and environmental impacts.

²¹ <http://dsny.cityofnewyork.us/wp-content/uploads/2018/11/zero-waste-schools-guide-ZWSG.pdf>

²² [Vancouver Zero Waste Plan 2040](#)

6.3 Minneapolis, MN

Minneapolis has published a goal²³ to recycle and compost 50% of its city-wide waste by 2020 and 80% by 2030. The resolution also called to achieve zero-percent growth in the City's total waste stream from levels set in 2010. Specific strategies for commercial and institutional sectors are identified; however, specific goals for these sectors are not.

6.4 Philadelphia, PA

The Zero Waste Council is determined to fully eliminate the use of landfills and conventional incinerators by 2035 by reducing waste generation, increasing waste diversion by 90%, and utilizing the remaining 10% as waste-to-energy. Philadelphia is determined to be "Home of the Zero Waste Events" as Philadelphia is a popular city for marathons, concerts, etc.

The City does not have any specific goals for schools or businesses; however, the City's Zero Waste Partnership Program allows the City to collaborate with local businesses and organizations to achieve Zero Waste. The Zero Waste Partnership Program includes annual municipal waste audits that are optional for businesses to complete. In addition, the reporting of monthly diversion rates recognizes businesses as Zero Waste Partners. Feedback from businesses on recycling and waste diversion is encouraged in the program and recommendations have been provided by the City. The Council aims to grow the Zero Waste Partnership with many diverse organizations and businesses to become self-promoting as a prominent local certification.

6.5 Nashville, TN

The primary objective of Zero Waste is to minimize waste generation and maximize the diversion of materials from landfills by implementing sustainable solid waste management practices. Nashville's Zero Waste goal is defined as achieving a 90% diversion from landfills. Some of Nashville's focus areas include: increasing recycling, food waste reduction and recovery, and composting programs throughout Davidson County, adopting recycling and recovery programs targeted toward Nashville's growing C&D waste stream, and strengthening public education and outreach programs.

6.6 New York, NY

As a part of New York City's "One New York: The Plan for a Strong and Just City", New York City implemented a goal of Zero Waste in landfills by 2030²⁴. One initiative of the Zero Waste goal is to make all schools (K- Grade 12) Zero Waste. GrowNYC's Zero Waste Schools Program has worked with over 500 schools in creating effective recycling programs.

²³ (McDonnell, 2017)

²⁴ [One NYC](#)

Table 6-1: Waste Reduction and Diversion Goals

	2020	2030	2035	2040	2050
Fairfax County	-	JET: Zero Waste in Schools	-	-	-
Montgomery County	Recycle 70%	-	-	-	-
Vancouver	-	-	-	Zero Waste	-
Minneapolis	Recycle and Compost 5%	Recycle and Compost 80%	-	-	-
Philadelphia	-	-	90% Waste Diversion 10% Waste to Energy	-	-
Nashville	-	-	-	-	Zero Waste (Plan does not set hard date)
NYC Schools	-	-	-	-	Zero Waste in Schools

7 Waste Reduction and Diversion Programs

Waste reduction and diversion programs are important steps in the road to Zero Waste. The selected communities documented in this report have included programs in their Zero Waste plans to be considered and implemented. Table 7-1 identifies the programs implemented and/or discussed in each respective Zero Waste plan. Most of the community plans did not differentiate between residential programs and governmental or park programs. For the purpose of this report, HDR identified the programs that were applicable for implementation in schools, public places, and government offices. In addition, accountability and evaluation programs were also identified as they ensure programs are being used to stay on the road to Zero Waste. Programs from the chosen Zero Waste plans were omitted from being included in the table if they did not relate to Fairfax County's Zero Waste goals.

Table 7-1 Waste Reduction and Diversion Programs

County	Schools	Public Places	Government Offices	Accountability/Annual Evaluations
Montgomery, MD	<ul style="list-style-type: none"> • Education/Outreach • Composting • Recycling/Composting Events • Bottle Refill Stations • Reusable Food Serviceware • Grants • Green Procurement 	<ul style="list-style-type: none"> • Fix-It/Repair Clinics • Sharing Libraries • Bottle Refill Stations • Reusable Food Serviceware • Anti-Litter • Grants • Green Procurement 	<ul style="list-style-type: none"> • Mandatory Organics Collection Program • Bottle Refill Stations • Reusable Food Serviceware • Grants • Community Engagement • SORRT (Smart Organizations Reduce and Recycle Tons) Program • Partners-in-Recycling Program • Green Procurement 	<ul style="list-style-type: none"> • Businesses are required to submit an Annual Recycling Reports every year²⁵.

²⁵ <https://www.montgomerycountymd.gov/SWS/sorrt/annual-recycling-report.html>

County	Schools	Public Places	Government Offices	Accountability/Annual Evaluations
Vancouver, BC, CA	<ul style="list-style-type: none"> • System to rescue and redistribute wasted edible food. • Reduction and diversion of single-use packaging. • Zero Waste Place Workshops²⁶ • Zero Hero's and Clean Up Your Act • Worm Composting Workshops • Support public education strategies such as pilot programs, school competitions, landfill visits.) 	<ul style="list-style-type: none"> • Reduction and diversion of single-use packaging. • Ban on disposal of compostable organics as garbage. • Green Bin Program 	<ul style="list-style-type: none"> • System to rescue and redistribute wasted edible food. • Reduction and diversion of single-use packaging. • Ban on disposal of compostable organics as garbage²⁷. • Green Bin Program 	<ul style="list-style-type: none"> • N/A

²⁶ [Metro Vancouver. K-12 Resources, Solid Waste. Accessed May 2021](#)

²⁷ [Metro Vancouver. "About Food Scraps Recycling". Accessed May 2021](#)

County	Schools	Public Places	Government Offices	Accountability/Annual Evaluations
Minneapolis, MN	<ul style="list-style-type: none"> Recycling and organics collection Bin Signage Sale or donation of reusable items Bottle Refill Stations Waste reduction and diversion training for staff. Reusable Food Serviceware 	<ul style="list-style-type: none"> Sale or donation of reusable items Bottle Refill Stations Access to Bins 	<ul style="list-style-type: none"> Recycling and organics collection. Waste Awareness Sale or donation of reusable items Modify city's procurement policy to allow and encourage the purchase of second-hand goods. Bottle Refill Stations 	<ul style="list-style-type: none"> Hire a coordinator to track, monitor, and improve the City's Zero Waste programs. Require annual reporting of solid waste management and waste reduction and diversion methods. Conduct Regular Waste Sorts (~5 years)
Philadelphia, PA	<ul style="list-style-type: none"> Green Futures CleanFutures Program 	<ul style="list-style-type: none"> Waste Watchers 	<ul style="list-style-type: none"> Building Waste Audit Program Recycling Ambassador Program Zero Waste Partnership Program²⁸ 	<ul style="list-style-type: none"> Reporting of "Zero Waste Action Items" and monthly diversion rates.
Nashville, TN	<ul style="list-style-type: none"> Recycling Ordinances. Implement Food Scrap Ban to Landfills Enhanced Bins Introduction of new materials into recycling stream. Education Outreach and Partnerships 			<ul style="list-style-type: none"> Tracking System: Tonnage and program data collection system to monitor program performance and progress towards Zero Waste.

²⁸ <https://www.philadelphiastreet.com/recycling/zero-waste-partnership-program>



County	Schools	Public Places	Government Offices	Accountability/Annual Evaluations
New York, NY	<ul style="list-style-type: none"> • GrowNYC's Zero Waste Schools Program • Classroom and Cafeteria Best Practices • Cafeteria Sorting Competition • Educational resources for students and adults • Green Teams • Waste Advocate: Rusty • Waste Deep educational series (middle/high school). • Student and School Recognition Awards 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A 	<ul style="list-style-type: none"> • N/A

7.1 Montgomery, MD

The Montgomery County “Aiming for Zero Waste” Plan includes many program options and recommendations to reach the County’s goals. As discussed in Table 7-1, many programs have been identified that could be implemented in Fairfax County to achieve Zero Waste in schools, public places, and government offices.

Schools:

- Education and Outreach: Montgomery County has a Waste Reduction and Recycling Education in Public and Private Schools program in place to provide educational outreach to schools upon request. Teachers may also request technical support to develop waste curriculums.
- Composting: Develop and support community-scaled composting projects in schools and throughout the County.
- Installation of bottle refill stations throughout schools to discourage single-use water bottles.
- Ban the use of single-use serveware (plate, utensils, trays) or provide reusable serveware for cafeterias and teacher’s lunchrooms.
- Provide grants or other incentives to encourage waste reduction and recycling.
- Green Procurement: The County implemented a “green purchasing” which is the purchase of good to minimize environmental impacts. These include ENERGY STAR® printers and copiers, eco-friendly soap and cleaners, and paper that is 30% or higher post-consumer recycled paper.

Public Places:

- Fix-It/Repair Clinics: Establish or support fix-it/repair clinics with local organizations to reduce waste.
- Sharing Libraries: Support Reuse Events that allow residents to obtain used items in a convenient, structured way.
- Installation of bottle refill stations throughout public places to discourage single-use water bottles.
- Ban the use of single-use serveware (plate, utensils, trays) or provide reusable serveware in areas that service food.
- Provide grants or other incentives to encourage waste reduction and recycling.
- Anti-Litter: Encourage more recycling/trash containers in public places to divert more materials.
- Green Procurement.

Government Offices:

- Mandatory residential and commercial organics collection recovery program.
- Installation of bottle refill stations throughout government offices to discourage single-use water bottles.

- Ban the use of single-use serviceware (plate, utensils, trays) or provide reusable serviceware for cafeterias and areas that serve food.
- Provide grants or other incentives to encourage waste reduction and recycling.
- Community Engagement: Brochures, flyers, fact sheets, and videos are available to provide information on current programs and disposal options.
- The SORRT (Smart Organizations Reduce and Recycle Tons) program promotes and supports business recycling. Technical support and educational materials are available. A Business Recycling Regulation Handbook is also available to provide step-by-step guidance to organizations in starting, maintaining, and expanding recycling and waste reduction efforts
- Green Procurement.
- Partners-in-Recycling Program matches a successful recycling business (also serving as a mentor) with a similar type of business to exchange expertise and provide guidance on setting up and/or improving their recycling programs²⁹.

7.2 Vancouver, BC, CA

Vancouver's "Zero Waste 2040" Strategic Plan addresses ways to improve waste diversion in their four main focus areas: C&D materials, food and packaging, products and packaging, and residuals. Although specific to the four main focus area, several programs mentioned in Vancouver's plan could be implemented in Fairfax County to achieve Zero Waste in schools, public places, and government offices.

Schools:

- Develop a City by-law regulation supporting a system that could rescue and redistribute wasted edible food.
- Develop a City by-law regulation to reduce the amount and divert single-use items used. Consider reusable options.
- Educational Tools
 - Zero Waste Place Workshops: Free program to educate students on Zero Waste goals.
 - Zero Hero's and Clean Up Your Act: Environmentally-themed live shows for students.
 - Worm Composting Workshops: Workshops for students from K- Grade 5 on how to turn food scraps into compost using worms.

Public Places:

- Develop a City by-law regulation to reduce the amount and divert single-use items used. Consider reusable options.
- Ban on disposal of compostable organics as garbage.

²⁹ (Eileen Kao, 2018)

- The Green Bin program was introduced to tackle the organic waste solution by collecting food waste.

Government Offices:

- Develop a City by-law regulation supporting a system that could rescue and redistribute wasted edible food.
- Develop a City by-law regulation to reduce the amount and divert single-use items used. Consider reusable options.
- Ban on disposal of compostable organics as garbage.

7.3 Minneapolis, MN

The City of Minneapolis plans to achieve a zero percent growth rate in their total waste stream as compared to their 2010 waste generation rate. The implementation of specific programs within the institutional sector are challenging for the City based on the lack of authority to regulate solid waste and recycling activities. Nonetheless, the City's Zero Waste Plan includes strategies and programs specific to commercial and institutional waste which Fairfax could implement to reach their Zero Waste goals.

Schools:

- Require the collection of recycling and organics and support organics diversion programs. In addition, place recycling bins in all indoor and outdoor areas.
- Provide consistent signage on all recycling, organics, and waste bins.
- Encourage or require the sale or donation or reusable items before disposal. The City also has internal classified postings for the reuse of items among City departments.
- Installation of bottle refill stations throughout schools to discourage single-use water bottles.
- Encourage schools to develop waste reduction and diversion training for staff.
- Ban the use of single-use serviceware (plate, utensils, trays) or provide reusable serviceware for cafeterias and teacher's lunchrooms.

Public Places:

- Encourage or require the sale or donation or reusable items before disposal. The City also has internal classified postings for the reuse of items among City departments.
- Installation of bottle refill stations throughout public spaces to discourage single-use water bottles.
- Encourage all public spaces to have waste and recycling bins with proper signage.

Government Offices:

- Require the collection of recycling and organics and support organics diversion programs.

- Throughout City facilities, all desk-side garbage containers were removed, and a centralized waste collection system was implemented. Employees were provided with a “mini” waste container and recycling container and were responsible for transporting their waste to the central collection site within the office, making them more aware of their waste
- Encourage or require the sale or donation or reusable items before disposal. The City also has internal classified postings for the reuse of items among City departments.
- Modify the City’s procurement policy to allow and encourage the purchase of secondhand goods.
- Installation of bottle refill stations throughout government offices to discourage single-use water bottles.

7.4 Philadelphia, PA

In Philadelphia, multiple programs have been developed to help promote its Zero Waste goal. Below are some programs that the City has implemented or plans to implement to reach their Zero Waste goals. Philadelphia’s “The Litter Cabinet” has been a large factor in endorsing recycling and educating the community.

Schools:

- Green Futures is the School District of Philadelphia’s Sustainability Plan and it provides a tool kit to include single-stream recycling in schools.
- The CleanFutures Program encourages students to engage in litter reduction. This program is a competition between Philadelphia schools to see who can collect the most litter.

Public Places:

- The Waste Watchers program invites volunteers to help separate trash, recycling, and composting at the Philadelphia Marathon to increase recycling and introduce composting at large events in the City.

Government Offices:

- The Building Waste Audit Program encourages recycling and waste diversion.
- The Recycling Ambassador Program identifies and trains recycling ambassadors to educate building staff members on proper recycling.
- The Zero Waste Partnership Program includes annual municipal waste audits that are optional for businesses to complete. The reporting of monthly diversion rates recognizes businesses as Zero Waste Partners. Feedback from businesses on recycling and waste diversion is encouraged in the program and recommendations have been provided by the City. Partners are also eligible for Philadelphia Sustainable Business Tax Credit.

7.5 Nashville, TN

Nashville's "Solid Waste Master Plan: Achieving Zero Waste" plan includes several programs that could be implemented in Fairfax County to help achieve Zero Waste in schools, public places, and businesses. These include:

- Ordinances that require recycling plan, web information and hotlines, recognition programs, grants for bins, space for recycling bins and other initiatives.
- Implement a ban of food scraps from being included in regular trash.
- Enhanced recycling and trash bins to increase recycling.
- Introduction of new materials into the recycling stream that are currently not accepted at drop off locations. These would not be accepted in regular recycling collection but would be accepted in other locations.
- Education program to inform and encourage increase use of diversion alternatives. Different methods include radio, newspaper, newsletters, web, and social media. Partnerships with schools and businesses is necessary for effective outreach strategies.

7.6 New York, NY

New York City is aiming to reach Zero Waste in schools. GrowNYC's Zero Waste School Program is a program for schools that provides education in different areas about waste reduction depending on the grade. Over 500 schools have implemented GrowNYC to educate children on the importance of striving towards Zero Waste. The program also implements an organics collection at the schools recently to efficiently divert food scraps. Some of the programs being implemented into New York City's Zero Waste Schools plan include:

- Classroom and Cafeteria Best Practices: Library of documents on recycling and organics collection, setup and outreach, different presentations, videos, recycling decals, and more.
- Cafeteria Sorting Competition: Clickers are used to determine how many people in the cafeteria are recycling during a given period and can provide data on which grade had most participants and recycling the most. This can also be used to understand when students are correctly or incorrectly recycling.
- Educational Resources: Resources for both adults and students are available to help deepen ones understanding about recycling and waste reduction.
- Green Teams: Group formations to establish and promote sustainability and recycling efforts in schools.
- Waste Advocate: Rusty is New York City's animated Zero Waste Advocate. Videos with different lessons from Rusty are available for different grades.
- Waste Deep Educational Series: Waste Deep is specifically set up for middle and high school students. It is made up of five lessons to understand the economic, social, and environmental impact of waste in New York City.

- Student and School Recognition Awards: Recognition awards are provided to both schools and individuals to acknowledge programs in sustainability, reuse, gardening, and cleanups³⁰.

8 Recycling and Diversion Rates

The following sections provide an overview of the recycling and diversion rates in each community.

8.1 Montgomery, MD

In 2017, Montgomery County's overall recycling rate was 56% and the diversion rate was 65%. The recycling rate included more than 150,000 tons of ash, which if omitted reduced the recycling rate to 43%.

8.2 Vancouver, BC, CA

In 2018, it was reported that 2,317,050 total tons were recycled and diverted from disposal and around 88,100 tons of material were reused. Metro Vancouver estimated that the commercial recycling rate was near 46%, or approximately 337,000 tons. The estimated commercial waste was disposed was 397,021 tons.

8.3 Minneapolis, MN

The City's Division of Solid Waste and Recycling (SW&R) provides solid waste and recycling services to about 290,000 residents (in 106,000 dwelling units), about 200 parks, select City buildings and small commercial businesses with carted service. The City only reported waste diverted from residential services. In 2016, SW&R collected approximately 140,000 tons of material from residential services. The tonnages and percentages of this residential waste (which includes 200 commercial customers) are seen in Table 8-1.

Table 8-1: Minneapolis Waste Overview

Material	Tons	% of Waste
Recyclables	30,425	21.84
Yard Waste	17,630	12.66
Organics	3,385	2.43
C&D (Landfilled)	5,089	3.65
HERC	82,765	59.42

³⁰ <https://www1.nyc.gov/assets/dsny/site/our-work/zero-waste-schools>

The City defines diverted waste as material that is redirected from the waste stream, which includes all recycled and composted materials. In 2016, the City reported a recycling rate of 37%. Approximately 75% of the waste managed at Hennepin Energy Recovery Center (HERC) is generated by Minneapolis and approximately 11,400 tons of scrap metal is recovered (about 3% of waste processed)³¹.

8.4 Philadelphia, PA

The total estimated diversion rate in the City of Philadelphia has grown from 30.8% in 2007 to 41.6% in 2018. The estimated commercial diversion rate in 2018 was around 49.8%. While 804,133 tons of commercial MSW was disposed, 798,075 tons of commercial MSW was recycled. With the implemented waste audit program, the diversion rates of some departments were able to be determined.

Table 8-2 Philadelphia Reported Department Diversion Rates

Department	Average Diversion Rate
Water Department	61.3%
Fire Department	23%
Department of Public Property	20.5%

8.5 Nashville, TN

Out of the 1.2 million tons of waste generated in 2016, only 12% was recycled and only 6% composted. Private waste haulers collect the majority (80%) of the waste throughout the County, and in general do not have robust diversion programs.

8.6 New York, NY

New York City is aiming to send Zero Waste to landfills by 2030. New York City schools generate approximately 400,000 tons of waste a year. As an initiative to reach a city-wide Zero Waste goal, New York City is working to reach Zero Waste in schools K-Grade 12. Specific diversion rates have not been identified.

9 Waste Composition

The following section breaks down the commercial/industrial waste composition found in each community via recent waste characterization studies. Where speciation of materials was completed, the applicable breakdown is provided in Table 9-1.

³¹ <https://www.hennepin.us/your-government/facilities/hennepin-energy-recovery-center>

9.1 Montgomery, MD

Montgomery County conducted a waste composition study in FY 2016-2017. The waste composition study included taking 300 total samples (75 samples from each season). Of those 300 samples, 120 were from commercial waste. The commercial waste breakdown for Montgomery County is provided in Table 9-1.

9.2 Vancouver, BC, CA

The City of Vancouver conducted a waste composition study in 2020. The study was completed at five facilities in the Metro Vancouver Region. Waste was separated into single-family, multifamily, commercial/institutional, and small loads from the residential drop-offs. The waste breakdown provided in Table 9-1 include the commercial and institutional waste.

9.3 Minneapolis, MN

Minneapolis conducted a waste composition study in 2016 which included residential waste and commercial waste from the City's 200 commercial customers. The waste breakdown provided in Table 9-1 includes both residential and commercial waste.

9.4 Philadelphia, PA

In 2019, Philadelphia submitted a Municipal Building Waste Audit Report. Data provided for this report was a result of facility managers submitting an annual "Municipal Building Waste Audit" form for the year of 2018. Facility managers also have an opportunity to submit monthly waste generation totals. Facility managers who report these monthly totals are recognized as Zero Waste Partners in the City's Zero Waste Partnership Program. In 2018, 523 buildings were identified to participate, and 392 buildings submitted an annual waste audit form. Results from the audit is provided in Table 9-1.

The City of Philadelphia also included a questionnaire on the annual Municipal Building Waste Audit form to focus on challenges the City departments face when recycling and to identify materials they would like to divert from the trash. Figure 9-1 and Figure 9-2 provide the results of these two questions.

Figure 9-1: Municipal Buildings Recycling Challenges (Philadelphia)

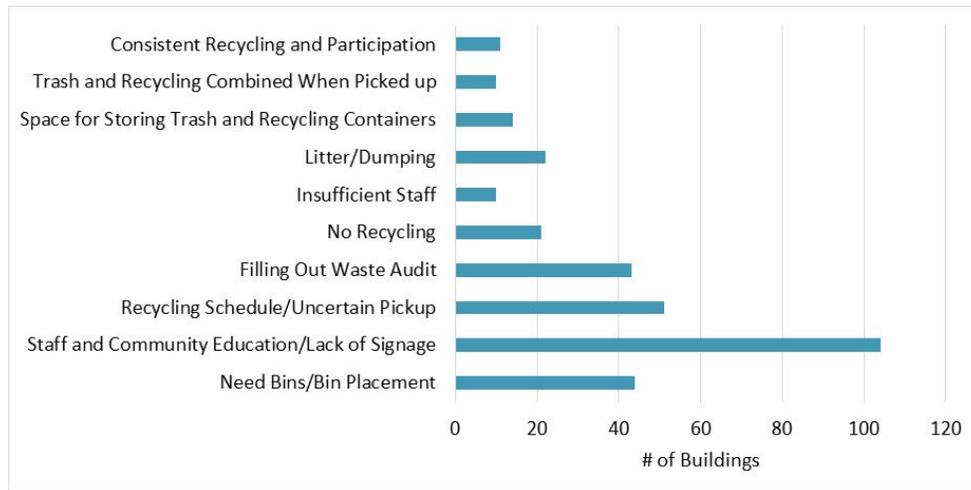
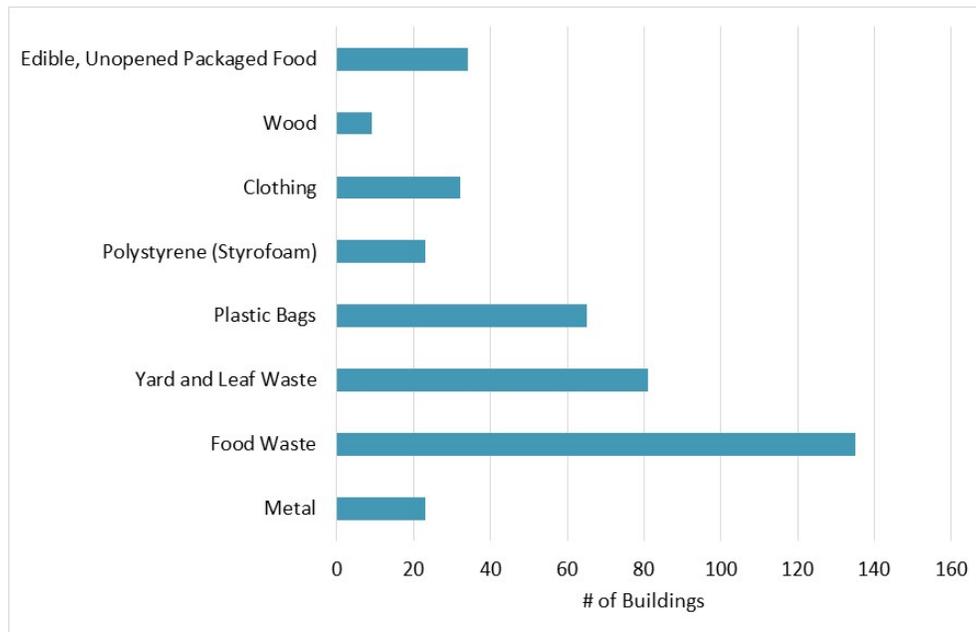


Figure 9-2: Additional Materials to Divert (Philadelphia)



9.5 Nashville, TN

In 2017, Nashville conducted a waste and recycling materials characterization study. This included two events (July 2017 and October 2017) over two-week periods. The first week included sampling MSW at two transfer stations and the second week included sampling of recyclables at a local material recovery facility (MRF). In total, 285 samples were collected and sorted in 50 categories. A breakdown of waste generated by the commercial sector can be seen in Table 9-1.

9.6 New York, NY

In 2017, New York City Schools conducted a waste characterization study. Table 9-1 shows a breakdown of the waste generated.

Table 9-1. Waste Characterization Study Results per Community

	Montgomery County, MD (2017)	Vancouver, CA (2020)	Minneapolis, MN (2016)	Philadelphia, PA (2018)	Nashville, TN (2017)	NYC Schools (2017)
Total Recyclables	43.3%	37.2%	21.8%	65.0%	52.7%	34.8%
Plastic	16.8%	14.9%	-	20.0%	16.9%	-
Metal	3.0%	5.1%	-	2.0%	3.0%	-
Ferrous	2.3%	-	-	-	-	-
Non-Ferrous	0.7%	-	-	-	-	-
Glass	1.3%	2.0%	-	3.0%	4.9%	-
Paper	22.2%	15.2%	-	40.0%	27.9%	21.2%
Total Metal/Glass, Plastic (MGP)	21.1%	22.0%	-	25.0%	24.8%	13.6%
Total Organic	43.5%	38.0%	15.1%	30.0%	18.5%	51.3%
Compostable Organics	-	21.6%	-	-	-	49.4%
Food	-	-	-	-	-	29.1%
Compostable Paper	-	-	-	-	-	20.4%
Non-compostable Organics	-	16.4%	-	-	-	-
Yard Waste	2.2%	-	12.7%	-	-	1.9%
Total C&D	9.9%	12.5%	3.7%	3.0%	14.6%	-
Wood	9.9%	-	-	-	-	-
Total HHW	<0.1%	8.9%	-	-	1.0%	-

	Montgomery County, MD (2017)	Vancouver, CA (2020)	Minneapolis, MN (2016)	Philadelphia, PA (2018)	Nashville, TN (2017)	NYC Schools (2017)
Electronics	-	2.4%	-	-	-	-
HHW	<0.1%	2.1%	-	-	1.0%	-
Household Hygiene	-	4.4%	-	-	-	-
Other	3.2%	3.3%	59.4%	2.0%	13.3%	13.9%
Textiles	-	-	-	-	5.0%	-
Bulky	-	2.8%	-	-	-	-
Fines	-	0.5%	-	-	-	-
Garbage	-	-	59.4%	-	-	-

10 Legislation and/or Regulatory Requirements

10.1 Montgomery, MD

Montgomery County has passed several executive regulations that focus on the collection, hauling, and transportation of waste, leaf vacuuming, and recycling. Recycling is mandatory for residential and commercial properties. As of May 2021, Montgomery County joined many other jurisdictions with the ban on single-use plastic straws. In addition, Bill 33-20 recently banned #6 plastics³².

In addition, regulatory approaches included in Montgomery County's Zero Waste Plan include:

- The ban of single-use plastic shopping bags;
- Expand ban on expanded polystyrene (EPS) food packing for retail sale and distribution; and
- Reduce single-use plastic water bottle.

10.2 Vancouver, BC, CA

Like many other jurisdictions, the Provincial Government developed Extended Producer Responsibility (EPR) programs for all plastics that provide incentives for alternatives to non-recyclable plastic. The Provincial Government also requires all plastic material sold in BC to have a material code identifying its composition to improve waste sorting. Improved waste sorting supports other by-laws that ban certain items from entering the waste stream at businesses and limit the recycling potential of materials at solid waste facilities. Approved by-laws for single-use items, ban the following materials³³ :

- Single-use plastic straws;
- Foam cups and foam take-out containers;
- Disposable utensils/cups (2022); and
- Shopping bags (2022).

The Tipping Fee Bylaw is an additional by-law that adds a surcharge fee, shown in Table 10-1, that is added if there is a certain amount of banned materials found in customers' garbage while being unloaded at solid waste facilities.

³² (The Clean Water Blog, 2020)

³³ (Single-Use Item Reduction Strategy, 2020)

Table 10-1: Tipping Fee By-Law Surcharge Fees

Materials	Surcharge Level	Applies to
Banned hazardous and operational impact Banned product stewardship program materials	\$65 minimum, plus the potential cost of removal, clean up or remediation	Loads containing one or more banned item(s). No threshold (any quantity)
Banned recyclable materials, except for expanded polystyrene packaging	50% of Tipping Fee surcharge payable	Loads containing 5% or more by weight or volume of one or a combination of recyclable materials. Loads containing 25% or more by weight or volume of food waste
Expanded polystyrene packaging	100% of Tipping Fee surcharge payable	Loads containing 20% or more by weight or volume

Since January 2015, food scraps separation has been mandatory for residents (including apartments, condos and detached homes) and businesses in Vancouver. Metro Vancouver placed a disposal ban on organic materials, such as food scraps, meaning food is banned as garbage at the region's waste facilities. The disposal ban is used as an enforcement tool that encourages recycling. The Organics Disposal Ban is enforced in the same as the region's other disposal bans. Waste is inspected when it is delivered to a regional disposal facility and if a waste load contains excessive amounts of food scraps, the hauler pays a surcharge of 50% on the cost of disposal.³⁴

10.3 Minneapolis, MN

The City Council passed the Green to Go Environmentally Acceptable Packaging Ordinance on April 22, 2015. Green to Go requires that food and beverage containers prepared for immediate consumption and 'to go' must be placed in environmentally acceptable packaging that is reusable, refillable, recyclable, or compostable. In 2016, the Council attempted to pass a bring your own bag ordinance to reduce single-use plastic bags, however, there was pushback from state lawmakers that barred this law from taking effect.

The City Ordinance Chapter 174.435 for commercial recycling services requires commercial and business property owners to offer recycling with the following requirements:

- Regular collection (at least twice per month);
- Adequate recycling containers in convenient locations;
- Written recycling information for tenants; and
- Written recycling plan must be provided.

³⁴ [About Food Scraps Recycling \(metrovancover.org\)](http://metrovancover.org)

10.4 Philadelphia, PA

The city of Philadelphia, in accordance with Executive Order 5-96, requires all municipal buildings to recycle. The City also made some attempts to ban certain materials from being distributed. After multiple attempts, in 2019, Philadelphia banned single-use plastic bags that will take effect in 2021. Additionally, any paper bags that do not contain at least 40% recycled content are prohibited for carryout, delivery, or groceries³⁵.

10.5 Nashville, TN

Through City ordinances, the City of Nashville banned the following materials from being accepted in the curbside recycling collection programs:

- Yard waste;
- Corrugated cardboard; and
- Electronic waste³⁶.

In addition, a food scrap landfill ban was discussed in the Zero Waste Plan and would have a major impact on the volume of waste going to a landfill.

As suggested in its Zero Waste Plan, the City believes recycling should be made mandatory for both residential and commercial sectors and recycling should be required at all construction sites with specifications stating responsibilities, enforcement, and escalating penalties. The ban, in addition to a food waste ban, was deemed necessary to move toward 75% diversion as they would provide the motivation to drive increased participation. It was estimated these bans would cause an additional 4% diversion in Davidson County.

With the intent to move towards Zero Waste, Nashville proposed an ordinance to prohibit retail establishments from providing single-use plastic carryout bags and straws to customers. With pushback from citizens, lawmakers in Nashville did not move forward with enacting the local bans on plastic grocery bags. However, the bill's Senate sponsor is proposing the ban to become a statewide Bill (Tennessee Senate Bill 2131) to improve the environmental quality after the Tennessee River has been recently noted as one of the most plastic-polluted waterways in the world³⁷.

10.6 New York, NY

The following local laws were established in New York City to help improve diversion efforts through mandatory recycling programs and voluntary organics collection programs:

³⁵ <https://www.phila.gov/2020-12-30-updated-timeline-for-implementation-of-plastic-bag-ban/>

³⁶ https://library.municode.com/TN/metro_government_of_nashville_and_davidson_county/codes/code_of_ordinances/219301?nodeId=CD_ORD_TIT10HESA_DIVIGERE_CH10.20WAMA_ARTIGERE_10.20.095YAWACOCAELWABASOWACO

³⁷ <https://www.kuaf.com/post/tn-cities-cant-ban-plastic-bags-state-might#stream/0>

- Local Law 19: Established New York City's mandatory recycling program requirements for residents, businesses, and institutions.
- Local Law 77: Required New York City Department of sanitation to implement a voluntary residential organic waste curbside collection pilot program and a school organic waste collection pilot program³⁸.

11 Parks

The aforementioned Zero Waste Plans, with the exception of Minneapolis, MN, do not focus on waste diversion efforts in public parks. In order to account for public parks, five case study examples of Zero Waste initiatives and/or waste diversion programs for different jurisdictional parks across the country were analyzed and the findings are described below.

11.1 Three Rivers Park District Zero Waste Program (Plymouth, MN)

The Three Rivers Park District Zero Waste Program in Plymouth, Minnesota has its own Zero Waste initiative. The District promotes that picnics, campers, weddings, and races held in the parks go Zero Waste by reducing the amount of natural resources used through choices made before, during, and after their event and by reducing their impact on the environment through the use of reusable items whenever possible and recycling or composting the rest. The District defines a Zero Waste Event as one that produces less than one ounce of trash per person.³⁹

To ensure this initiative is successful, the District requires that Zero Waste Event practices be followed at their designated Zero Waste Venues. Should the participating party fail to comply with the Zero Waste Events program, it may result in a loss of the paid damage deposit fee. Events at Zero Waste Venues are allowed to have washable dinnerware, cutlery, glassware, linens, and linen napkins, and compostable paper products, cutlery, drinkware, table coverings, and napkins. They are not allowed to have single-serving bottles of water, juice, or carbonated beverages in plastic bottles, and food served in disposable plastic or Styrofoam containers.³⁹

To help aid in this initiative, event hosts using the Zero Waste facilities are able to pre-purchase compostable dinnerware products (e.g. hot & cold cups, plates, bowls, forks, knives, spoons, napkins and straws) through approved caterers as provided by the District. Costs of these items is shown in Table 11-1. The District notes that it's important to use products that are clearly labeled compostable and have the Biodegradable Products Institute (BPI)⁴⁰ Certification logo because compostable products- which are typically made out of sugarcane fibers or vegetable starch- degrade within several months in commercial compost facilities without producing toxic residues.

³⁸ <https://www.grownyc.org/why-zero-waste>

³⁹ [Zero Waste Program | Three Rivers Park District \(threeriversparks.org\)](https://www.threeriversparks.org/zero-waste-program)

⁴⁰ <https://bpiworld.org/>

Table 11-1: Pricing List for Purchasable Compostable Dinnerware for use at Zero Waste Events within the Three Rivers Park District

Item	Quantity	Price
12 oz hot cups	50	\$7.50
9 oz cold squat cup	50	\$5.25
12 oz cold cup	50	\$7.25
6" plates	50	\$3.25
9" plates	50	\$8
6 oz bowls	50	\$3.25
11.5 oz bowls	50	\$4.25
Forks	50	\$4.25
Knives	50	\$4.25
Spoons	50	\$4.25
Dinner napkins	50	\$3
Beverage napkins	50	\$2
7.7" straws	50	\$1

The District is also trying to make future park races Zero Waste. For instance, its future Trail Mix races will be “cupless” and its website asks that racers toss their waste near route aide stations and its volunteers will dispose of it properly. Almost all race event items, including beverage containers and food waste, can be recycled or composted and trash that cannot be recycled or composted is weighed since trash cannot exceed one ounce per participant in order to classify as Zero Waste. Race event signage is recycled year to year, all printed materials use Forest Stewardship Council⁴¹ (FSC) certified paper, and medals and awards are locally produced.⁴²

11.2 Don’t Feed the Landfills / Zero Landfill Initiative National Parks Initiative

In June 2015, Subaru of America (Subaru) announced it would help with the initiative to reduce landfill waste produced from national parks. Subaru partnered with the National Parks Conservation Association⁴³ (NPCA), a non-profit national park advocacy group, to test zero landfill practices in three iconic national parks: Yosemite, Grand Teton and Denali, working toward a goal of significantly reducing waste going into landfills from all national parks. Subaru already had experience in waste management as its Indiana

⁴¹ <https://fsc.org/en>

⁴² [Trail Mix Zero Waste | Three Rivers Park District \(threeriversparks.org\)](https://www.threeriversparks.org/)

⁴³ <https://www.npca.org/>

facility became the first zero landfill auto assembly plant in the United States in 2004 and wanted to expand its expertise to help parks be Zero Waste.⁴⁴

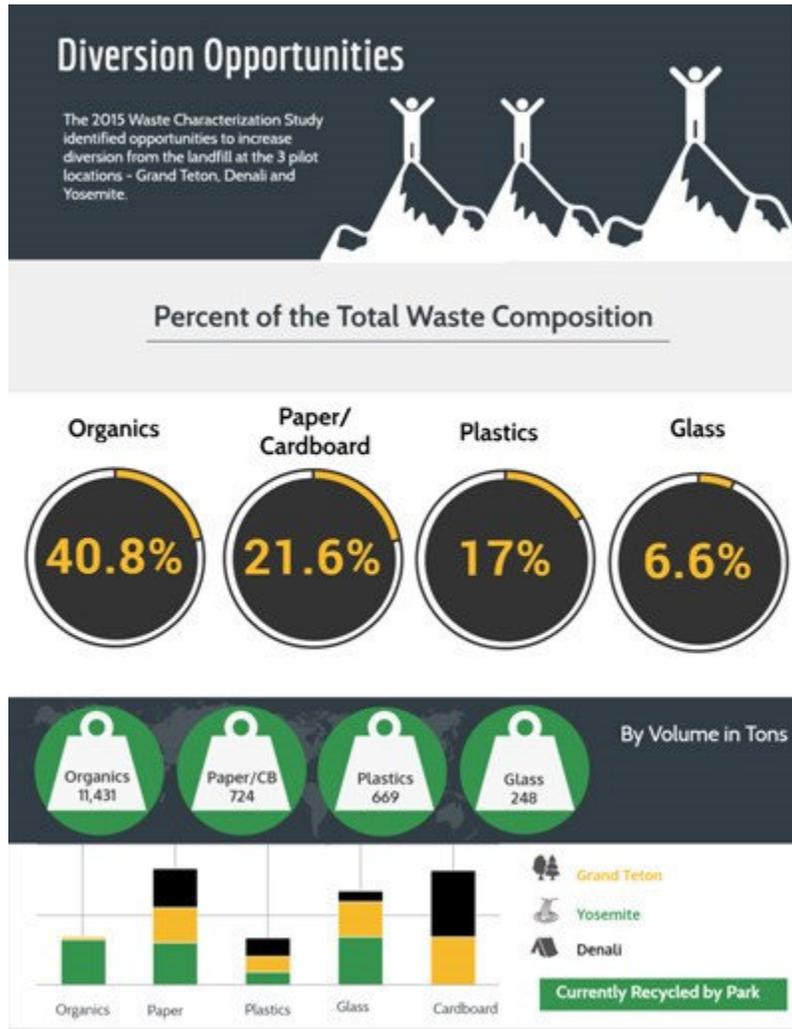
In 2013, the National Park Service managed more than 100 million pounds (50,000 tons) of waste nationally with much of it sourced by the parks' 273.6 million visitors. This total only accounted for the waste managed by the National Park Service and did not account for the waste managed by park concessioners who provide visitors with lodging, food services, transportation, etc., which was expected to be considerably higher. In the same year, more than seven million people visited the three pilot parks which collectively generated 16.6 million pounds (8,300 tons) of visitor waste. Of that amount, 6.9 million pounds (3,450 tons) were diverted from landfill through source reduction, reuse, recycling or composting, and 9.7 million pounds (4,850 tons) were landfilled.⁴⁴

In 2015, Subaru and NCPA conducted a baseline waste characterization study of these three chosen parks as well as reviewed recycling, organic material composting, hazardous waste management, and visitor waste behaviors. As seen in Figure 11-1, the study found that the total waste composition was made up of approximately 41% organics (11,400 tons), 22% paper/cardboard (724 tons), 17% plastics (669 tons), and 7% glass (248 tons).⁴⁵

⁴⁴ [Subaru to Share Zero Landfill Expertise with National Park Service to Reduce Park Waste · National Parks Conservation Association \(npca.org\)](#)

⁴⁵ [Don't Feed the Landfills · National Parks Conservation Association \(npca.org\)](#)

Figure 11-1: Results of the Subaru and NPCA 2015 Baseline Waste Audit for Three National Parks (Grand Teton, Denali and Yosemite)⁴⁵



As of October 2020, all three parks have kept more than 16 billion pounds (8 million tons) of waste out of the landfills since the start of the Don't Feed the Landfills Initiative in 2015. In 2019, these pilot parks cut their landfill waste by nearly 50% through increased recycling and composting efforts. With nearly 1,000 new waste and recycling containers placed in these parks, visitor participation in recycling has increased by approximately 27%.⁴⁵

Subaru continues to support recycling operations, composting, public education, and outreach at Denali National Park and Preserve, Grand Teton National Park, and Yosemite National Park partly through donations. For example, in April 2019, Subaru raised \$2.1 million for national parks through its 2018 Subaru Share the Love® Event and the donations helped enable the National Park Foundation to support waste

reduction efforts and enhance public awareness and engagement across its National Park System.⁴⁶

Zero Landfill Initiatives at each of the three Don't Feed the Landfills pilot parks are discussed below.

11.2.1 Denali National Park⁴⁷

The Denali National Park, located in Alaska, is diverting waste in the following ways:

- Establishing composting opportunities for both employee and visitor waste.
- Improving recycling options at visitor centers and rest stops.
- Replacing paper cups with reusable coffee cups in the Morino Grill, on site dining facility.
- Phasing out plastic bags and single-use plastic water bottles.
- Spreading the word through a social media campaign, #DontFeedtheLandfills.
- Working with the borough and other key stakeholders to improve recycling opportunities for gateway businesses.

The park encourages visitors to:

- Use paperless options for tickets and receipts.
- Travel with reusable water bottles.
- Use reusable bags or no bags at all when purchasing souvenirs.
- Take the extra step to find a nearby recycling bin.
- Let others know: Don't Feed the Landfills!

11.2.2 Grand Teton National Park⁴⁸

As part of the Zero Landfill Initiative, the Grand Teton National Park in Wyoming has a goal to reduce 60% of its waste from landfills by 2030. At Grand Teton, generous funding from Subaru and the NPCA is being used to support a wide variety of programming such as the following Zero Landfill Initiative projects:

- STREAM (Science, Technology, Recycling, Engineering, Arts, Math) art installation, which visualizes park recycling data, in partnership with Jackson Hole Public Art, and Teton County School District.
- Compost Pilot program with Teton County, Signal Mountain Lodge, and the Grand Teton Lodge Company. In 2017, the program gathered food waste from seven different locations within the park, which was then transported to a

⁴⁶ [National Park Waste Reduction Efforts Receive \\$2.1 Million Donation from 2018 Subaru Share the Love® Event | National Park Foundation \(nationalparks.org\)](#)

⁴⁷ [Zero Landfill Initiative - Denali National Park & Preserve \(U.S. National Park Service\) \(nps.gov\)](#)

⁴⁸ [Zero Landfill Initiative - Grand Teton National Park \(U.S. National Park Service\) \(nps.gov\)](#)

composting facility in Gallatin County, Montana. The pilot helped identify best practices for compostable waste collection, storage, and transportation to prepare Grand Teton for the opening of Teton County's own compost facility in 2021. Since 40% of the park's waste is compostable, this creates an opportunity to divert nearly 1,096 tons of food waste annually from Grand Teton's waste stream⁴⁹. An additional pilot was run in 2018 and met its goal of composting 150 tons of food waste in lieu of landfilling.⁵⁰

- Partnership with Teton County Integrated Solid Waste and Recycling to aid in the opening of Teton County's first composting facility in 2021.
- New recycling infrastructure throughout the park.
- Partnerships with park concessionaires, and incentives to go green!
- Funding for additional education and outreach projects.

11.2.3 Yosemite National Park⁵¹

Over four million people visit Yosemite National Park in California every year. Between visitors and park staff, nearly 2,200 tons of garbage are generated annually.

In early 2016, with help from Subaru, the NPCA, and the Yosemite Conservancy, the park set an ambitious target of diverting 80% of its waste from the landfill by the end of 2017 to align with the Zero Landfill Initiative.

The park initially began a recycling program in 1975, which allowed for the collection of aluminum, glass, and paper. In the years since, Yosemite and its concessioners built a strong program that has diverted about 60% of the total waste stream from going into the Mariposa County landfill. In addition to recycling, the overall amount of Yosemite's garbage heading to the landfill has been reduced by practices such as buying in bulk to reducing unnecessary packaging and re-using materials, such as those used for certain building repairs.

The Zero Landfill Initiative at Yosemite was designed to build on these achievements. The Zero Landfill Initiative initially focused on upgrades to infrastructure, such as replacing many of the "Half-Dome" shaped trash and recycling cans throughout the park and installing more water bottle refilling stations. The initiative also was designed to expand collection of compostable food waste to both park employees and visitors.

According to the baseline waste characterization study conducted in the park in July 2015, about 20% of what was in Yosemite's trash was already being targeted for recycling. The most common recyclable items found in the park's trash were single-use water bottles, aluminum cans, and paper. It was expected that by installing more recycling bins and adding labels with photographs of what can be recycled, the percentage of recyclables would go down. Based on 2020 overall numbers, this appears to be true.

⁴⁹ [Compost Pilot - Grand Teton National Park \(U.S. National Park Service\) \(nps.gov\)](https://www.nps.gov/comm/learn/zero-waste/compost-pilot-grand-teton-national-park)

⁵⁰ [tetonwyo.org/DocumentCenter/View/9088/Piloting-Food-Waste-Collection_2018_FINAL](https://www.tetonwyo.org/DocumentCenter/View/9088/Piloting-Food-Waste-Collection_2018_FINAL)

⁵¹ [Zero Landfill Initiative - Yosemite National Park \(U.S. National Park Service\) \(nps.gov\)](https://www.nps.gov/comm/learn/zero-waste/zero-landfill-initiative-yosemite-national-park)

In places managed by National Park Service staff (e.g. campgrounds, visitor centers, the museum, bus stops, and day use picnic areas) Yosemite has mixed recycling. At hotels and eating establishments operated by the park concessioner, there are separate recycling containers for each type of material collected (paper, glass, aluminum, and plastic). The park was looking into using the “organic waste” cans in the food service facilities to reroute the organic material and compostable paper, including compostable tableware like paper napkins and compostable utensils.

After implementation, the overall Zero Landfill Initiative’s successes, challenges, lessons learned, and best practices were analyzed, and the results were grouped into six primary categories in Table 11-2.⁵²

⁵² [Waste Reduction - Sustainability \(U.S. National Park Service\) \(nps.gov\)](#)

Table 11-2: National Park Zero Landfill Initiative Assessment

Category	Best Practice	Key Challenge	Lessons Learned
Teamwork and Partnerships	<p>Understand and engage with the surrounding community.</p> <p><i>Example: Yosemite National Park has a stakeholder engagement with Yosemite Gateway Partners, which represents more than 80 organizations in the communities surrounding the park. Stakeholders have the opportunity to learn from one another, stay up-to-date on zero landfill programs, and exchange tips and resources.</i></p>	<p>Accommodating smaller organizations that want to utilize a park or large concessioner’s waste management services.</p> <p><i>Example: Small businesses near Denali National Park have expressed interest in the park accepting, processing, and hauling their recyclables. As a solution, Denali partnered with the nonprofit Denali Education Center, which can help support small businesses’ recycling efforts.</i></p>	<p>Both in-park and external community resources can help accomplish Zero Waste goals.</p> <p>There are limitations to what NPS concessioners are able to do on their own with respect to waste management.</p> <p>Collaboration is necessary between the park and surrounding communities, as is understanding the regional waste landscape.</p>
Visitor Communication	<p>Standardize signage and visitor communications related to recycling materials management.</p> <p><i>Example: Grand Teton National Park created a series of short videos on topics like greening your picnic or properly recycling in the park. One video plays hourly in the Grand Teton visitor center movie theater.</i></p>	<p>Visitors may hear conflicting information about local recycling availability.</p> <p><i>Example: Messaging in some hotels may give visitors the impression that recycling is not available. To avoid confusion, parks and concessioners could compile information on current waste management capabilities and share it with employees and surrounding businesses.</i></p>	<p>Effective communication with visitors can significantly reduce visitor waste.</p>

Category	Best Practice	Key Challenge	Lessons Learned
Employee Communication and Culture	<p>Designate a person at the top who shapes employee culture, develops training programs, and institutionalizes them.</p> <p><i>Example: Grand Teton Lodge Company provides extensive training to its approximately 1,000 employees on zero landfill initiatives, including recycling and composting education.</i></p>	<p>Maintaining a continuity of culture is difficult when operations and employees are seasonal.</p>	<p>Employees are crucial to the success of waste reduction programs.</p> <p>An organization needs to have internal goals and buy-in from the top.</p> <p>There must be a champion who determines how waste management duties will be shared.</p> <p>Employees should be properly trained and educated on the program.</p>
Food Waste Management	<p>Seek opportunities to prevent food waste generation.</p> <p><i>Example: Since the Zero Landfill Initiative waste audit, Grand Teton National Park now manages its compost at a commercial scale and uses dumpsters and dump trucks to manage the volume.</i></p>	<p>Composting facilities that parks and concessioners work with may be far away from the parks</p>	<p>Food waste management and collection is essential to any successful Zero Waste initiative.</p>
Data Collection	<p>Conduct a baseline audit/waste characterization study to understand the current waste landscape.</p> <p><i>Example: At Denali National Park, Aramark uses an industrial scale and has developed a comprehensive tracking system to control data gathering.</i></p>	<p>Parks may lack uniform data collection systems.</p>	<p>Measurement is the first step in effectively managing Zero Waste initiatives.</p> <p>It is beneficial for the park and its concessioners to adopt the same data collection system.</p>



Category	Best Practice	Key Challenge	Lessons Learned
Other Park Characteristics	Park-specific characteristics are important to consider with respect to waste management within a park.	Park location, cost of infrastructure, and lack of capacity (e.g., lack of staff dedicated to sustainability).	<p>Waste management is particularly challenging for parks in remote areas, which may need to rely on existing local, municipal, and/or county resources.</p> <p>It may be difficult to find companies willing to travel to remote parks to collect waste, recycling, and composting.</p> <p>Parks must account for wildlife concerns, but bear-proof bins are costly.</p> <p>Capacity issues may arise if sustainability efforts are not a high priority for staffing and funding.</p>

11.3 City of Salisbury, MD⁵³

In 2017, the City of Salisbury explored the opportunity to improve its recycling offerings through installing recycling bins in the City's thirteen public parks. By doing this, there would possibly be a decrease in municipal waste management disposal costs, an increase in recycling opportunities for residents, and could encourage community members to participate in environmentally friendly activities. When the City spoke with its residents, many expressed their frustration with not having access to recycling bins in the City's public parks.

It was proposed closed-top recycling cans of differing color be placed right next to trash cans in the parks. The City of Salisbury's Department of Field Operations would oversee the collection of recyclables, alongside existing garbage collection, on a regular basis. While the installation of recycling bins in city public parks can be expensive (on average, recycling bins for outdoor spaces can range from \$300 to \$1,500 based upon the size and sturdiness of the recycling bins and steel recycling bins are recommended for sustainability and longevity) the City referenced the following case study examples which highlight innovative ways to offset costs for new recycling bin installations through advertisement sales or recycling bin grants:

- In 2011, in response to city resident's desire to live in a greener city as expressed through community forums, the Public Space Recycling Program in Colorado Springs, Colorado, installed 90 recycling bins in seven of the city's large community parks and sports complexes. The recycling bins were provided, installed, and maintained for free by a public space recycling and environmental organization, called "Greener Corners." In return, Greener Corners advertisements were placed on the recycling bins.
- In 2017, Oak Park, Michigan, offset the cost of the installation of 20 recycling bins through a recycling bin grant program sponsored by the Dr. Pepper Snapple Group in collaboration with Keep America Beautiful.
- Similarly, in 2016, the non-profit sustainability group Annapolis Green donated 22 recycling bins to be placed in public parks around the City. Before the donation, there were only six recycling bins for all of the city's 41 parks. Annapolis Green used a grant from the Dr. Pepper Snapple Group and Keep America Beautiful to pay for the bins, which had a retail value of more than \$11,000. In 2016, the Dr. Pepper Snapple Group and Keep America Beautiful grant program provided funding for 900 recycling bins in parks across the country. Annapolis Green and the city's Recreation and Parks Department planned to collaborate on quarterly audits to determine how much recycling and landfill trash was being collected, whether the recycling was being contaminated and how often recyclables were getting into the proper bins after the bins were installed. Changes to the bins' placement and the public awareness campaign would be made based on the findings.⁵⁴

⁵³ [Installing City Park Recycling Bins \(salisbury.edu\)](https://www.salisbury.edu/zero-waste-plan-development/11-3-city-of-salisbury-md)

⁵⁴ [Group donates 22 recycling bins for use in Annapolis parks - Capital Gazette](https://www.washingtonpost.com/news/energy-environment/wp/2016/08/22/group-donates-22-recycling-bins-for-use-in-annapolis-parks-capital-gazette/)

In order to seek funds for the purchasing of outdoor recycling bins, the City suggested utilizing government-based grants, corporate sponsorships, private funding, and/or the internal distribution of funding from within the City's budget. It was proposed the City of Salisbury's Department of Field Operations would oversee the collection of recyclables, alongside existing garbage collection, on a regular basis.

11.4 Charleston, SC⁵⁵

Keep Charleston Beautiful (KCB) works with Charleston's Parks Department to help install recycling bins in City parks. Their goal is to reduce the amount of waste and litter generated within City parks and increase the amount of recycling diverted from landfills. The City of Charleston's Department of Parks maintains and empties the bins within the parks, and the materials are taken to Charleston County drop-sites. The recycling bins do not collect clothes, containers with leftover food, dog waste/diapers and Styrofoam. Grant funding from Keep America Beautiful and its supporting companies (e.g., Nestle Waters, UPS Foundation, Waste Management, the City, SCSPA, etc.) has allowed the installation of recycling and trash bins in many (almost 20) of the City parks from years 2009 to 2018 so far.

As part of Charleston's Green Plan Zero Waste document, one suggestion to facilitate organic composting is to identify locations at City parks where it would be practical to compost on-site.⁵⁶

11.5 Minneapolis, MN Zero Waste Plan⁵⁷

The 2017 City of Minneapolis Zero Waste Plan, the Minneapolis Parks and Recreation Board (MPRB) maintains and regulates an expansive system of parks and recreation-related sites within the City, including 179 parks and numerous lakes, recreation centers, gardens and bird sanctuaries, historical sites, and trails and parkways. Additionally, MPRB contracts for restaurant vendors located at some regional parks and partners with Minneapolis Public Schools (MPS) to distribute over 130,000 meals annually at 39 sites through after school and summer lunch programs.

Waste throughout neighborhood parks is collected by City services in separate carts for trash and recycling. The Division of Solid Waste and Recycling (SW&R) provides separate organics collection for materials collected inside park buildings. MPRB collects trash and recycling throughout the regional parks located within the City and maintains separate contracts for processing of these materials. MPRB also contracts with private haulers to collect dumpsters for garbage, recycling, organics, and specialty items at select locations (e.g., restaurants located at regional parks and headquarter buildings). In addition to regular operations, MPRB regulates the use of City park spaces and facilities for special events which involves a special permitting process. The 2017-2018 Park Use and Event Permit requirements pertaining to solid waste for events held in City parks include, but are not limited, to the following:

⁵⁵ [Green Spaces Recycling | Charleston, SC - Official Website \(charleston-sc.gov\)](https://www.charleston-sc.gov/green-spaces-recycling)

⁵⁶ [Introduction \(charleston-sc.gov\)](https://www.charleston-sc.gov/introduction)

⁵⁷ [Minneapolis Zero Waste Plan \(minneapolismn.gov\)](https://www.minneapolismn.gov/zero-waste-plan)

- All events are required to recycle recyclable waste;
- All events are required to provide trash/recycling removal services;
- All events must provide recycling containers for event attendees in a 1:1 ratio of recycling containers to garbage containers; and
- If dumpsters are requested, they must be placed at locations designated by the MPRB.

MPRB also offers an Events Go Green certification to recognize events that adopt sustainable practices. There are currently no organics diversion requirements to obtain an MPRB event permit. Strategies to supplement the existing waste diversion activities were determined as follows:

1. Encourage MPRB to update park event solid waste management requirements to match City requirements upon the City updating its event recycling ordinances;
2. Encourage MPRB to expand waste management requirements for Events Go Green certification to include organics diversion;
3. Encourage increased recycling through education and more conveniently placed containers;
4. Collaborate with MPRB to receive internal waste hauling and diversion data to evaluate overall waste generation and diversion;
5. Collaborate with MPRB to develop staff educational resources and training;
6. Collaborate with MPRB and MPS to order the appropriate number of meals for after school and summer lunch programs and explore the feasibility of donating leftover edible food;
7. Encourage MPRB to host after school programs on waste reduction and diversion and the associated benefits;
8. Support MPRB Ecological System Plan for community composting on park property; and
9. Encourage MPRB to use finished compost in its operations.

Table 11-3 was developed as part of the City of Minneapolis' Zero Waste Plan to analyze the aforementioned Zero Waste strategies for implementation and anticipated levels of diversion potential, implementation difficulty, ongoing costs and implementation timing.

Table 11-3: Matrix for Suggested MPRB Waste Diversion Strategies⁵⁸

Strategy	Lead Depts	Increased Diversion Potential	Difficulty of Implementation	Ongoing Cost to City	Implementation Timing	Comments
Encourage Recycling through Education and Convenient Container Placement	SW&R	Medium	Low	Low	Mid	Additional staffing and resource needs
Encourage MPRB to Revise Park Event Requirements to Align with City Requirements	SW&R	Low	Low	Low	Near-Mid	Additional staffing and resource needs
Encourage MPRB to Expand Events Go Green Certification to Include Organics	SW&R	Medium	Low	Low	Mid	Additional staffing and resource needs
Collaborate with MPRB to Receive Internal Waste Hauling and Diversion Data	SW&R	Low	Low	Low-Mid	Mid	
Collaborate with MPRB and MPS to Order the Appropriate Number of Meals for School Programs	SW&R	Low	Low	Low	Mid	
Collaborate with MPRB to Develop Staff Educational Resources and Training	SW&R	Medium	Low	Low	Mid	Additional staffing and resource needs
Encourage MPRB to Host After School Programs	SW&R	Medium	Medium	Low	Mid	
Support MPRB Ecological System Plan for Community Composting on Park Property	SW&R	Low	Low	Low	Near-Mid	Additional staffing and resource needs
Encourage MPRB to Use Finished Compost in its Operations	SW&R	Low	Low	Low	Near	

⁵⁸ [Minneapolis Zero Waste Plan \(minneapolismn.gov\)](https://www.minneapolis.gov/minneapolis-zero-waste-plan)

12 Summary

Fairfax County, in comparison to communities mentioned in this report, is moderately populated in respect to its geographic area. Compared to the other communities, Fairfax County employs a standard amount of government workers and holds an average amount of students and staff in their school system.

All communities discussed in this report have Zero Waste goals, some more specific than others. The Zero Waste goals identified for each community plan are to be achieved by different programs and policies to control different aspects of solid waste management. Some communities, like Montgomery County, implemented a 2020 reduction goal that was not reached and as a result identified additional programs and policies to reach Zero Waste. All communities discussed in this report have an established educational or outreach program to improve waste reduction and recycling.

Programs in place to specifically to improve waste reduction and diversion in schools, government buildings, and parks have been identified and are further analyzed the Fairfax County Government and Schools Zero Waste Plan and Appendix F.



Appendix F: Zero Waste Strategy Details & Impact Matrix

Zero Waste Plan Development

Fairfax County, VA
September 14, 2021



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Contents

1	Introduction	1
2	Prioritization of the Developed 24 Strategies	2
2.1	Theme #1: Culture: Education and Outreach	3
2.1.1	Designate Zero Waste Champions	3
2.1.2	Develop Strategies to Recognize, Motivate, and Compensate Staff.....	4
2.1.3	Develop Educational Resources, Signage, and Training	5
2.1.4	Facilitate Action through Campaigns, Toolkits, and Guides	7
2.1.5	Maximize Opportunities for Student Engagement	8
2.2	Theme #2: Program Establishment	9
2.2.1	Establish Zero Waste Team	9
2.2.2	Expand Sustainable Purchasing Program	10
2.2.3	Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts.....	12
2.2.4	Establish Programmatic Reporting of Activities by County Departments and Schools.....	13
2.2.5	Measure Success: Waste Audits, Reporting, Facility Assessments.....	15
2.2.6	Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships.....	16
2.2.7	Launch a Reusable Packaging Program.....	18
2.2.8	Establish or Expand Edible Food Rescue and Donation Program	22
2.3	Theme #3: Facility Upgrades.....	24
2.3.1	Design and Retrofit for Zero Waste.....	24
2.3.2	Standardize and Increase Waste Receptacles and Signage.....	25
2.3.3	Implement Reusable Food Service Ware	30
2.3.4	Install Additional Air Hand Dryers.....	33
2.3.5	Install Additional Bottle Filling Stations	34
2.4	Theme #4: Policy Implementation/Board Directives.....	38
2.4.1	Establish a Zero Waste Policy.....	38
2.4.2	Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	39
2.4.3	Establish Board Directive/Policy for Organics or a Food Disposal Ban.....	41
2.4.4	Establish Board Directive/Policy to Ban Single-use Plastics	42
2.4.5	Support Legislative Actions at The State and Federal Levels	43
2.4.6	Use Events as a Catalyst to Minimize or Eliminate Waste	45
3	Tiered Matrix for Implementation.....	47
4	Prioritization of Initial 50 Zero Waste Options	50
5	Conclusion	51

Tables

Table 2-1. Developed 24 Zero Waste Strategies	2
Table 2-2. Designate Zero Waste Champions	3
Table 2-3 Develop Strategies to Recognize, Motivate, and Compensate Staff.....	4
Table 2-4. Develop Educational Resources, Signage and Training	5
Table 2-5 Facilitate Action through Campaigns, Toolkits and Guides	7
Table 2-6 Maximize Opportunities for Student Engagement	8
Table 2-7. Establish Zero Waste Teams	9
Table 2-8. Expand Sustainable Purchasing Program	11
Table 2-9 Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts	13
Table 2-10 Establish Programmatic Reporting of Activities by County Departments and Schools.....	14
Table 2-11 Measure Success: Waste Audits, Reporting, Facility Assessments.....	15
Table 2-12. Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	17
Table 2-13 Launch a Reusable Packaging Program.....	21
Table 2-14. Establish or Expand Edible Food Rescue and Donation Program	22
Table 2-15 Design and Retrofit for Zero Waste.....	24
Table 2-16. Standardize and Increase Waste Receptacles and Signage.....	28
Table 2-17. Implement Reusable Food Service Ware	30
Table 2-18. Install Additional Air Hand Dryers.....	33
Table 2-19. Install Additional Bottle Filling Stations	36
Table 2-20. Establish a Zero Waste Policy.....	38
Table 2-21. Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	40
Table 2-22. Establish Board Directive/Policy for Organics or a Food Disposal Ban.....	41
Table 2-23. Establish Board Directive/Policy to Ban Single-use Plastics	43
Table 2-24. Support Legislative Actions at The State and Federal Levels	44
Table 2-25. Use Events as a Catalyst to Minimize or Eliminate Waste	45
Table 3-1. Tiered Matrix of Evaluated 24 Zero Waste Options	48
Table 4-1: Identified 50 Zero Waste Strategies for Potential Implementation	50

Figures

Figure 2-1. FCPS reuses bulk product packaging for future shipments.	19
Figure 2-2. Bulk items are removed from initial packaging and stored in individual organized containers.	19
Figure 2-3. Cardboard boxes and pallets are saved for reuse.	20
Figure 2-4. Cardboard boxes are saved and stored for eventual reuse.	20
Figure 2-5. EPA Food Recovery Hierarchy	22
Figure 2-6. Incorrect labeling of trash can as composting container.....	26
Figure 2-7. Only having bottle and can blue recycling containers in the vicinity makes users believe paper is not collected.	26
Figure 2-8. Incorrect labeling of exterior County dumpster; the County has single-stream recycling and also collects bottles/cans. The dumpster could also be painted blue to clearly indicate it is a recycling receptacle.	27
Figure 2-9. Cardboard slots on exterior dumpsters makes user believe only cardboard is accepted. Suggest replacing or enhancing existing exterior recycling dumpsters to not have or indicate cardboard slots.	27
Figure 2-10. Elite ErgoCan Three-Stream Station	28
Figure 2-11. Installed Bottle Filling Station at a Current FCPS Middle School (spout currently inoperable due to COVID-19 health and safety regulations).	35
Figure 2-12. Standard Water Fountain.	35
Figure 2-13. Standard Water Cooler.....	36

ACRONYMS AND ABBREVIATIONS

ASTM	American Society for Testing and Materials
BYOB	Bring Your Own Bottle
CLF	Closed Loop Fund
DPMM	Department of Purchasing and Materials Management
DPWES- SWMP	Department of Public Works Environmental Services-Solid Waste Management Program
ECC	Environmental Coordinating Committee
EIP	Environmental Improvement Program
EPA	United States Environmental Protection Agency
EPP	Environmental Preferable Purchasing
EPR	Extended Producer Responsibility
FCBOS	Fairfax County Board of Supervisors
FCPA	Fairfax County Park Authority
FCPS	Fairfax County Public Schools
FCSWMP or SWMP	Fairfax County Solid Waste Management Program
FEEE	Fairfax Employees for Environmental Excellence
FMD	Facilities Management Department
FTE	Full Time Equivalent
GBCI	Green Business Certification Inc.
JET	Joint Environmental Task Force
MRF	Materials Recovery Facility
O&M	Operation and Maintenance
P&E	Promotional and Educational Material

1 Introduction

HDR has been retained by Fairfax County for the development of a Zero Waste Plan for its government and school operations.

The Strategy Details and Impact Matrix is part of a series of Interim Task reports HDR developed in support of the project. The purpose of this report is to first identify a full list of Zero Waste options, partly based on options discussed in the Literature Research Interim Report, that could aide in waste diversion efforts in Fairfax County facilities, including parks, and Fairfax County Public Schools (FCPS) locations, and then further evaluate a subset of those options for potential implementation in Fairfax County.

A total of 24 Zero Waste strategies were developed from 50 options initially identified. The 24 Zero Waste strategies are categorized into four overarching themes:

1. Culture Education and Outreach
2. Program Establishment
3. Facility Upgrades
4. Policy Implementation/Board Directives

Of the total 50 identified Zero Waste options, 24 options deemed to be most impactful were identified. Each of the 24 options were first evaluated in greater detail assessing multiple factors including their implementation timeframes (short- versus long- term) and potential cost factors. The specific factors were combined to create a tiered impact matrix of the evaluated 24 options. The tiered matrix provides a suite of potentially implementable Zero Waste action plans, ranging from highest net impact (Gold) to medium impact (Silver) to lower impact (Bronze). See Table 3-1 for Strategy details and the impact matrix.

2 Prioritization of the Developed 24 Strategies

A total of 24 Zero Waste strategies were identified. Each option was categorized into one of the following four themes: Theme #1 – Culture: Education and Outreach; Theme #2 – Program Establishment; Theme #3 – Facility Upgrades; and Theme #4 – Policy Implementation/Board Directive. Please refer to **Table 2-1** for these categorized themes and options. The options in each theme are ranked in descending order from highest priority to least priority and identified as having either short-term or long-term estimated implementation timeframes. The evaluations of each of the 24 chosen strategies are discussed in the following sections.

Table 2-1. Developed 24 Zero Waste Strategies

#	Option	Short-Term or Long-Term (ST or LT)
Theme #1: Culture: Education and Outreach		
1.	Designate Zero Waste Champions	ST
2.	Develop Strategies to Recognize, Motivate, and Compensate Staff	ST
3.	Develop Educational Resources, Signage and Training	LT
4.	Facilitate Action through Campaigns, Toolkits and Guides	LT
5.	Maximize Opportunities for Student Engagement	LT
Theme #2: Program Establishment		
1.	Establish Zero Waste Team	ST
2.	Expand Sustainable Purchasing Program	LT
3.	Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts	ST
4.	Establish Programmatic Reporting of Activities by County Departments and Schools	ST
5.	Measure Success: Waste Audits, Reporting, Facility Assessments	LT
6.	Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	LT
7.	Launch a Reusable Packaging Program	ST
8.	Establish or Expand Edible Food Rescue and Donation Program	LT
Theme #3: Facility Upgrades		
1.	Design and Retrofit for Zero Waste	LT
2.	Standardize and Increase Receptacles and Signage	ST
3.	Implement Reusable Food Service ware	LT
4.	Install Additional Air Hand Dryers	LT
5.	Install Additional Bottle Filling Stations	LT
Theme #4: Policy Implementation/Board Directive		
1.	Establish a Zero Waste Policy	ST
2.	Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	LT
3.	Establish Board Directive/Policy for Organics or a Food Disposal Ban	LT
4.	Establish Board Directive/Policy to Ban Single-use Plastics	ST
5.	Support Legislative Actions at The State and Federal Levels	LT
6.	Use Events as a Catalyst to Minimize or Eliminate Waste	LT

All cost estimates were prepared by HDR with best available information as of the date of this Report. As additional surveys of facilities are conducted, Zero Waste implementation needs are evaluated, and procurement of equipment and services occur, it is likely the cost estimates will change.

2.1 Theme #1: Culture: Education and Outreach

The following options involve actions that will promote Zero Waste initiatives through educational trainings, leadership and partnerships as well as outreach campaigns.

2.1.1 Designate Zero Waste Champions

This option involves assigning a staff member or facility employee to be the designated Zero Waste Champion. The Champion will provide the leadership, energy and enthusiasm to advance Zero Waste initiatives, educate other members or employees on proper materials management, ensure implemented Zero Waste efforts are being followed, be responsible for tracking Zero Waste progress, and possibly be in charge of holding Zero Waste educational workshops/trainings. There could be local office champions or overall champions in charge of multiple locations. For example, there could be multiple champions in charge of multiple FCPS locations (207 locations total). Similarly, it could mirror One Fairfax’s structure where each Fairfax County department has a Zero Waste Team with a designated Zero Waste Lead (Champion). The Zero Waste Team could create an internal Zero Waste Plan for each department, partially through provided resource guidance from the Solid Waste Management Plan (SWMP) or Department of Purchasing and Materials Management (DPMM).

Table 2-2. Designate Zero Waste Champions

Option: Designate Zero Waste Champions	
Description of Option	<ul style="list-style-type: none"> Designate employees to be Zero Waste Champions to inspire, lead and track Zero Waste or waste diversion efforts. Zero Waste Champions can establish groups of designated individuals to be a part of a “Green Team” that will promote sustainability and Zero Waste practices in schools, offices, and other facilities.
Actions/Potential Challenges	<ul style="list-style-type: none"> Getting enough interested staff/employees to volunteer to be advocates. May need to offer incentives such as bonuses or additional vacation time to secure participants.
Benefits/Impacts	<ul style="list-style-type: none"> Provides leadership, energy, and enthusiasm for Zero Waste initiatives. Allows for a more hands-on and direct approach to Zero Waste program efforts and success of those efforts. Creates a key point of contact and enforcer.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term This option could be implemented immediately through emailed inquiries to staff/employees. The conducted Zero Waste Employee Survey has already identified some potential volunteers.
Interaction with Other System Components	<ul style="list-style-type: none"> Zero Waste Champions would likely be the ones to host educational workshops/trainings on Zero Waste.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> One or two full time equivalent (FTE) staff could be hired to help oversee all Zero Waste Champion efforts, organize meetings, etc.

Option: Designate Zero Waste Champions	
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Direct oversight and enforcement could result in increased diversion rates and reduced contamination rates.
Potential Cost Implications	<ul style="list-style-type: none"> It is assumed the Zero Waste Champion will be a voluntary role made up of current employees and staff. Fairfax County has 46 departments. It is suggested there be one designated Zero Waste Champion for each of the 46 County departments, and 207 designated champions for FCPS (one for each FCPS location). This equates to 253 total volunteer champions. Champions may want or need to be incentivized to participate. A “Green Bonus” could be developed that would pay each champion an annual salary bonus of \$3,300. With 253 total volunteer champions, the annual total cost for incentives would be \$834,900. One or two FTE, additional hired staff could help oversee all Zero Waste Champion efforts, organize meetings, etc. Assuming 1 FTE equates to \$120,000 per year, including salary and benefits, the cost for additional staff could range from \$120,000 to \$240,000 annually.
General Implementation Requirements	<ul style="list-style-type: none"> Would need willing and passionate staff/employees to participate. Would need to identify advocates/champions (possibly through emails, additional surveying or outreach by SWMP).

2.1.2 Develop Strategies to Recognize, Motivate, and Compensate Staff

This option would ensure that the staff participating in Zero Waste Plan initiatives at either county facilities or within FCPS would be recognized and compensated for their efforts. Additional motivation is also necessary to ensure the continuous participation in the leadership team, while incentivizing additional people to participate.

Table 2-3 Develop Strategies to Recognize, Motivate, and Compensate Staff

Option: Develop Strategies to Recognize, Motivate, and Compensate Staff	
Description of Option	<ul style="list-style-type: none"> Establish strategies such as awards (monetary and/or recognition) to motivate staff to adopt and promote Zero Waste practices.
Actions/Potential Challenges	<ul style="list-style-type: none"> Create incentives that are strong enough to motivate volunteers to participate. May need to offer incentives such as bonuses or additional vacation time to secure participants.
Benefits/Impacts	<ul style="list-style-type: none"> Increase morale of volunteers by providing incentives and compensation. Higher likelihood of attracting more volunteers based on the benefits.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term



Option: Develop Strategies to Recognize, Motivate, and Compensate Staff	
Interaction with Other System Components	<ul style="list-style-type: none"> Zero Waste Champions would most likely be the ones to benefit from this option as it will show appreciation for their efforts to implement and support the Zero Waste Plan.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Would likely use existing staff/employees (e.g., Zero Waste Champions) so no job loss or creation would be expected to occur.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Increased participation in Zero Waste practices could result in increased diversion rates and reduced contamination rates.
Potential Cost Implications	<ul style="list-style-type: none"> It is assumed participants of this strategy will be in a voluntary role made up of current employees and staff. Awards could include financial compensation, leave, or formal recognition, which would have varied financial implications.
General Implementation Requirements	<ul style="list-style-type: none"> Would need to identify strong enough incentives to retain volunteers and attract new ones.

2.1.3 Develop Educational Resources, Signage, and Training

Education is critical to successfully implementing a Zero Waste Plan in the County. Educational workshops and trainings for waste diversion, recycling, composting, and other waste management practices would help ease the transition to Zero Waste for students, teachers, workers, etc. and Fairfax’s overall waste management system. During the audits, it was noticed that it was common for plastics and other recyclables to be contained in single-use plastic bags which can damage Materials Recovery Facility (MRF) equipment and interrupt waste processing causing downtime. Educating custodial staff to not bag recyclable materials and to instead place recyclables loose in exterior dumpsters would mitigate operational issues. This would also reduce contamination in the recycling stream which would improve Fairfax’s waste management system and recycling rates. As part of the conducted Zero Waste Employee Survey, approximately 25 percent of Fairfax County employees said there was confusion about what is and what is not recyclable.

Table 2-4. Develop Educational Resources, Signage and Training

Option: Develop Educational Resources, Signage and Training	
Description of Option	<ul style="list-style-type: none"> Hold workshops and trainings to teach and promote each Zero Waste practice in both informational and action campaign settings. Resources, such as visuals and marketing campaigns, should be tailored to specific groups to provide training across the four R’s.
Actions/Potential Challenges	<ul style="list-style-type: none"> Securing County-owned locations to host workshops/trainings and volunteers to organize and run the workshops/trainings.

Option: Develop Educational Resources, Signage and Training	
	<ul style="list-style-type: none"> • Development of workshop/training content could at first be costly and time-consuming. A communications toolkit/template could be created for Zero Waste Advocates/Champions to enhance the impact of waste assessments and share results with facility colleagues. The Recycling Partnership has established communication best practices that could be utilized.¹ • There is potential for increased litter during collection and transportation of loose collected recyclables.
Benefits/Impacts	<ul style="list-style-type: none"> • Education about waste diversion, recycling, composting, and Zero Waste practices would positively impact waste generation and recycling diversion rates. • Reducing the use of plastic liners will decrease additional single-use plastic entering the waste stream, while allowing more efficient waste processing at the MRF.
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> • The conducted Zero Waste survey has already identified some potential volunteers to be Zero Waste Advocates/Site Champions who could also potentially run the workshops. • Members of Zero Waste Teams could assist with these trainings/workshops and elaborate on the programs they have developed.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • Would likely use existing staff/employees (e.g., Zero Waste Advocates/Site Champions) so no job loss or creation would expect to occur. • High school students or other Zero Waste Team members could also volunteer at these workshops.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • Workshops and trainings could result in increased diversion rates and reduced contamination rates.
Potential Cost Implications	<ul style="list-style-type: none"> • Making Promotional and Educational (P&E) materials for the workshops/trainings for all County facilities and FCPS locations could equate to about \$100,000. Support on P&E content will be needed from volunteer champions. • Potential incentive costs for Zero Waste Champions to volunteer to host workshops/trainings could be about \$834,900 (refer to Table 2-2). • Total Cost for this option would be about \$934,900.

¹ [Recycling Campaign Builder - A Free Tool from The Recycling Partnership](#)

Option: Develop Educational Resources, Signage and Training	
General Implementation Requirements	<ul style="list-style-type: none"> This option would require Fairfax County to generate educational materials to be used for the trainings. The workshops and trainings could be used to advocate the Zero Waste Plan and other programs that come out of the plan.

2.1.4 Facilitate Action through Campaigns, Toolkits, and Guides

This option uses the support of the educational resources and Zero Waste Team to hold campaigns and put together toolkits that can make increasing waste diversion more accessible.

Table 2-5 Facilitate Action through Campaigns, Toolkits and Guides

Option: Facilitate Action through Campaigns, Toolkits and Guides	
Description of Option	<ul style="list-style-type: none"> Utilize the Zero Waste Champions and Green Teams to engage staff members, employees, and students through campaigns, toolkits, and guides.
Actions/Potential Challenges	<ul style="list-style-type: none"> Creating materials that are consistent with the developed Zero Waste strategies and adjusted for the audience.
Benefits/Impacts	<ul style="list-style-type: none"> Developed materials could be utilized for other Zero Waste strategies discussed in this Plan. Provides tools and knowledge to ease waste diversion and promote the benefits of recycling.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> The educational resources, signage and training option would work by using campaigns, guides and toolkits that put plans into action.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Would likely use existing staff/employees (e.g., Zero Waste Champions) so no job loss nor creation would expect to occur. High school students or other Zero Waste team members could also volunteer at these workshops.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Campaigns and toolkits could result in increased diversion rates and reduced contamination rates.
Potential Cost Implications	<ul style="list-style-type: none"> Creating P&E Material for the campaigns, toolkits, and guides for all County facilities and FCPS locations could equate to about \$100,000. Support on P&E content will be needed from volunteer champions.

Option: Facilitate Action through Campaigns, Toolkits and Guides	
General Implementation Requirements	<ul style="list-style-type: none"> This option would require Fairfax County to generate educational materials as they guide Zero Waste and prepare toolkits. The campaigns could be used to advocate the Zero Waste Plan and other programs that come out of the plan.

2.1.5 Maximize Opportunities for Student Engagement

With this option, students could have the opportunity to assist the staff members that are dedicated to achieving Zero Waste through the strategies identified in this Plan. Student volunteers would increase the number of Zero Waste advocates throughout the school to further raise awareness. The student perspective on Zero Waste would benefit Fairfax County on how to better engage younger generations on recycling efforts. Students could participate in school events, or county campaigns to gain community service experience by helping raise awareness and action on waste diversion.

Table 2-6 Maximize Opportunities for Student Engagement

Option: Maximize Opportunities for Student Engagement	
Description of Option	<ul style="list-style-type: none"> Provide opportunities for students to be engaged with Zero Waste through curriculum and other instructional priorities.
Actions/Potential Challenges	<ul style="list-style-type: none"> Find students that are interested in working with Zero Waste Champions and advocating for Zero Waste. Create a student organization that would be designated to work under the designated Zero Waste Champions.
Benefits/Impacts	<ul style="list-style-type: none"> Increase advocacy around the school and community by involving more younger people in Zero Waste.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> Students would work closely with the Zero Waste Champions as they would be the lead representatives for the organization at the school and events.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Would likely use existing staff/employees (e.g., Zero Waste Advocates/Site Champions) so no job loss or creation would expect to occur.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> With increased awareness, it is likely that waste reduction would increase as well. The students can pass on what they learn in school to their households.



Option: Maximize Opportunities for Student Engagement	
Potential Cost Implications	<ul style="list-style-type: none"> Creating P&E materials for the Zero Waste curriculums for all FCPS locations could equate to about \$50,000.
General Implementation Requirements	<ul style="list-style-type: none"> While working with student volunteers, it may be necessary to have more staff involved than just the Zero Waste Champion.

2.2 Theme #2: Program Establishment

The following options involve establishing new or expanding current programs that will directly impact waste diversion rates and track the progress of implemented Zero Waste options.

2.2.1 Establish Zero Waste Team

Establishing Zero Waste Teams in both schools and County facilities can help create a culture around sustainability. Zero Waste Teams can bring students, teachers, and employees together in an environment which focuses on recycling more, generating less, and getting creative with solutions.

Table 2-7. Establish Zero Waste Teams

Option: Establish Zero Waste Teams	
Description of Option	<ul style="list-style-type: none"> A Zero Waste Team would require 6 new full-time positions within Fairfax County to implement Zero Waste practices within FCPS and County governments. A Zero Waste Team would plan and carry out institutional changes, systemwide policies and accountability, training for Zero Waste Champions, education, and assisting agencies with funding needs and strategy implementation.
Actions/Potential Challenges	<ul style="list-style-type: none"> Getting enough interested staff/employees to volunteer to be advocates. May need to offer incentives such as promotional giveaways/gifts to secure volunteers.
Benefits/Impacts	<ul style="list-style-type: none"> Zero Waste Team members can educate their peers on how to be more sustainable and that small changes can make big differences. Encourages coworkers and students when they see other familiar faces participating. The more consistent people are at school/in the workplace, the more likely they are to continue the routine at home.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> Zero Waste Teams will likely work closely with the Zero Waste Champions on education outreach programs. Zero Waste Teams are also likely to work with events held at schools/County facilities to support the “green” requirement. This will lead to working closer with student organizations.

Option: Establish Zero Waste Teams	
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • No job loss. • Unlikely to create new jobs, as most members of the Zero Waste Team will already be students or employees of the school system or County facilities.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • The goal of the Zero Waste Team is to put an emphasis on recycling efforts which will in-turn reduce the overall waste stream. • Per the visual audit results conducted by HDR, there is potential to divert over 25 percent of the waste stream (by volume) through organics separation/composting efforts.
Potential Cost Implications	<ul style="list-style-type: none"> • Zero Waste Teams would likely be made up of student/employee/staff volunteers and would not require additional pay. • A budget to support Zero Waste Teams, including creating and hosting events, advertisement and outreach efforts, and incentive promotional giveaways for volunteers, may accumulate costs up to \$100,000.
General Implementation Requirements	<ul style="list-style-type: none"> • Would need willing and passionate staff/employees to participate. • Would need to create Zero Waste Teams and identify members (possibly through emails, additional surveys, or outreach from SWMP and/or Zero Waste Champions). • Zero Waste Team funding would need to be allocated from annual budgeting.

2.2.2 Expand Sustainable Purchasing Program

Currently, Fairfax County utilizes the Environmental Preferable Purchasing (EPP) Policy to promote the reduction of waste and support environmental sustainability. The goal of this initiative is to expand the sustainable purchasing program throughout more departments in the County, including public schools. The EPP policy recommends purchasing departments buy supplies that are made of recyclable material, made more sustainably, or could be reused, or from suppliers who use less packaging material. This could be accomplished by targeting various levels of reusable packaging with individual product vendors/suppliers and/or by enacting a departmental or systemwide program using reusable containers. Incorporating specific metrics into the initiative (such as procuring x% of goods in reusable containers) would be helpful.

For example, as part of Fairfax County’s DPMM EPP Buyer’s Guide, it is suggested that each County entity purchase products that are durable, long lasting, reusable or refillable; request that their vendors eliminate packaging or use the minimum amount necessary for product protection to the greatest extent practicable; request packaging that is reusable, recyclable or compostable when suitable uses exist; and reuse packaging materials.² This can be accomplished by the County communicating with its current suppliers about its environmental objectives and Zero Waste goals to gauge interest among the suppliers. Likely, one or several of the suppliers will be willing to make a sustainable change to leverage its relationship with the County to become leaders in this space.³ As an example, Fairfax

² Fairfax County Environmentally Preferable Purchasing Buyer’s Guide. Department of Procurement & Material Management.

³ [Packaging waste 101: the solutions – Supply Chain Solutions Center \(edf.org\)](https://www.edf.org/zero-waste/packaging-waste-101-the-solutions)



County’s DPMM had a contract with Guernsey Office Supplies, for office products and toner, which offers a collection of environmentally friendly, “green” office products to purchase. Since this vendor (or others similar to it) already offers “green” products, it would likely be willing to make additional improvements to its packaging. It is suggested similar contract negotiations with other material suppliers for more sustainable packaging be made. It is further suggested the EPP Policy be enforced to directly support this option.

Table 2-8. Expand Sustainable Purchasing Program

Option: Expand Sustainable Purchasing Program	
Description of Option	<ul style="list-style-type: none"> • Guide departments and agencies to procure goods and services in alignment with Zero Waste principles such as materials and packaging reduction and reuse, bulk purchasing, product durability and repairability, extended producer responsibility/take-back, recyclability, and prioritizing suppliers that minimize or eliminate waste during manufacturing, integrate recycled content and/or support a circular economy. • Such procurement practices can be enabled by an enforceable sustainable purchasing policy, as well as other mechanisms such as standardized language for solicitations and contracts, Zero Waste specifications for targeted products and services, a Zero Waste purchasing guide, and pledges for agencies and/or key suppliers.
Actions/Potential Challenges	<ul style="list-style-type: none"> • Enforcing use of the EPP and EPP Buyer’s Guide without a Fairfax County Board of Supervisors (FCBOS) issued directive may be difficult. • Recycled/sustainable materials could potentially be more expensive than current materials. However, the purchase of sustainable products can stimulate demand and influence markets, which could in turn positively affect pricing and availability.⁴ • Getting vendors to agree to packaging changes in their operations and materials purchasing. This may involve contract re-negotiations. • Getting County staff/employees to actively participate in packaging reuse. This may require additional storage needs and trainings.
Benefits/Impacts	<ul style="list-style-type: none"> • Enforcing the sustainable purchasing program would increase the amount of reusable material that is circulated by either purchasing material with post-consumer recycled content or items from the local warehouse. • Would promote sustainable initiatives and set the standard for future County/third-party negotiated contracts. Vendors offering “green” products would be more likely to win contracts. • Mitigate the amount of packaging disposed after one use and the total amount of waste being landfilled. • Promotes sustainability and environmental stewardship.
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term • It would take time to identify vendors who could and would be willing to make changes to their packaging and operations. It could be timely if contract negotiations/re-negotiations are required.

⁴ “Fairfax County Green Purchasing Accomplishments”. Word document provided by Fairfax County.

Option: Expand Sustainable Purchasing Program	
Interaction with Other System Components	<ul style="list-style-type: none"> Enforcing the sustainable purchasing policy would work alongside newly established regulations banning single-use plastics. The potential need for increased budgets to purchase the more sustainable options would be incorporated through the expansion or reallocation of grant funding. Could imitate the process used at existing Reuse Centers (such as the Logistics Center Complex/ FCPS Central Warehouse).
Potential for Job Loss/Creation	<ul style="list-style-type: none"> One or two FTE staff could be hired to manage the Sustainable Purchasing Program The handling and storage of packaging material for reuse would likely fall under the responsibility of existing staff.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> By purchasing products that can be reused and are made from recycled material, single-use items are not bought and then thrown away and disposed of in a landfill. Part of the EPP also encourages vendors to reduce the amount of single-use plastic film as part of their packaging.
Potential Cost Implications	<ul style="list-style-type: none"> Although the change to more sustainable products may cost more, the overall cost savings in disposal or maintenance fees could outweigh the cost of purchasing single-use items. This would be determined during contract negotiations. One or two FTE staff could be hired to manage the Sustainable Purchasing Program.
General Implementation Requirements	<ul style="list-style-type: none"> Would require extensive County research on available vendors, contract negotiations, and planning development to implement sustainable packaging goals and targets for interested vendors. Would need to train staff/employees on packaging reuse and implement organized materials storage methods. Would likely require direct enforcement by the County, likely through enforcement of the EPP Policy to all County facility and FCPS entities. The County could also potentially work with the National Stewardship Action Council to establish extended producer responsibility (EPR) policies that would require vendors to reduce the packaging of their products that they sell to County departments.⁵

2.2.3 Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts

Establishing commitments by all County departments, including FCPS, is essential to ensure the Zero Waste Strategies implemented are being carried out. In addition, County departments may need assistance in developing these strategies such as funding and support.

⁵ [National Stewardship Action Council | United States \(nsaction.us\)](https://www.nsaction.us)

Table 2-9 Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts

Option: Establish Commitments by all County Departments and Schools to Participate in Zero Waste Efforts	
Description of Option	<ul style="list-style-type: none"> To ensure success of a Zero Waste program, commitment by schools and County departments to participate in the program is critical. Individual agencies will need funding for their Zero Waste efforts.
Actions/Potential Challenges	<ul style="list-style-type: none"> There may be some drawbacks due to potential repercussions if a department does not meet the goals set by the County. Proving all strategies to County departments and establishing a way to track commitments chosen by each department versus progress.
Benefits/Impacts	<ul style="list-style-type: none"> This option would hold County Departments and Schools accountable for their Zero Waste efforts
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> Having a Zero Waste Champion at each site would pair closely with this option, because as champion, they would be responsible for the program's well-being. Measuring success through programmatic reporting and waste audits will also support this strategy.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Establishing commitment from County departments is unlikely to create new jobs
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> With an established commitment by facilities and schools, a goal should be set to meet which would greatly impact waste diversion by requiring facilities and schools to meet their goals.
Potential Cost Implications	<ul style="list-style-type: none"> It is assumed participants of this strategy will be in a voluntary role made up of current staff or Zero Waste Champions. Making P&E materials to provide outreach on the different strategies chosen in the Zero Waste Plan.
General Implementation Requirements	<ul style="list-style-type: none"> Establishing a way to monitor the commitments made by each department and tracking their progress on a set basis.

2.2.4 Establish Programmatic Reporting of Activities by County Departments and Schools

The FCBOS could require County facilities and schools to report materials diversion rates quarterly (ideal) or annually to track the progress of implemented Zero Waste strategies/programs and directly gauge their effectiveness. Currently within the County, the Department of Public Works Environmental Services-Solid Waste Management Program (DPWES-SWMP) Newington Collection Complex tracks daily recycling volumes for both commingled recyclables and yard waste. The County's Logistic Center Complex manages and monitors the reuse/sale of surplus and plans to pursue Zero Waste Certification which would formalize its data tracking procedures. As part of the Green Business Certification Inc.'s (GBCI) TRUE Rating System, one way to receive credit towards Zero Waste

Certification through Zero Waste reporting is to compile monthly data of each commodity and waste stream, showing overall annual average diversion rates (based on weight) from a landfill, incinerator or the environment of 90 percent or better.⁶ Requiring monthly hauling data differentiating between disposed and diverted data from contracted entities, both public hauling for County facilities and private hauling for County schools, could be the long-term goal, but quarterly reporting would be much easier to manage for a newly implemented requirement. The FCBOS requiring self-reporting from each entity, likely based on hauling data, could create a detailed vast database of diversion rates and better pinpoint exactly where improvements could be made through allocated funding and program planning.

Table 2-10 Establish Programmatic Reporting of Activities by County Departments and Schools

Option: Establish Programmatic Reporting of Activities by County Departments and Schools	
Description of Option	<ul style="list-style-type: none"> Establish a system and protocol for County facilities and schools to assess and report on their waste generation, Zero Waste goals. Additionally, facilities and schools can report progress made toward Zero Waste and initiate requests for resources needed.
Actions/Potential Challenges	<ul style="list-style-type: none"> Getting each County facility and school to actively participate in self-reporting. Getting haulers (both public and private) to agree to report diversion rates quarterly and report on multiple specific material categories. Would take additional staff effort to make a standardized electronic reporting system.
Benefits/Impacts	<ul style="list-style-type: none"> Would likely create a detailed vast database of diversion rates that would help better identify which entities could improve and possibly which materials could be recovered better. Would hold facilities and schools accountable for their Zero Waste programs.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term This requirement would ideally come from a FCBOS-issued directive. Prior to that, a standardized reporting method template and process would need to be developed and County entities (i.e. designated Zero Waste Advocates/Champions) trained on how to report. Private hauling contracts may also need to be renegotiated to include quarterly reporting.
Interaction with Other System Components	<ul style="list-style-type: none"> Zero Waste Champions would likely be responsible for tracking and reporting. The results directly gauge the success of the implemented waste diversion programs supporting the commitment that was established for the Zero Waste effort.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Would mainly fall under the responsibility of existing staff designated as the Zero Waste Champions but may need to hire someone part-time to prepare quarterly diversion reports.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> The reporting results could identify more specific materials to target for landfill diversion through recycling, reuse, or recovery.
Potential Cost Implications	<ul style="list-style-type: none"> Advocates/Champions may want or need to be incentivized in order to participate in self-reporting. A 0.15 FTE may be needed to prepare the quarterly diversion reports for County businesses and schools (\$18,000 per year).

⁶ [TRUE_RatingSystemGuide_02.10.2021.pdf \(gbc.org\)](#)

Option: Establish Programmatic Reporting of Activities by County Departments and Schools	
General Implementation Requirements	<ul style="list-style-type: none"> The FCBOS would need to approve this reporting requirement and an entity (possibly the SWMP or DPMM) would need to enforce it. That entity would also need to standardize the reporting system initially and evaluate and keep record of all reporting after implementation. Reporting could be through electronic means to avoid the use of printed paper manipulatives.

2.2.5 Measure Success: Waste Audits, Reporting, Facility Assessments

Visual waste and recycling audits (on a per volume basis) were conducted at 20 locations as part of the Zero Waste initiative to gather insight into the current baseline conditions of waste management in Fairfax County government facilities, parks, public places and schools. The purpose of the audits was to identify which materials could be diverted from landfilling through recycling, reuse or recovery as well as which materials were contaminating the recycling stream. The results were then ultimately used to identify options that could be implemented to best improve diversion rates and reduce contamination rates. As a way of tracking progress of implemented options, it is suggested waste audits that follow statistical American Society for Testing and Materials (ASTM) D5231⁷ methodology be conducted every three to five years to gauge whether diversion rates are improving and contamination rates are reducing and to track progress.

Table 2-11 Measure Success: Waste Audits, Reporting, Facility Assessments

Option: Measure Success: Waste Audits, Reporting, Facility Assessments	
Description of Option	<ul style="list-style-type: none"> The Zero Waste Team and other stakeholders must conduct a systemwide waste audit/characterization statistical study (following ASTM methodology) every 3 to 5 years to gauge the success of implemented waste diversion options and track progress and milestones. In addition, annual self-assessments and reporting should be required to track overall success.
Actions/Potential Challenges	<ul style="list-style-type: none"> Would likely need to hire a third-party to conduct the audits. Audits would need to be conducted in multiple locations, keeping in mind spatial, any additional Fairfax County staffing, and scheduling needs.
Benefits/Impacts	<ul style="list-style-type: none"> Establishes a routine and accurate way of tracking the success of implemented diversion efforts. ASTM methodology follows a specific protocol that should generate accurate and defensible results.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term It is suggested waste audits be conducted every 3 to 5 years. Waste audits could also be conducted at a minimum twice during selected years to account for seasonal changes.

⁷ [ASTM D5231 - 92\(2016\) Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste](#)

Option: Measure Success: Waste Audits, Reporting, Facility Assessments	
Interaction with Other System Components	<ul style="list-style-type: none"> Audits would be a part of the commitment made by County facilities and schools to participate in Zero Waste efforts. The results directly gauge the success of the implemented waste diversion programs. Procurement could secure a contract with third-party auditors and Zero Waste Champions would likely be responsible for finding any needed volunteers and hosting sorting events.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> A third-party would likely be used and any County staff assisting would likely already be employed.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> The results of the audits could identify more specific materials to target for landfill diversion through recycling, reuse, or recovery.
Potential Cost Implications	<ul style="list-style-type: none"> Each waste audit that follows ASTM methodology typically ranges from \$30,000 to \$50,000. This amount would assume to be doubled if audits were conducted twice during the selected year to document seasonal variations.
General Implementation Requirements	<ul style="list-style-type: none"> The number and specific locations of government facilities, parks, public places, and schools would need to be identified. A third-party consulting company would likely need to be hired to conduct the audits.

2.2.6 Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships

The goal of this initiative is to partner with local and/or national businesses, non-profits, and other local governments to achieve symbiotic goals. Fairfax County has several reuse and donation programs that are run by local organizations. The intent of expanding alternative recycling program partnerships is to reach Fairfax County’s goal of achieving Zero Waste by 2030. Current non-typical recycling programs active in some public schools include plastic bag recycling, chip bag and juice pouch recycling, and marker recycling. This option would require more facilities to incorporate these programs and adopt other programs to increase the diversion rate from the landfills.

The County’s current Logistics Center Complex and FCPS’s Central Warehouse/Forte Center diverts unwanted but reusable materials from landfills. The Zero Waste operations of the warehouses incorporate vehicles, scrap metal, recyclable material, and single-source material. These programs could be expanded through additional reuse centers or by calling more attention to current operations.

A systemwide backhauling program to recover recyclable materials could also be implemented for landfill diversion. Key, high-value recyclables could be targeted to extract better revenue from these commodities. For example, backhauling options with DPMM’s Logistics Center Complex or FCPS’ Central Warehouse/Forte Center could be explored to directly collect cardboard from facilities/schools and store it at their warehouses either for reuse or for recycler pick-up. Clean cardboard is a highly valued commodity that retails for an average of about \$95 per ton⁸.

⁸ [Recycling Markets - Secondary Fiber Online®](#)

Table 2-12. Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships

Option: Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	
Description of Option	<ul style="list-style-type: none"> Establish or expand current alternate recycling/reuse/recovery programs for all schools and government facilities. Establish more programs to include other recyclable material that is not currently accepted as part of conventional recycling efforts, including C&D debris. Partner with local and/or national businesses, non-profits, and other local governments to help reach Zero Waste goals. Seek out new and innovative solutions within the business community that can help reach Zero Waste goals.
Actions/Potential Challenges	<ul style="list-style-type: none"> To expand collection programs at more facilities, budgets would need to be increased to allow for new contracts. The County can support the idea of an established reuse center that collects a broad range of materials that is not currently accepted in their recycling program. For example, plastic film could be collected at the Logistics Center Complex as a vendor has been identified that will purchase the plastic film if the aggregated tonnage reaches a certain amount. The Logistics Center Complex currently does not produce enough plastic film on its own to reach this necessary amount. The County could consider additional promotion of existing reuse opportunities, such as independent reuse centers and the Logistics Center Complex and FCPS Central Warehouse program, through outreach efforts. Negotiating contracts with County warehouses to backhaul recyclable materials from County facilities and FCPS locations while also ensuring the warehouses & facilities have enough available storage capacities.
Benefits/Impacts	<ul style="list-style-type: none"> The expansion of recycling/reuse programs would increase the diversion rate of non-traditional recycled materials. Backhauling of recyclable materials could generate increased revenue for cleaner, separated materials.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> Expanding current programs would interact with the goal to conduct annual waste audits, by closely monitoring the waste on a collection basis. As budgeting may become an issue with expanding programs, grant funding could help the schools/facilities overcome this issue. Education on additional recyclable items would need to be provided by the Zero Waste Advocates/Green Teams to ensure that students and staff understand that a new item they thought was waste can now be separated to be recycled. Reuse Center – The Logistics Center Complex/FCPS Central Warehouse (Forte Center) is a prime example of sustainable reuse and could teach other entities best practices. This option could expand on the current operations at the Logistics Center Complex and FCPS Central Warehouse. Backhauling services could be added to operations.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Add an internal position to oversee this option. Backhauling option could require additional staff at Logistics Center Complex and FCPS Central Warehouse.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Expanding current diversion programs to more facilities should decrease the amount of recyclable material entering the waste stream.

Option: Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	
Potential Cost Implications	<ul style="list-style-type: none"> The expansion of programs into all schools and County facilities would require additional funding to pay for third-party contracts. Assuming 1 FTE job to overlook, educate, and manage the program, staffing would be approximately \$120,000. Assume 2 FTE jobs for a systemwide backhauling program would be approximately \$240,000. Initial capital cost of outreach and educational briefings of new programs would be approximately \$25,000.
General Implementation Requirements	<ul style="list-style-type: none"> Would need to identify and establish contracts with alternative recycling programs/vendors. SWMP will have to do research on haulers collecting additional recyclable items to learn the most efficient way to collect the highest amount of materials. Additional education will be needed if new sorting bins are established at schools and facilities to reduce contamination. Resources such as staff time to research programs and partners and to promote the center. Support activities by providing education on the County website. Would require County warehouses to agree to participate in systemwide backhauling of key recyclable materials produced at County facilities and FCPS locations.

2.2.7 Launch a Reusable Packaging Program

Approximately 60 percent of Fairfax County’s recycling is made up of cardboard (by volume) per the recycling audit. Cardboard is a highly durable material and boxes are able to be reused multiple times. By reusing cardboard packaging, the amount present in the recycling stream and waste stream would likely decrease.

The FCPS Central Warehouse/Forte Center (Warehouse) is a current working example of how packaging reuse could work. The Warehouse carefully removes items purchased in bulk from its cardboard packaging and separates the items into individually categorized storage bins. When a school requests multiple products, the needed items are grabbed and packaged using one of the cardboard boxes used in the original delivered packaging. The cardboard boxes are carefully broken down and stored in a specific location in the Warehouse until it is needed for reuse. This example of saving shipment packaging for reuse could be implemented at individual County entities or department wide.

A reusable packaging program should also be specified for any goods provided by vendors. As a part of standard procurement contracts, a vendor could be incentivized or required to provide packaging that can either be returned to the vendor or reused in other ways by the County and FCPS.

It was noted during the audit that the Warehouse contained a large amount of plastic film for shipping wrap that is discarded in the waste stream. The current MRF cannot handle plastic film, however, a local recycling facility has the capability. When previously discussed during the audit, the Warehouse alone does not have the required amount of plastic to be sent to the facility. If Fairfax County coordinates with other facilities to collect additional plastic film, it is likely that there would be enough plastic film collected to be able to use the local recycler as a resource and divert additional waste from entering landfills.

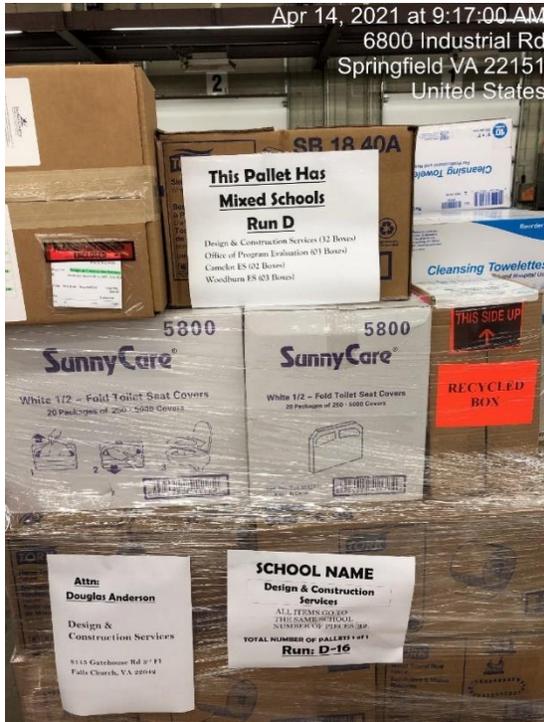


Figure 2-1. FCPS reuses bulk product packaging for future shipments.



Figure 2-2. Bulk items are removed from initial packaging and stored in individual organized containers.



Figure 2-3. Cardboard boxes and pallets are saved for reuse.

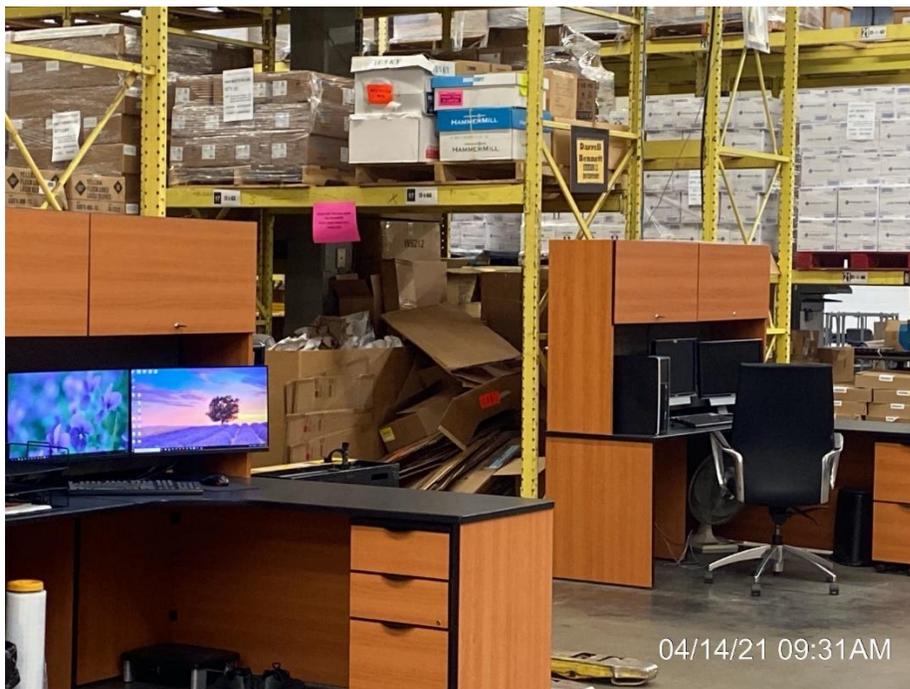


Figure 2-4. Cardboard boxes are saved and stored for eventual reuse.

Table 2-13 Launch a Reusable Packaging Program

Option: Launch a Reusable Packaging Program	
Description of Option	<ul style="list-style-type: none"> Incentivize and incubate reusable packaging systems with key suppliers, including building on FCPS and County warehouses' existing reuse practices.
Actions/Potential Challenges	<ul style="list-style-type: none"> Suppliers may charge more for reusable material or new suppliers would need to be researched and contracts negotiated with reusable packaging. Local facility that recycles plastic packaging requires a certain amount be collected before being accepted.
Benefits/Impacts	<ul style="list-style-type: none"> Divert packaging material from disposal or recycling to reuse.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> This program would work with the sustainable purchasing program to research the packaging material that will be used in shipments of supplies. Work with other facilities to collect the required amount of plastic packaging to be recycled at the local facility. The single-use plastic ban would play an important role in packaging material, requiring more durable options that can be used multiple times.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> There is unlikely potential for job creation as the responsibility of this organization would be a County employee already responsible for contracts. Members working on the alternate recycling, reuse, and recovery program partnership are also likely to coordinate the quantity of plastic wrap at each facility.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Over time, this would reduce the amount of waste going into the waste stream due to packaging materials being used more than once. Collecting the County's plastic packaging that is unable to be used again and sending to the local recycler would divert a large amount of recyclable material that cannot be processed at the MRF.
Potential Cost Implications	<ul style="list-style-type: none"> Initially the upfront cost may be more as procurement finds a supplier that will work with the program. However, over time it is likely that the cost will decrease with the decreased amount of packaging supplies necessary No additional FTE should be required as this task would be a part of procurement responsibilities.
General Implementation Requirements	<ul style="list-style-type: none"> Finding the right supplier and generating a contract that will have the material used as many times as possible before losing its durability.

2.2.8 Establish or Expand Edible Food Rescue and Donation Program

The United States Environmental Protection Agency (EPA)⁹ and other nationwide organizations¹⁰ have adopted food rescue programs that donate edible leftover cafeteria food to shelters, food banks, and other organizations that can utilize edible food. This initiative can help Fairfax County adopt similar programs, strategies, and techniques to become successful in food rescue. The EPA's Food Recovery Hierarchy is shown in Figure 2-5.

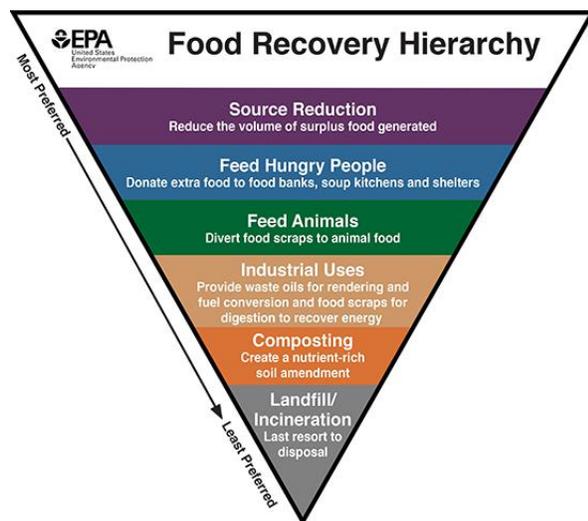


Figure 2-5. EPA Food Recovery Hierarchy

Table 2-14. Establish or Expand Edible Food Rescue and Donation Program

Option: Establish or Expand Edible Food Rescue and Donation Program	
Description of Option	<ul style="list-style-type: none"> Expand food rescue and donation programs at schools and introduce programs to County governments. Unused food from primarily school cafeterias and government buildings can be donated to food banks and local shelters.
Actions/Potential Challenges	<ul style="list-style-type: none"> Determining the quantity and quality of food to be collected. Identifying organization that can utilize edible food. Determine the logistics of collecting and delivering edible food.
Benefits/Impacts	<ul style="list-style-type: none"> The food rescue program would benefit the surrounding community by providing fresh edible food that would have gone to waste and then a landfill for disposal. More people benefit from the food that is currently available. Less organic waste enters the waste stream.

⁹ [https://www.epa.gov/sustainable-management-food/reduce-wasted-food-feeding-hungry-people#:~:text=Food%20Recovery%20Network%20\(FRN\)%20Exit,food%20to%20food%20insecure%20communities](https://www.epa.gov/sustainable-management-food/reduce-wasted-food-feeding-hungry-people#:~:text=Food%20Recovery%20Network%20(FRN)%20Exit,food%20to%20food%20insecure%20communities)

¹⁰ <https://www.feedingamerica.org/our-work/our-approach/reduce-food-waste>



Option: Establish or Expand Edible Food Rescue and Donation Program	
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> • This program could work with the Board-directive for organics/food disposal ban, not allowing fresh, edible food to be sent to waste. Also, food that is not deemed high-quality could be sent to organics collection and processing rather than the waste stream.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • There is potential for job creation. There is a need for a company to collect all the remaining food and deliver to the local shelters.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • Based on the EPA's Feeding America, in 2020, 4 billion pounds of groceries, including 1.8 million pounds of fresh produce was rescued and delivered to homes and shelters in need of food.¹¹ While the County and FCPS impact will be a portion of that, food diversion can be directly measured.
Potential Cost Implications	<ul style="list-style-type: none"> • This would require additional employee assistance, estimating 0.25 FTE costing \$30,000. • P&E such as flyers, web support, and other outreach materials would equate to about \$25,000. • In total, this initiative would cost about \$55,000 during the first year.
General Implementation Requirements	<ul style="list-style-type: none"> • The potential need for regulations/policies on the quality of food to donate.

¹¹ [Fighting Food Waste in America | Feeding America](#)

2.3 Theme #3: Facility Upgrades

The following options involve improving each facility that will directly impact waste diversion rates by installing and implementing more Zero Waste management options.

2.3.1 Design and Retrofit for Zero Waste

Design and retrofit projects for County facilities and schools should include consideration and analysis of impact on Zero Waste. Configurations of facilities should include space for Zero Waste stations within the buildings. Loading dock and materials management areas should be designed to accommodate additional space that may be needed for diversion and Zero Waste.

Table 2-15 Design and Retrofit for Zero Waste

Option: Design and Retrofit for Zero Waste	
Description of Option	<ul style="list-style-type: none"> Design and retrofit projects should include consideration and analysis of impact on Zero Waste. Configurations of facilities including for diversion and waste management activities and addition of Zero Waste stations should be part of considerations. Loading dock and materials management areas should be designed to accommodate additional space that may be needed for diversion and Zero Waste.
Actions/Potential Challenges	<ul style="list-style-type: none"> Additional design considerations must be made for areas for diversion when County and FCPS facilities are initially designed or retrofitted. Diversion activities including reuse and recycling may use additional space that will no longer be able to be utilized for other purposes.
Benefits/Impacts	<ul style="list-style-type: none"> Designing with Zero Waste in mind will benefit in increased opportunities to decrease waste sent to landfill. Additional space dedicated to Zero Waste may result in less available space for primary building activities. Opportunities for diverting additional material may decrease overall waste and create additional space for diversion activities.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> Design and retrofit for Zero Waste could work with the Office of Environmental and Energy Coordination Silver LEED certification for projects greater than 10,000 square feet¹². Building and remodeling with diversion in mind is one of the opportunities for LEED.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Limited potential for job creation.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Providing space and infrastructure for diversion activities and Zero Waste will potentially have a significant positive impact on diversion rates.

¹² <https://www.fairfaxcounty.gov/environment-energy-coordination/green-building>

Option: Design and Retrofit for Zero Waste	
Potential Cost Implications	<ul style="list-style-type: none"> The addition of square footage for diversion activities either through remodeling an existing building or a new building will likely have a cost impact. Each project should be evaluated on its own with an understanding that LEED building may add cost. Reduction of waste and increases in diversion may result in less costs over time, however it is unknown the extent of these potential cost changes.
General Implementation Requirements	<ul style="list-style-type: none"> Similar to the current required Silver LEED certification for new buildings over 10,000 square feet, standards and expectations for access to infrastructure for diversion should be developed for building of smaller facilities and remodeling of existing facilities. A Board-directive to design and retrofit with adequate space for Zero Waste will require buildings to provide areas for diversion activities.

2.3.2 Standardize and Increase Waste Receptacles and Signage

Incorrect labeling of waste/recycling/organics receptacles and not having enough receptacles causes reduction in diversion due to user error and less participation in appropriate materials placement. For example, the County has single-stream recycling. If only bottle and can receptacles appear to be present, then the recycling stream is missing valuable paper collections and vice versa. Consistent user experience both within facilities and across facilities with respect to waste diversion receptacles is important to program success. Both receptacles should either be presented together or replaced with one centralized blue container with clear signage for all accepted recyclable materials. Figure 2-6, Figure 2-7, Figure 2-8, and Figure 2-9 show additional County-specific examples of where improvements and standardization could be made.

This option is one of the easier and more straight-forward options to implement. The most time-consuming part is evaluating each County facility (including parks) and FCPS locations for what each one needs in terms of additional recycling and/or compost bins, enhanced or new exterior dumpsters, additional labeling and appropriate signage placement. It is recommended that designated Zero Waste Advocates/Site Champions in charge of each facility be responsible for evaluating their assigned locations for their current needs.



Figure 2-6. Incorrect labeling of trash can as composting container.



Figure 2-7. Only having bottle and can blue recycling containers in the vicinity makes users believe paper is not collected.



Figure 2-8. Incorrect labeling of exterior County dumpster; the County has single-stream recycling and also collects bottles/cans. The dumpster could also be painted blue to clearly indicate it is a recycling receptacle.



Figure 2-9. Cardboard slots on exterior dumpsters makes user believe only cardboard is accepted. Suggest replacing or enhancing existing exterior recycling dumpsters to not have or indicate cardboard slots.



Figure 2-10. Elite ErgoCan Three-Stream Station¹³

Table 2-16. Standardize and Increase Waste Receptacles and Signage

Option: Standardize and Increase Waste Receptacles and Signage	
Description of Option	<ul style="list-style-type: none"> Reduce contamination and increase diversion in overall materials stream using standardized, additional, or improved recycling and/or composting interior bins and exterior dumpsters and appropriate/strategic signage, container coloring and placement. Standardize containers throughout the County for consistent user experience with waste diversion receptacles. Design for Zero Waste, so that existing bins can be used as long as possible. Signage should be designed for customization depending on each County or FCPS facility's waste composition.
Actions/Potential Challenges	<ul style="list-style-type: none"> Trash and recycling collection are handled by separate entities between County facilities and FCPS locations (private hauler). The same types of collection containers are not used throughout the County which can lead to confusion as to how materials are sorted and what is accepted. People want to be able to recycle but often there are a lack of containers or containers lack visual cues or signage. Each County facility and school would need to be evaluated for whether they need additional bins, changes to bin/dumpster types, additional or corrected signage, etc. This could potentially be conducted through surveys.
Benefits/Impacts	<ul style="list-style-type: none"> Signage more clearly identifying appropriately accepted items on or above each container will likely improve contamination and diversion rates. Giving access to more recycling and/or composting bins will improve usage due to increased convenience and capacity.

¹³ [Recycling, Waste & Compost Station | Trash and Recycle Bins | Recycle Away](#)



Option: Standardize and Increase Waste Receptacles and Signage	
Short-term or Long-term Option	<ul style="list-style-type: none"> • Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> • Continuous waste audits will help track the success after option implementation. • Increased compost bins and signage would be required if the current Composting Pilot Program is expanded. • As an educational outreach tool, FCPS students could create their own recycling/composting signs.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • Limited potential for job creation.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • Appropriate materials disposal/collection into appropriately and clearly labeled containers will increase landfill diversion/recovery, saving landfill space and reduce contamination.
Potential Cost Implications	<ul style="list-style-type: none"> • Cost for additional containers for specific materials (e.g., recyclables and/or organics). Costs vary by type of container. • Cost to update or customize appropriate signage. • Cost to maintain containers. • Cost to fix and/or replace exterior dumpsters with ones that have working lids to block rain and vectors, appropriate and clear labeling/coloring, and removal of cardboard container slots. • Additional collection costs to empty containers if exterior dumpsters fill up more quickly due to an increased number of interior containers. • It is assumed that to add bins, replace and/or enhance dumpsters and correct signage would be about \$1,000 per location. Assuming half of County facilities (including parks) and FCPS locations (about 250 buildings) receive upgrades in the short-term, this would equate to about \$250,000. Annual operations and maintenance (O&M) costs is assumed to be 10 percent of that, so \$100 per building per year, or \$25,000 total. Full implementation across all locations would double these cost estimates.
General Implementation Requirements	<ul style="list-style-type: none"> • Ensure that every bottle and can designated blue rectangular receptacle has a mixed paper receptacle next to it, and vice versa. Another option would be to provide one large single-stream blue container for all recyclables. This will mitigate user questions of whether a common recyclable material (e.g., paper or plastic bottle) is accepted or not, as both typically are. Three-stream container units could be deployed that clearly label trash, composting and recycling. (Refer to Figure 2-10 for an example). • Maintain same coloring scheme for all bins and dumpsters. For example, MSW would be black, recycling would be blue, and organics would be green. • The County could apply for grant funding from outside entities (e.g., Keep America Beautiful, Subaru or America) to purchase bins or update signage.

2.3.3 Implement Reusable Food Service Ware

It was recognized during the conducted waste audits that the garbage consisted of a lot of single-use plastic cutlery and paper plates. Reducing the amount of single-use materials used and disposed of and implementing reusable serviceware (e.g., silverware and dishware) into school kitchens, cafeterias, and staff kitchens would reduce environmental impacts through production, distribution, and disposal.

Installing dishwashers in small staff/employee kitchens/breakrooms or larger commercial kitchens serving cafeterias (e.g., government centers and schools) would directly complement and promote the use of reusable silverware/dishware in lieu of single-use disposable materials (typically non-recyclable plastic or paper).

Table 2-17. Implement Reusable Food Service Ware

Option: Implement Reusable Food Service Ware	
Description of Option	<ul style="list-style-type: none"> Implement the use of reusable service ware in school kitchens, cafeterias, and staff kitchens to reduce or entirely remove the amount of single-use serviceware purchased and disposed of. Adding or installing dishwashers where practical to County facility and/or school kitchens will promote the use of reusable serviceware and dishware, instead of single-use materials. Long term cost savings may be significant.
Actions/Potential Challenges	<ul style="list-style-type: none"> Disposable serviceware has increased in popularity due to its convenience and potential hygienic benefits, especially during the COVID-19 pandemic. Switching to reusable silverware, plates, cups, trays, etc., would require additional work of collecting and cleaning the items to be reused, while there would be less work needed in receiving, unpacking, and disposing of single-use serviceware and its packaging. Reusable silverware may be thrown away by individuals who are not aware that it is reusable. Each County facility and school would need to be evaluated for if there are existing dishwashers. The size of dishwasher needed will need to be determined. Standards could be set for size of staff kitchen areas, commercial area for school kitchens, and number of meals served. This could potentially be conducted through a survey by Zero Waste Champions. Each building's electricity and plumbing sources would need to be evaluated to determine feasibility of dishwasher installation. While long-term savings from using high-quality, durable serviceware could be significant, the equipment and installation requirements can be costly upfront investments During the waste audits, employees appeared to want dishwashers but were wary of costs
Benefits/Impacts	<ul style="list-style-type: none"> The major impact of reusable food/beverage serviceware is the reduction of single-use waste in the waste stream. Reduces the need for individual food/beverage packaging (e.g., could buy milk in larger containers and pour into reusable cups instead of buying individual smaller milk cartons). Promotes environmental stewardship.

Option: Implement Reusable Food Service Ware	
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term • It will take some time to properly identify which locations should receive dishwashers. A few locations could be chosen every year for installation, pending available funding and budgeting.
Interaction with Other System Components	<ul style="list-style-type: none"> • The introduction of reusable serviceware would benefit with the introduction of dishwashers in cafeterias or staff kitchens.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • This option has the potential to create jobs in cafeteria kitchens. • If a dishwasher is purchased, an additional person may be needed to collect all dirty dishes, restock clean dishes, etc.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • Removing disposable food serviceware from the waste stream would have a direct positive impact on waste reduction.
Potential Cost Implications	<p>Reusable Silverware</p> <ul style="list-style-type: none"> • Assuming 50 percent of schools and government offices switch to reusable serviceware including 25 percent additional inventory of silverware, plates, and cups are purchased per person (95,000 students, 15,000 school staff, and 6,000 government staff) the total cost for forks, knives, spoons, cups, and plates would be about \$509,000. • The cost of reusable silverware and dishware will eliminate the cost for disposable utensils, cups and plates. • At least one 0.5 FTE may be needed to help in collecting and washing silverware at each cafeteria at a cost of approximately \$60,000/year. <p>Dishwasher</p> <ul style="list-style-type: none"> • For employees and staff, a built-in common household dishwasher could be installed in breakrooms or small kitchenettes. Built-in dishwashers typically have two 24-inch-wide racks and typically range from \$300 to \$1,000 in cost per unit. Installation labor costs for just the unit typically range from \$110 to \$270. If plumbing pipes need to be installed, the cost is an additional \$600 to \$1,600 per fixture.¹⁴ Any necessary retrofitting (e.g., countertop installation, cabinet removal or replacement, electrical outlet installation) would be additional cost. • For commercial dishwashers in kitchens for schools and government buildings with large amounts of staff and visitors, the cost ranges depend on the size needed. For small commercial operations, under-counter dishwashers are capable of running 20 to 30 racks per hour (e.g., 24 racks equate to approximately 600 dishes and 864 glasses per hour¹⁵) and typically retail for \$2,000 to \$7,000. For mid-size operations, door-type dishwashers are capable of running 60 to 75 racks per hour (e.g., 63 racks equate to approximately 1,134 dishes per hour and typically retail for \$2,500 to \$11,000. For large-size operations, conveyor dishwashers are capable of running 225 racks per hour (e.g., 202 racks equate to 5,025 dishes and 8,045 glasses

¹⁴ [2021 Dishwasher Prices & Installation Costs - HomeAdvisor](#)

¹⁵ [Commercial Dishwashers & Accessories Buyers' Guide \(katom.com\)](#)

Option: Implement Reusable Food Service Ware	
<p>Potential Cost Implications (continued)</p>	<p>per hour and typically retail for \$13,000 to \$25,000.¹⁶ It is assumed installation costs would range from \$1,000 to \$2,500 per dishwasher.¹⁷</p> <ul style="list-style-type: none"> • The electrical costs to operate a dishwasher can range from \$100 to \$700 per year based on size and frequency.¹⁸ • The average commercial dishwasher typically uses 4 gallons of water per rack.¹⁹ Assuming water costs \$0.01 per gallon and the dishwasher operates 3 times per day, the annual cost to use water for a common small dishwasher is about \$65 and about \$625 to \$7,000 for a commercial dishwasher. • Dishwashers typically last for 10+ years before needing replacement. • In summary, the capital costs including installation for a common small dishwasher is expected to range from \$1,000 to \$3,000 each, and O&M costs are approximately \$200 per year. Assuming 50 percent of all County facilities (including park facilities) and public schools, which would be about 150 County facility locations and 100 FCPS locations, would each receive one new small dishwasher for staff, the total capital cost (with installation) for the maximum scenario would be about \$750,000 and the total annual operating & maintenance cost would be about \$50,000. • In summary, the capital costs with installation for commercial dishwashers, depending on capacity needed, is expected to range from \$3,000 to \$27,500 each, and O&M costs are approximately \$1,325 to \$7,700 per year. Assuming 50 percent of all County facilities (including park facilities) and public schools, which would be about 150 County facility locations and 100 FCPS locations, would each receive one new commercial dishwasher, the total capital cost (with installation) for an average scenario would be about \$3.8 million and the total annual operating & maintenance cost would be about \$1.0 million.
<p>General Implementation Requirements</p>	<ul style="list-style-type: none"> • Facilities need to have enough storage for reusable serviceware. • Funding is needed to purchase materials such as reusable silverware. • Identify locations that could use dishwashers and which type (dependent on needed capacity). • Evaluate buildings for installation ease and feasibility. • Hire plumbers and potentially electricians for installation. • Train kitchen staff to utilize dishwashers and develop operating schedule/procedure. • Utilize reusable dishware/silverware and change habits of staff/employees/students.

¹⁶ [Selecting a Commercial Dishwasher - Active Element](#)

¹⁷ [Compare Dishwasher Installation Cost | 2021 Costimates.com](#)

¹⁸ [Electricity usage of a Dishwasher - Energy Use Calculator](#)

¹⁹ [Ways to Improve Commercial Dishwasher Efficiency | Quick Servant](#)



2.3.4 Install Additional Air Hand Dryers

Installing additional air hand dryers in the bathrooms of public schools and County facilities would greatly reduce the quantity of paper towels being used. From the conducted visual waste audit, it was estimated that an average of 25 percent of the waste (by volume) was made up of other compostables, most of which consisted of low-grade paper (e.g., paper towels). Hand dryers are a sustainable alternative as newer versions are more energy efficient. In addition to reducing waste by switching to hand dryers, facilities could potentially save money as purchasing hand dryers would be a one-time cost (replacement would not likely be needed for 10+ years) instead of buying paper towels on a weekly/monthly basis. Additionally, the annual O&M cost could be significantly less than continued purchasing of single-use paper towels.

Table 2-18. Install Additional Air Hand Dryers

Option: Install Additional Air Hand Dryers	
Description of Option	<ul style="list-style-type: none"> Air hand dryers are more sustainable compared to paper towels in bathroom facilities. Long term cost savings may be significant.
Actions/Potential Challenges	<ul style="list-style-type: none"> Funding to buy and install new hand dryers. Electrical fittings may need to be installed increasing installation costs.
Benefits/Impacts	<ul style="list-style-type: none"> Potentially less expensive than annually purchasing paper towels. Reduce single-use paper towel waste from entering the waste stream.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> If a composting/organics ban is implemented, switching to hand dryers will help get rid of the need for paper towels.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> No jobs are anticipated to be lost or created.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Ideally eliminate paper towel waste from County and FCPS facility bathrooms.

Option: Install Additional Air Hand Dryers	
Potential Cost Implications	<ul style="list-style-type: none"> Based on complexity, air hand dryers can range from \$400 to \$600 per unit.²⁰ It is assumed installation costs will be 10 percent of that, or \$40 to \$60 each. Cost of electricity - \$0.22/hour.²¹ It is assumed each hand dryer would run for a total of 2 hours per day (each unit runs for 30 seconds, 2 cycles each, 10 people per hour). Assuming 50 percent of all County facilities (including park facilities) and public schools, which would be about 150 County facility locations and 100 FCPS locations, would each receive 10 new air hand dryers, the total capital cost with installation for the maximum scenario would be about \$1.65 million and the total annual O&M cost would be about \$286,000. Comparatively, a family of four typically uses 2 rolls of paper towels every week, or 0.5 rolls per person. Assuming a 2-roll pack sells for \$5, this would be about \$1.25 per 0.5 rolls per week. Half of all County staff and FCPS students and staff is about 116,000 total people. This would equate to approximately \$2.9 million worth of paper towels every year (accounting for schools being open for 40 weeks out of year).
General Implementation Requirements	<ul style="list-style-type: none"> An inventory will need to be taken around each school and facility to confirm if a bathroom needs an air hand dryer.

2.3.5 Install Additional Bottle Filling Stations

The installation of more automatic, touchless and filtered bottle filling stations at County facilities and schools as shown in Figure 2-11 will help promote the use of reusable water bottles in lieu of single-use plastic water bottles. In schools, this effort would encourage staff and students to “bring your own bottle” (BYOB). Existing standard water fountains as shown in Figure 2-12 could be replaced with these new automatic bottle filling stations. While standard water coolers could also be supplied, the bottle filling stations would not require the continued replacement of the plastic water jugs and would therefore generate less waste. Refer to Figure 2-13.

²⁰ <https://www.prodryers.com/shop-by-brand/excel-dryer/xlerator-hand-dryers/>

²¹ <https://www.exceldryer.com/wp-content/uploads/2019/02/Cost-Savings-Analysis-Dynamic.pdf>



Figure 2-11. Installed Bottle Filling Station at a Current FCPS Middle School (spout currently inoperable due to COVID-19 health and safety regulations).



Figure 2-12. Standard Water Fountain.



Figure 2-13. Standard Water Cooler.

Table 2-19. Install Additional Bottle Filling Stations

Option: Install Additional Bottle Filling Stations	
Description of Option	<ul style="list-style-type: none"> • Install more automatic, filtered bottle filling stations in County facilities and schools to encourage the use of reusable water bottles in lieu of single-use plastic water bottles.
Actions/Potential Challenges	<ul style="list-style-type: none"> • Each County facility and school would need to be evaluated as to if there are existing bottle filling stations or not. This could potentially be conducted through a survey by Zero Waste Advocates/Site Champions. • Each building’s electricity and plumbing sources would need to be evaluated to determine ideal locations for station placement. Ideally, the bottle filling stations would replace standard water fountains where a known plumbing source exists. • The equipment and installation costs can be fairly expensive so the number and locations of facilities adding stations may need to be limited.
Benefits/Impacts	<ul style="list-style-type: none"> • Bottle filling stations encourage staff and students to use reusable bottles or bring their own. • Bottle filling stations would reduce the number of single-use plastic water bottles found in the waste stream and ultimately landfilled. • Recycled single-use plastic water bottles are not a highly valued commodity, so reducing their use altogether will help with allowing the recycling stream to consist of more highly valued items.

Option: Install Additional Bottle Filling Stations	
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term • It will take some time to properly identify which locations should receive stations and if their electrical/plumbing configurations will allow for installation. Locations could be chosen every year for installation, pending available funding and budgeting.
Interaction with Other System Components	<ul style="list-style-type: none"> • This option would complement the option of implementing reusable food serviceware and dishwashers as well as ideally impact the results of future waste audits. • Bottle filling stations would directly complement a ban of single-use plastic.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • No jobs are anticipated to be lost or created; it is assumed current custodial staff would maintain the bottle filling stations.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • Bottle filling stations would ideally reduce the number of single-use plastic bottles landfilled.
Potential Cost Implications	<ul style="list-style-type: none"> • The most popular Bottle Filling Stations cost \$1,000 to \$1,500 per unit. • Installation costs are approximately \$500 to \$1,500 per unit, with the lower end of the range having convenient access to electricity and plumbing. Installation typically takes anywhere from 1 to 5 hours per bottle filling stations. • Filters will typically need replacement after 6 months to 1 year. A single filter retails for about \$50. Assuming the filter would be changed twice per year, filters would be about \$100 per unit per year. • On a per unit basis, the capital cost for a new bottle filling station would be about \$3,000 (taking into consideration equipment and installation costs) and the annual maintenance cost would be about \$100 for each unit.^{22,23} • Assuming 50 percent of all County facilities (including park facilities) and public schools, which would be about 150 County facility locations and 100 FCPS locations, would each receive three new bottle filling stations, the total capital cost (with installation) for the maximum scenario would be about \$2.3 million and the total annual O&M cost would be approximately \$75,000.
General Implementation Requirements	<ul style="list-style-type: none"> • Identify locations that could use bottle filling stations as well as how many stations could be installed given budgetary limitations. • Evaluate buildings for installation ease and feasibility. • Hire plumbers for installation. • Designate personnel to maintain the stations and replace filters. This would likely be custodial staff.
General Implementation Requirements	<ul style="list-style-type: none"> • An inventory will need to be taken around each school and facility to confirm if a bottle filling station is needed.

²² [Water Bottle Filling Station Initiative at WoHi.pdf \(worthington.k12.oh.us\)](https://www.worthington.k12.oh.us/water-bottle-filling-station-initiative)

²³ [Grants for Water Bottle Filling Stations in Schools: The Ultimate Guide \(becausewater.com\)](https://www.becausewater.com/grants-for-water-bottle-filling-stations-in-schools-the-ultimate-guide)

2.4 Theme #4: Policy Implementation/Board Directives

The following options involve creating and implementing policies or FCBOS issued directives to promote Zero Waste options through and upstream approach.

2.4.1 Establish a Zero Waste Policy

An overarching Zero Waste Policy that encompasses Zero Waste program options, procurement, recycling, composting, etc. could be established. For example, the Policy could help create standard Zero Waste contract language embedded in all County solicitations to signify the importance of Zero Waste to prospective vendors. A Zero Waste purchasing guide could also be created for County and school operational staff. Current online catalogs available to staff could be updated to prioritize or limit product selections to those that are made from a minimum amount of recycled content (e.g., trash bags, trash carts, plastic containers). Zero waste contract specifications/requirement for custodial staff and high-impact contracts (e.g., cafeteria operations, vending) could be implemented as part of this policy. Each department could take a Zero Waste pledge, as facilitated by the designated Zero Waste Advocate/Site Champion, stating that their facility will purchase goods/services in alignment with the goals of the Zero Waste Policy. Similarly, specific, high-impact facilities could pursue Zero Waste Certification as part of this policy. Each policy category could have its own sub-regulation/policy created or updated as needed.

Table 2-20. Establish a Zero Waste Policy

Option: Establish a Zero Waste Policy	
Description of Option	<ul style="list-style-type: none"> Establish an overarching Zero Waste Policy encompassing a myriad of Zero Waste initiatives/programs/goals for Fairfax County departments and schools to follow. Sub-regulations/policies under the Zero Waste Policy umbrella could be created or updated as needed. Examples may include requiring departments and schools to report diversion rates as a tracking method to gauge the progress of the programs and requiring facilities to have accessibility to available avenues for waste, recycling, and composting.
Actions/Potential Challenges	<ul style="list-style-type: none"> Identifying key items/initiatives to address in the Zero Waste Policy initially. Allocating staff time to generate this policy. Policy would likely need approval from FCBOS for enactment.
Benefits/Impacts	<ul style="list-style-type: none"> Creates a centralized and independent policy of Zero Waste initiatives for the County to follow and reference.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> All regulated Zero Waste options/initiatives could fall under this policy.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Possibly hire one additional staff member to write policy language and oversee future enactment.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Would help enforce Zero Waste initiatives and landfill diversion programs.

Option: Establish a Zero Waste Policy	
Potential Cost Implications	<ul style="list-style-type: none"> • Possibly 1 FTE job to establish policy and provide program oversight (\$120,000 per year). • Outreach and educational briefings would cost approximately \$25,000 as an initial capital cost.
General Implementation Requirements	<ul style="list-style-type: none"> • Policy would need to grow as Zero Waste initiative/program options become established and ready for implementation. • Would likely need FCBOS approval and support. • Could potentially lobby for state/federal policies supporting Zero Waste goals.

2.4.2 Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals

This option includes establishing funding, both through internal and external means, to help fund chosen Zero Waste programs.

In 2005, the County’s Environmental Coordinating Committee (ECC) developed the Environmental Improvement Program (EIP) in response to direction by the FCBOS following the adoption of its Environmental Vision in June 2004. The EIP undergoes a formal project selection and prioritization process of submitted project proposals. County departments have the opportunity each fiscal year to submit proposed projects for review, scoring and consideration. After the set submission period, a staff committee conducts agency interviews for each project, and then evaluates and prioritizes all considered proposals. A final matrix of prioritized projects is then submitted to the Department of Management and Budget and the Chief Financial Officer/Deputy County Executive for consideration in the County Executive’s advertised budget. Approximately \$916,615 is allotted for EIP projects per FCBOS’s current adopted budget.²⁴ Approximately \$10,000 of this total is currently allocated to the Green Purchasing Program. The Green Purchasing Program supports assisting staff in specifying environmental attributes, including recycling, during the County’s procurement process to help contribute to the purchase of green products through the County’s 2,400 contracts, creating fiscal and environmental savings. It is proposed that \$100,000 of the annual EIP funding be repurposed to support Zero Waste options chosen based on this report.²⁵

As a case study example, the Tennessee Department of Environment and Conservation offers a grant portfolio with an 18-month window designed to promote materials management throughout its waste management system. One of the grants applicable to supporting programs and policies is a waste reduction grant which is used to fund equipment designed to establish new collection or processing capacity, improve existing collection or processing operations, or prepare materials for transport and marketing. The Fiscal Year 2018-2019 budget for waste reduction grants was \$3,000,000. The available funding per applicant is capped at \$500,000 and a local match of 50% is required based upon certain economic criteria. Other available grants are for education and outreach efforts and to provide new or expanded organics management services. Two potential grants are to fund recycling and/or composting bins, and to promote the establishment of reuse programs (e.g. fix-it clinics) through

²⁴ [FY 2021 Adopted Budget Summary - Fairfax County, Virginia](#)

²⁵ [FY 2020 Sustainability Initiatives \(fairfaxcounty.gov\)](#)

hosted workshops on waste reduction and reuse, established waste reuse innovation competitions, and conducted tours of entities with exemplary waste reduction and reuse programs. The reuse grants would be expected to range from \$100,000 to \$500,000 per year based on potential diversion impacts.²⁶

Other ways to achieve funding is through outside entities, such as government-based grants, corporate sponsorships, and/or private funding. For example, the EPA has a database of available grants for many facets of solid waste management. There are currently grants for single-use plastics recycling (valued between \$1.5 million and \$2.5 million) and sustainable materials management (valued at \$85,000).²⁷ As another example, the Closed Loop Fund (CLF), a New York-based social investment group that raises funds for investment in sustainable consumer goods, advanced recycling technologies and the development of the circular economy,²⁸ funds replicable, scalable, and financially sustainable recycling infrastructure and innovation projects that involve collection, sortation, processing or reclamation, and end product manufacturing. CLF provides zero interest loans to municipalities. CLF’s typical loan size is \$3 million to \$5 million with 3- to 10-year terms where each loan is secured by collateral.²⁹ As an additional example, in 2016, the Dr. Pepper Snapple Group and Keep America Beautiful grant program provided funding for 900 recycling bins in parks across the country.³⁰ The non-profit sustainability group Annapolis Green donated 22 recycling bins to be placed in public parks around the City funded through a grant from the Dr. Pepper Snapple Group and Keep America Beautiful worth \$11,000. Similarly, grant funding from Keep America Beautiful and its supporting companies (e.g., Nestle Waters, UPS Foundation, Waste Management, the City, South Carolina Ports Authority) has allowed the installation of recycling and trash bins in 20 of the City of Charleston, South Carolina’s parks over the course of 9 years.³¹

Table 2-21. Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals

Option: Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	
Description of Option	<ul style="list-style-type: none"> Establish funding, through internal reallocation of funds and/or external receipt of grants, to help fund Zero Waste programs. Initial costs should include six new full-time positions and further resources needed in the long term.
Actions/Potential Challenges	<ul style="list-style-type: none"> Adjusting current internal funding to allocate money towards Zero Waste initiatives/programs. Requires extensive research and applications of available grants. Requires dedicated individuals to actively apply for available grants.

²⁶ [SWMP Complete.pdf \(nashville.gov\)](#)

²⁷ [Search Grants | GRANTS.GOV](#)

²⁸ [Closed Loop Fund - OECD Ocean](#)

²⁹ [Apply for Funding - Closed Loop Fund - Closed Loop Partners](#)

³⁰ [Group donates 22 recycling bins for use in Annapolis parks - Capital Gazette](#)

³¹ [Introduction \(charleston-sc.gov\)](#)

Option: Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	
Benefits/Impacts	<ul style="list-style-type: none"> Grants would help fund Zero Waste programs which could increase diversion rates and decrease contamination rates. Not very costly if built into current employee salaried time and work responsibilities.
Short-term or Long-term Option	<ul style="list-style-type: none"> Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> Grants would directly aid in the implementation of the Zero Waste options.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Likely would not create new jobs as responsibilities could fall under existing staff designated as Zero Waste Advocates/Site Champions or representatives of Fairfax County's SWMP or DPMM. Could possibly hire an additional staff member to obtain and oversee grant funding programs.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Increase materials diversion rates.
Potential Cost Implications	<ul style="list-style-type: none"> 1 FTE may be needed to oversee the grant funding programs (\$120,000 per year).
General Implementation Requirements	<ul style="list-style-type: none"> The County would need to undertake research on the type of grants that could be applicable. Evaluation and award of internal grant applications for Zero Waste programs would be required (already occurs as part of current EIP).

2.4.3 Establish Board Directive/Policy for Organics or a Food Disposal Ban

Implementing directives by FCBOS to ban organics and food waste from entering landfills can potentially reduce greenhouse gas emissions and reduce the quantity of waste. Multiple states and municipalities have recently adopted organics' bans to mandate the separation of organics to reduce the waste stream of compostable material.³²

Table 2-22. Establish Board Directive/Policy for Organics or a Food Disposal Ban

Option: Establish Board Directive/Policy for Organics or a Food Disposal Ban	
Description of Option	<ul style="list-style-type: none"> Establish directives/policies that divert organics and food waste away from incinerators/landfills into composting facilities. At a minimum set certain limits for disposal of organics as trash. Make food waste diversion accessible throughout County departments and schools.
Actions/Potential Challenges	<ul style="list-style-type: none"> Enforcing separation of organics at the source while minimizing contamination.
Benefits/Impacts	<ul style="list-style-type: none"> Reduction in hauling and tipping costs for waste. Reductions in greenhouse gases.

³² <https://www.biocycle.net/organic-waste-bans-recycling-laws-tackle-food-waste/>

Option: Establish Board Directive/Policy for Organics or a Food Disposal Ban	
Short-term or Long-term Option	<ul style="list-style-type: none"> • Long-term
Interaction with Other System Components	<ul style="list-style-type: none"> • Organics diversion can be taught in coordination with educational outreach programs to teach what can/cannot be composted. • The Green Team and Zero Waste Advocates/Site Champions can help enforce separation of organics without contamination. • Organics separation would require additional equipment, such as new organics bins.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> • Although this may require additional contracts with different haulers, this program is unlikely to result in creation or loss of jobs internally within County departments.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> • From the visual waste audit performed by HDR, by volume, an average of 25% of waste was “Other Compostables” and 5% was “Recoverable Food” which would reduce the waste stream 30% by volume.
Potential Cost Implications	<ul style="list-style-type: none"> • P&E such as flyers, web support, and other outreach materials could cost approximately \$25,000. • Costs associated with an organics collection program (Refer to Section 2.3.1).
General Implementation Requirements	<ul style="list-style-type: none"> • Advertise throughout schools and facilities to emphasize the importance of separating organics. • It would be necessary to ensure there is enough capacity for increased incoming organics tonnage at the processor location, either at the currently used composting facility, any additional facilities, or the I-95 Landfill Complex and I-66 Transfer Station sites that currently accept food waste drop-off from County residents.

2.4.4 Establish Board Directive/Policy to Ban Single-use Plastics

Virginia’s 2020 House Bill 533 banned expanded polystyrene food service containers. This bill requires certain restaurants to stop using such containers by July 1, 2023 and all food vendors by July 1, 2025. In addition, Roanoke, Virginia became the first local government in the state to implement a plastic bag ordinance. Other states such as New York, have also placed bans on plastic bags and plastic straws.

In March of 2021, the Governor of Virginia released a statement about the new Executive Order 77 which would phase out and ban single-use plastics. After 120 days from the executive order taking effect, state institutions of higher education are required to discontinue the buying/distribution of disposable plastic bags, single-use plastic and polystyrene food service containers, plastic straws and cutlery, and single-use plastic water bottles. Exemptions were included for medical/public health and safety uses; however, state agencies are required to create a plan to phase out non-medical single-use plastic by 2025. The intent of the executive order is to address the fact that most plastics are not compostable and that less than 9 percent of plastics are recycled properly in the United States.³³

³³ [Virginia Governor Ralph Northam - March](#)

Fairfax County can establish a board directive to ban single-use plastics in schools and government offices.

Table 2-23. Establish Board Directive/Policy to Ban Single-use Plastics

Option: Establish Board Directive/Policy to Ban Single-use Plastics	
Description of Option	<ul style="list-style-type: none"> Establish FCBOS Directive/Policy to enact a ban on single-use plastics in school and government facilities.
Actions/Potential Challenges	<ul style="list-style-type: none"> Many people find single-use plastics convenient, and this option would involve changing behavior. A ban on plastic bags would reduce the problems caused by plastic bags being placed in recycling bins. Plastic bags can jam the recycling machines resulting in increased costs of processing recyclables due to downtime of machines and/or repair.
Benefits/Impacts	<ul style="list-style-type: none"> Removing single-use plastics from the waste stream would have a direct positive impact on the amount of waste generated. Removing plastic bags from the waste stream would decrease contamination in the recycling stream.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> Progress can be tracked through waste audits and diversion reporting. Materials such as plastics bags could be collected and delivered to appropriate recycling centers by Green Teams or designated Zero Waste Advocate/Site Champion. Removing single-use service ware from cafeterias in schools and government office buildings.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Limited potential for job creation.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Decrease in the amount of single-use plastics in the waste stream.
Potential Cost Implications	<ul style="list-style-type: none"> Education and outreach would be necessary to ensure single-use plastics are not used as well as describing the benefits of this option. This could be estimated as an annual cost of \$25,000. Costs associated with reusable service ware and dishwashers (refer to Section 2.3.3).
General Implementation Requirements	<ul style="list-style-type: none"> Additional education for staff/employees and students will be required.

2.4.5 Support Legislative Actions at The State and Federal Levels

Per Fairfax County’s Code of Ordinances (Chapter 109.1-Article 2), non-residential County-owned entities (e.g., maintenance facilities) are only required to recycle cardboard and mixed paper. This ordinance could be expanded to include all recyclable materials, including plastic bottles and cans through a Board-issued directive. This directive would likely be an easier short-term option to implement for waste and recycling as most, if not all, County facilities and schools already have access

to both types of collection. It would expect to take longer for a composting directive to be implemented as a standardized composting/organics collection system does not currently exist on a County-wide level. The existing Compost Pilot Program could be expanded to make a standardized collection system. Requiring accessibility to waste and recycling, and potentially composting, avenues through a Board-issued directive would set the standard for environmental stewardship and responsible materials management practices across Fairfax County entities.

Table 2-24. Support Legislative Actions at The State and Federal Levels

Option: Support Legislative Actions at The State and Federal Levels	
Description of Option	<ul style="list-style-type: none"> Support legislation or amendment of existing legislation such as Extended Producer Responsibility (EPR) and material bans to promote and facilitate the County's Zero Waste goals.
Actions/Potential Challenges	<ul style="list-style-type: none"> Identifying the resources (e.g., recycling bins) needed for each facility and school. This could potentially be through a survey conducted by designated Zero Waste Advocates/Site Champions. Establishment of organics collection and composting program prior to requiring accessibility through a Board-directive. Enforcing this directive and generating enough funding to make EPR or material bans mandatory to County entities.
Benefits/Impacts	<ul style="list-style-type: none"> This would directly require entities to actively participate in materials diversion, reducing the amounts landfilled. Saves landfill space. Promotes environmental stewardship.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term for waste and recycling: Most County facilities and schools already have waste and recycling collection. The biggest challenge will be to require County facilities to actively participate in recycling of other materials in addition to paper/cardboard. Long-term for composting: Organics/composting collection program would first need to be established.
Interaction with Other System Components	<ul style="list-style-type: none"> Designate Zero Waste Advocate/Site Champions for enforcement. Expand or Implement a Compost/Organics Collection Program. Standardize Receptacles (Recycling).
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Internal job creation or job loss is not anticipated for directive establishment itself.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> This effort would likely increase recycling rates and could potentially increase organics diversion rates from landfilling.
Potential Cost Implications	<ul style="list-style-type: none"> No costs anticipated for generating the Board-directive itself. Costs associated with bin, signage, composting collection program implementation, and enforcement through designated Zero Waste Advocates/Champions could be approximately \$25,000 to \$50,000.
General Implementation Requirements	<ul style="list-style-type: none"> The FCBOS would need to approve this accessibility requirement and an entity (possibly the SWMP or DPMM) would need to enforce it. Establish a standard compost/organics collection program before a Board-directive could be issued.



2.4.6 Use Events as a Catalyst to Minimize or Eliminate Waste

The goal of this initiative is to promote sustainability outside of the office or classroom, and call attention to the waste generated at events. Philadelphia, PA has initiated a goal to be “Home of Zero Waste” events by requiring ample recycling bins at events and staff to monitor and advocate for Zero Waste³⁴. This initiative is also to create more green events based on sustainability, similar to the Green Springs Garden events that are currently in place. This creates more opportunities for people to learn about the community and how they can participate in Zero Waste.

Table 2-25. Use Events as a Catalyst to Minimize or Eliminate Waste

Option: Use Events as a Catalyst to Minimize or Eliminate Waste	
Description of Option	<ul style="list-style-type: none"> Expand the Zero Waste infrastructure (e.g., provide reuse opportunities, more recycling bins, and organics collection) at mass gatherings and events. Examples include adding Zero Waste requirements to county facility or park rentals, providing guides or easier access to infrastructure for event planners, or conducting outreach at existing events to demonstrate Zero Waste in action.
Actions/Potential Challenges	<ul style="list-style-type: none"> Advertising events to the public and determining which events would be most successful. Education and oversight of correct materials placement to keep contamination rates low. Cost to purchase reusable or compostable service ware in lieu of single-use plastic. Compostable service ware is only beneficial if a compost program that accepts compostable service ware is in place. Contractual obligations to ensure events are “green”.
Benefits/Impacts	<ul style="list-style-type: none"> Events would connect with more people outside of County facilities and schools which would increase the outreach efforts. Recycling and separation would eventually be seen as the norm, to help achieve the County’s Zero Waste goal.
Short-term or Long-term Option	<ul style="list-style-type: none"> Short-term
Interaction with Other System Components	<ul style="list-style-type: none"> Requiring events to be “green” would work closely with the single-use plastic ban at events that involve food. Compostable or reusable silverware and dishware would be mandatory.
Potential for Job Loss/Creation	<ul style="list-style-type: none"> Would likely not create jobs nor cause job loss. Will be a volunteer effort through existing staff/employees.
Potential Effect on Waste Reduction	<ul style="list-style-type: none"> Enforcing correct materials placement at large events by having waste moderators would significantly improve the diversion of recyclable and organic materials out of the waste stream.

³⁴ [City of Philadelphia Zero Waste Initiatives](#)

Option: Use Events as a Catalyst to Minimize or Eliminate Waste	
Potential Cost Implications	<ul style="list-style-type: none"> • Reusable or compostable material for public events will generally cost more. <ul style="list-style-type: none"> ○ 1,000 single-use plastic forks cost around \$20 ○ 1,000 compostable forks cost around \$85 ○ 1,000 reusable forks cost around \$1,500 <ul style="list-style-type: none"> ▪ Reusable serviceware will most likely save money in the long run. • P&E such as flyers, web support, and other outreach materials could equate to about \$25,000.
General Implementation Requirements	<ul style="list-style-type: none"> • Enforcing green events would require the County to create volunteer opportunities among existing staff/employees. Could also potentially hire a private company to provide outreach and compliance at events. • Could implement a penalty fee or require a security deposit from event hosts if events do not follow the County’s “green” policy.

3 Tiered Matrix for Implementation

Each of the 24 evaluated Zero Waste options were categorized into a tiered matrix based on the following criteria:

- Implementation Timeframe:
 - Short-Term (ST) – Years 2021 to 2024
 - Long-Term (LT) – Years 2024 to 2030

- Cost:
 - High (\geq \$1.0 million)
 - Medium ($\$100,000 < X < \1.0 million)
 - Low (\leq \$100,000)

The matrix suites of tiered options for implementation are either “Gold”-level (top tier), “Silver”-level (middle-tier), or “bronze”-level (bottom tier). The tiered matrix is shown in **Table 3-1**.

Table 3-1. Tiered Matrix of Evaluated 24 Zero Waste Options

GOLD			
Theme	Option	Implementation Timeframe	Cost
#1: Culture: Education and Outreach	Designate a Zero Waste Champions	ST	L
#3: Facility Upgrades	Standardize and Increase Waste Receptacles and Signage	ST	M
#1: Culture: Education and Outreach	Facilitate Action through Campaigns, Toolkits, and Guides	ST	M
#2: Program Establishment	Establish Commitments by all County Departments and Schools to Participate in Zero Waste	ST	L
#4: Policy Implementation/Board Directives	Establish a Zero Waste Policy	ST	M
#2: Program Establishment	Establish Programmatic Reporting of Activities by County Departments and Schools	ST	L
#4: Policy Implementation/Board Directives	Establish Funding and Allocate Resources Appropriate to Meet Zero Waste Goals	LT	H
#3: Facility Upgrades	Implement Reusable Food Service Ware	LT	H
#3: Facility Upgrades	Install Additional Air Hand Dryers	LT	H
#3: Facility Upgrades	Design and Retrofit for Zero Waste	LT	H
#2: Program Establishment	Measure Success: Waste Audits, Reporting and Facility Assessments	LT	M
SILVER			
Theme	Option	Implementation Timeframe	Cost
#2: Program Establishment	Establish Zero Waste Team	ST	H
#4: Policy Implementation/Board Directives	Establish Board Directive/Policy to Ban Single-use Plastics	ST	L
#2: Program Establishment	Launch a Reusable Packaging Program	ST	L
#1: Culture: Education and Outreach	Develop Strategies to Recognize Motivate, and Compensate Staff	ST	M
#1: Culture: Education and Outreach	Develop Educational Resources, Signage, and Training	LT	H
#2: Program Establishment	Establish or Expand Alternate Recycling, Reuse, and Recovery Program Partnerships	LT	M



#2: Program Establishment	Expand Sustainable Purchasing Program	LT	M
#4: Policy Implementation/Board Directives	Establish Board Directive/ Policy for Organics or a Food Disposal Ban	LT	L
#4: Policy Implementation/Board Directives	Support Legislative Actions at The State and Federal Levels	LT	L
BRONZE			
Theme	Option	Implementation Timeframe	Cost
#1: Culture: Education and Outreach	Maximize Opportunities for Student Engagement	LT	L
#4: Policy Implementation/Board Directives	Use Events as a Catalyst to Minimize or Eliminate Waste	LT	L
#2: Program Establishment	Establish or Expand Edible Food Rescue and Donation Program	LT	L
#3: Facility Upgrades	Install Additional Bottle Filling Stations	LT	H

4 Prioritization of Initial 50 Zero Waste Options

A total of 50 Zero Waste options for potential implementation were initially identified. Each option was categorized into one of the following five themes: Theme #1 – Educational and Outreach Campaigns; Theme #2 – Changing Culture; Theme #3 – Program Establishment; Theme #4 – Equipment Changes; and Theme #5 – Policy Implementation/Board Directive. Please refer to Table 4-1 for these categorized themes and options. The options in each theme are ranked in descending order from highest priority to least priority and identified as having either short-term or long-term estimated implementation timeframes.

Table 4-1: Identified 50 Zero Waste Strategies for Potential Implementation

#	Option	Short-Term or Long-Term (ST or LT)
Theme #1: Culture, Education, and Outreach		
1.	Designate Zero Waste Advocates/Site Champions	ST
2.	Implement Educational Workshops/Trainings	ST
3.	Establish Green Teams	ST
4.	Educate on Loose Recyclables Placement	ST
5.	Host Zero Waste Outreach Events	ST
6.	Have Recognition Awards	LT
7.	Partner with Other Sustainable Initiatives	LT
8.	Partner with Neighboring Jurisdictions on Implementing Zero Waste Strategies	LT
9.	Create Student Internships or Service-Learning Opportunities	LT
10.	Designate Volunteer Waste Separators at Community Events	ST
Theme #2: Program Establishment		
1.	Implement or Enforce Purchasing Policy/Green Procurement	LT
2.	Require Events to be “Green”	ST
3.	Address Packaging in the Supply Chain	LT
4.	Systematically Reduce Junk Mail	LT
5.	Remove or Mitigate Use of Paper Manipulatives	ST
6.	Promote/Require Bulk Product Purchasing and Container Reuse	ST
7.	Encourage Employees/Students/Visitors to Pack Zero Waste Lunches	ST
8.	Expand or Implement Compost Bin Program/Organics Collection Program	LT
9.	Establish Edible Food Rescue and Donation Program	ST
10.	Conduct Waste Audits	
11.	Establish or Expand Alternate Recycling/Reuse/Recovery Program Partnerships	LT
12.	Create Systemwide Backhauling Program	LT
13.	Systemwide Plastic Film Collection/Recycling Program	LT
14.	Establish Fix-It/Repair Clinics	LT
15.	Establish Sharing Libraries	LT
16.	Establish Anti-Litter Programs	LT

#	Option	Short-Term or Long-Term (ST or LT)
Theme #3: Facility Upgrades		
1.	Standardize Receptacles	ST
2.	Install Additional Bottle Filling Stations	LT
3.	Implement Reusable Food Serviceware and Dishwashers	LT
4.	Install Additional Air Hand Dryers	LT
5.	Mitigate Illegal Dumping through Enclosures/Surveillance	LT
6.	Remove Vending Machines or Only Provide Food/Beverages with Reusable or Recyclable Packaging	ST
7.	Reduce Staff Bin Size for Waste Awareness	ST
8.	Add Washer/Dryers for Linens	LT
9.	Replace Exterior Recycling Dumpsters to Ones Without Cardboard Slots	ST
Theme #4: Policy Implementation/Board Directive		
1.	Require Quarterly or Annual Diversion Reporting	LT
2.	Establish Board Directive for Waste, Recycling, and Potentially Compost Accessibility	ST
3.	Establish Board Directive to Ban Single-use Plastics	ST
4.	Establish Board Directive for Organics/Food Disposal Ban	LT
5.	Establish Funding	ST
6.	Establish a Zero Waste Policy	LT
7.	Establish a Department Zero Waste Pledge	ST
8.	Pursue Zero Waste Certification for High-Impact Facilities	LT
9.	Policy Directive to Require Minimum Recycled Content Standard in Certain Products	LT
10.	Establish New or Amend Existing Recycling Directives/Policies	LT
11.	Use Haul Frequency Waiver to Incentivize Building Manager to Develop an Organics Program	LT
12.	Lobby for State/Federal Policies Supporting Waste Reduction Goals	LT
13.	Establish “Pack It In, Pack It Out” or “Leave No Trace” Policy for Parks and Other Outdoor Events on Public Grounds	ST
14.	Establish Easy Reporting for Overflowing Trash Bins	ST
15.	Create a Pledge System for Departments to Participate in Battery/Bulb/Other Hazardous Waste Recycling Programs	ST

5 Conclusion

The four themes outline various program options that can help Fairfax County advance its Zero Waste objectives and achieve its goal of 90% landfill diversion by 2030. With assistance from Fairfax County departments and schools, over time, chosen programs can become more developed and implemented for success. The tiered matrix provides a summarized perspective of the evaluated 24 Zero Waste options.

All four themes fall under the umbrella of one central theme: to bring about change throughout Fairfax County. Education and outreach campaigns are necessary to teach students and staff at County facilities and FCPS schools on sustainability and how their actions can impact waste generation. Understanding the change learned through education and outreach programs will eventually change the culture of how people handle waste, garnering more interest in sustainability. Programs are established to help make sustainable changes, monitor waste streams, reuse more material, and allow more opportunities for recycling. As the mindset around sustainability, recycling, and waste diversion changes, programs see a higher success rate through increased participation and feedback to help improve the current programs in place. The surrounding infrastructure, including necessary equipment, supports and enables a greener, more sustainable culture by providing the opportunity for people to make the “green choice”. The final theme of policy implementation connects to all other themes by setting new policies/directives that facilities and schools would need to follow as well as creating a budget to support the changes in the current conditions. Achieving Zero Waste requires economic, social and environmental changes that are possible and can be achieved.

The Zero Waste Plan includes a more in-depth detail of the strategy and process to achieve active stakeholder involvement in the chosen Zero Waste options.



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