



If you're not for Zero Waste, how much waste are you for?

Transitioning from Waste Incineration Towards Zero Waste in Montgomery County, Maryland

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Purpose

The Sugarloaf Citizen's Association (SCA) engaged the Institute of Local Self-Reliance (ILSR) to determine how economically feasible it is for Montgomery County to transition to a Zero Waste system as the county considers ending the use of the Montgomery County Resource Recovery Facility (MCRRF) municipal solid waste incinerator by April 1, 2021 when the contract with the facility expires.

This trash incinerator is the second largest air polluter in Montgomery County. It is annually blanketing the County with approximately 740 tons of health-damaging air pollutants plus over 500,000 tons of CO₂e (greenhouse gases), while sending 180,000 tons of toxic ash to Virginia landfills. These emissions are many times higher than what a coal-burning power plant of the same size would generate. They include substances for which there are no safe doses, such as dioxins, furans, mercury, lead, and particulate matter.

The bonds for the incinerator had cost the County \$19 million annually since 1996. They were paid off in 2016, and the County now has a huge sum of tax dollars freed up, a fraction of which could easily fund the start-up costs of implementing a Zero Waste Plan, leading the County to an overall reduction in waste disposal costs.

Further, the positions of Director of the Department of Environmental Protection (DEP and Section Chief for Northern Operations, Emissions and Strategic Planning are open. These positions could now be filled with administrators with comprehensive recycling, composting and Zero Waste management experience. The Chief of Division of the Solid Waste was also open but has just been filled internally.

Finally, the Northeast Maryland Waste Disposal Authority (NMWDA) has issued a Request for Proposals (RFP) on behalf of Montgomery County's DEP asking many of the same questions that SCA is asking: What new initiatives can be introduced to improve the overall materials management system?

As the purpose of the NMWDA is primarily to run the waste incinerator, there is an inherent conflict of interest in having the NMWDA oversee this study. It is recommended that the scope of the RFP and its consultant evaluation criteria be reviewed and approved by the County Council, that the Council approves the consultants selected for the study, and that the Council has final authority over the implementation of recommendations. One of the concerns of the current wording of the RFP is that there is no mention of a Zero Waste management plan that would examine the feasibility of closing the incinerator. In fact, the study is designed to look at the very unrealistic continued use of the incinerator through "2040 and beyond," as well as exploring other new incineration schemes.

Methodology

ILSR reviewed county documents, interviewed officials from the County DEP, and spoke with County Council staff, and citizens of Montgomery County including members of the SCA board of directors. In addition, national Zero Waste experts and managers of Zero Waste programs throughout the country were consulted. A thorough review of proven, existing programs around the country has been done to select a strategy tailored to the specific needs of Montgomery County.

ILSR is not satisfied that all pertinent data has been explored. Information is either currently not available or the DEP chose not to share it with ILSR. ILSR was told by the Acting Director of the Division of Solid Waste to use Public Information Act (PIA) requests.

As a result, this Memorandum should be seen as a preliminary assessment pending detailed data assessment and further analysis. The Memorandum presents a pathway for eliminating incineration and for reaching the highest levels of materials diversion from landfills.

Summary of Findings

Montgomery County can build upon its current recycling and composting programs to realize a residential and commercial materials management system without incineration and the resulting pollution.

Outlined below is a two-phased strategy based on best practices successfully operating throughout the U.S. to eliminate the incinerator and move toward Zero Waste.

Phase 1 would allow the County to reach between 69% and 81% diversion of useable materials. This could take between 4 to 6 years from the time the decision is made to move in the direction of materials management that many citizens have wanted since the incinerator was proposed in the early 1990s. Residual trash can be diverted to one of several well-managed private landfills in rural Virginia, available by rail that use gas capture technology assuring that greenhouse gas (GHG) emissions and other environmental impacts are far lower than those currently experienced through the use of the incinerator in Dickerson.

Phase 2, reaching Zero Waste, or 90% or more diversion of discarded materials going to landfill, could be accomplished within 4 years after Phase 1 is reached. A 90% reduction would match or improve on the volume reduction accomplished when the incinerator reduces trash to ash. It would do this without putting 90% of the trash volume into the air as air pollution.

Thus within 10 years, or by 2029, Montgomery County can have a Zero Waste infrastructure that will serve the County for generations to come. These high levels of recycling could not be attained if the County continues to use the incinerator. Incineration of waste and achieving the

highest level of recycling are incompatible as paper and plastic are a primary source of BTUs in the waste stream.¹

Phase 1 can be accomplished by recovering hundreds of thousands of tons of materials currently being incinerated in addition to the materials already being recycled; allowing the County to reach over 70% recycling.

Phase 2 can be accomplished by applying additional strategies to augment strategies implemented under Phase 1; allowing the County to reach 90% or more diversion through source reduction, reuse, recycling, and composting, as well as legislation mandating the procurement and use of greener materials and requiring manufacturers to take responsibility for the redesign of their products.

If Montgomery County is not able to fully implement Phase 1 by 2021, it is still recommended not to renew the incinerator contract and to switch from rail hauling incinerator ash to Virginia landfills to rail hauling residual trash instead. The environmental impacts (including GHG emissions) from a properly managed landfill are far less damaging than those of the incinerator in Dickerson. The Maplewood landfill in Virginia is available by rail from Montgomery County through the same rail carrier (CSX), has 150 years of available space (more than any in the state), and is in a rural setting with very few residents in the area. Its gas capture conforms to all guidelines set by state and federal regulations.

As the strategies recommended in this paper are implemented and refined, the need for landfill should diminish to fewer than 70,000 tons.

For each recommendation under Phases 1 and 2, the Memorandum estimates the cost of implementation and technical advisers from the private and public sector who can assist the County in reaching its goals.

Current Materials Management System

The Covanta-run incinerator is the primary solid waste management tool of the County. Yet, Montgomery County has substantial investments in recycling and composting infrastructure. Recycling has been mandatory for commercial and residential generators since the mid-1990s, yet compliance is considerably below achievable rates. Most household recycling is collected in a dual stream system, while several cities in the County have converted to single stream recycling. Dual stream materials are delivered to the County's Shady Grove Processing and Transfer facility in Derwood, MD. After processing, materials are marketed through the Maryland Environmental Service (MES) through monthly auctions by private industry. MES also

¹ See recent reports from the United Kingdom and Sweden. www.dw.com/en/britains-lust-for-burning-trash-sends-recycling-goals-up-in-smoke/a-40094211; and, www.independent.co.uk/voices/sweden-recycling-rates-revolutionary-dark-truth-behind-uk-wales-incineration-a7471861.html. Sweden's recycling rate of 49.8% has been stagnant since 2006. Wales, UK has achieved 60% recycling levels with no incineration.

processes yard trimmings, which are collected separately and delivered to the composting facility adjacent to the incinerator. MES sells finished compost and mulch under the LeafGro trademark. The County is currently developing a strategic plan mandated by a County Council resolution to compost residential and commercial food scraps.

Discarded materials are tipped at the Shady Grove facility and transferred via rail haul to the incinerator in Dickerson. Ash residue is rail hauled to a landfill in southern Virginia.

The incinerator earns Montgomery County \$5 million annually as a Tier 1 renewable energy credit under the state's Renewable Portfolio Standard (RPS). Maryland is the only state to reward burning garbage at this level. Most recently the Montgomery County Council unanimously passed a resolution calling on the state to rescind this status for garbage incineration; indicating its willingness to forego this annual payment. State legislation has been considered in the past few legislative sessions to remove incineration from the RPS as a clean source of energy, and in April 2018, one such bill was passed by the Senate in a 38-6 vote. Statewide environmental advocates are confident that that this subsidy will be eliminated in the 2019 or 2020 legislative session.

The County currently claims a 60% recycling and composting diversion rate. This figure is an illusion. This rate counts approximately 150,000 tons of ash residues from the incinerator and a 5% source reduction recycling credit allowed by the state. ILSR estimates that the actual recycling rate is 40%² of an estimated annual generation of 1.1 million tons of commercial and residential discarded materials, or 440,000 tons.

The incinerator manages an estimated 700,000 tons per year of discarded municipal solid waste and construction/demolition debris – a rate of approximately 1,900 tons per day, 365 days per year.³ This figure includes both materials incinerated as well as by pass waste that cannot be incinerated. The facility's rated capacity for burning is 1,800 tons per day. These materials include hundreds of thousands of tons of compostables and recyclables. The incineration of these large quantities of recyclable materials continues despite an apparent ban on these materials being sent to the incinerator.⁴ Most of these materials can be diverted from incineration using state of the art practices in operation throughout the U.S. Figure 1 presents figures for 50% and 70% recovery of useful materials currently being incinerated. Based on strategies proven in other municipalities in the U.S. to effectively and efficiently employ Zero Waste methodologies, this Memorandum lays out a roadmap to reach these goals.

² See, Memorandum from Levchenko, Senior Legislative Analyst, 12 January 2015.

³ Conversation with Bill Davidson and Bill Broglie of the Montgomery County DEP, October 2017. From 2014 to 2017 the facility incinerated an average of 1,589 tons per day, according to the U.S. Energy Information Administration (Form 923 database).

⁴ See Division of Solid Waste Services, Montgomery County Ten Year Solid Waste Management Plan, 2012-23.

Potential Recovery of Materials at 50% and 70%

Materials	Tons	50%	70%
Food, soil, wood and plant debris	270,000	135,000	189,000
Paper	154,000	77,000	107,800
Plastics	115,000	57,500	80,500
Textiles	32,000	16,000	22,400
Glass	19,000	9,500	13,300
Metal	19,000	9,500	13,300
Reusable items	32,000	16,000	22,400
Total	641,000	320,500	448,700

If just 50% of the reusable, recyclable and compostable materials currently burned at the incinerator are recovered and added to the 440,000 tons of materials already recovered, total diversion from incineration would be an estimated 760,000, or a 69% diversion rate from the incinerator; leaving 340,000 tons of residuals to be managed. If 70% of materials (448,000 tons) currently incinerated were recovered for a total of 888,000 tons, or an 81% diversion rate from the incinerator, (current 440,000 tons + 448,000 tons), the County would have to manage 212,000 tons of residuals. These residual materials can be delivered to regional landfills using the existing rail haul system.

The implications of these increases in the amount of materials diverted from the incinerator are profound. Air and ash pollution coming from the incinerator would be completely eliminated. Based on data available, cost of a new non-incineration materials management and recycling system would cost slightly less than the cost of maintaining the use of the incinerator. At this time, it is impossible to accurately assess the comparative economic costs of an alternative system due to lack of accurate and current data.

Based on the Annual Average Unit Cost Trends for Montgomery County Solid Waste Management 2002-2013⁵, the per ton cost of incineration was \$73. This cost may be higher as it is unclear if this cost includes the cost of transferring discarded materials from Shady Grove Transfer Station to the incinerator in Dickerson and the cost of ash disposal. The per ton cost of recycling and composting yard debris (\$40 per ton), including processing, education and enforcement (\$17 per ton) is \$57 per ton. This is a net differential of \$16 per ton in favor of recycling and composting.

ILSR estimates that the cost of composting food scraps with yard trimmings, or co-composting, as currently planned by the County DEP, will increase the cost of composting to \$50 per ton based on figures from a similar co-composting system in Prince George's County.⁶ Further,

⁵ <https://www.montgomerycountymd.gov/sws/resources/files/budget/aauc.pdf>

⁶ Correspondence with Denice Curry, Prince George's County, Department of Environmental Protection, February 1, 2018.

additional investment will be needed to upgrade, reconfigure and possibly relocate the Shady Grove Recycling and Transfer Station.⁷ It is also probable that the per ton cost of operating the incinerator has increased since 2013, given that the facility is admittedly aging and experiencing the need for more frequent maintenance. Until a full audit of the current financial data is completed it is impossible to verify any cost comparison.

The following two sections of this Memorandum identify the next steps needed to first, reach the goal of approximately 70% diversion. The second section delineates further action that could bring the County to a 90% diversion rate, eliminating almost entirely the need to landfill.

Phase 1. Recommended Next Steps for Achieving 70%+ Diversion from Landfill, without Incineration

1.1 Audit

County decision-makers should assess options for future materials management policies and programs based on data that is either currently not available or that the DEP chose not to share with ISLR.

Undertake a forensic audit of the current system, breaking down per ton costs of each major component of the system --- incineration, composting, and recycling.

Cost: \$40,000

Time Frame: 1-2 months

1.2 Rail Haul of Residual Materials and Food Scraps

Decision-makers should build on the existing infrastructure that is available.

1. Undertake an analysis to determine the feasibility of rail-served removal of residual materials from collection sites in Montgomery County to landfills. CSX and Norfolk Southern Railroads provide this service on the East Coast and can be approached to finance any required adjustments. Ash is already hauled by CSX to landfills in Virginia, and CSX serves multiple other landfills in the state, including those in less populated areas than the one currently in use. These railroad companies have in the past paid for the adjustments needed to link local rail lines to their rail-served hauling infrastructure.

There are several private landfills accessible by rail in rural Virginia with more than enough space available to easily accommodate Montgomery County's residual trash

⁷ Conversation with Bill Davidson, Montgomery County DEP, November 2017.

after closing the incinerator in 2021. Maplewood Landfill is a good example. It has 150 years of space available and uses best practices for gas capture so would be far less harmful to the environment than continuing to burn the County's trash. Furthermore, it is more economical and is not near a minority community so that the county's choice to use it would not violate the Civil Rights Act.

Cost \$5,000

Time Frame: 1 month

2. Assess the feasibility of rail transporting of organic materials to a static pile composting system at the County's Dickerson Yard Waste Composting Facility as compared to other possible sites for a residential food scraps composting facility. If 100% rail haul is not feasible, localized composting sites throughout the County may be more efficient and economical.

Cost: \$3,000

Time Frame: 1 month

1.3 Shady Grove Processing Facility Upgrade and Center for Hard to Recycle Materials

Update operating equipment needed to manage increased amount of materials processed at the Shady Grove Recycling Facility, and establish a Center for Hard to Recycle Materials (CHARM) drop off center to manage such items as plate glass windows, plastic bags and bubble wrap, foam packaging sheets, #6 white block foam packaging, big durable #2 plastic, small plastic appliances, metal appliances, mattresses and box springs, bicycle parts, cooking oil, yoga mats, porcelain toilets, sinks & urinals, concrete, paper shredding service and shredded paper, fire extinguishers, and textiles.⁸ The Shady Grove facility was state of the art when it was designed two decades ago but equipment is now failing and outdated. Much more efficient and effective technologies are now available for handling and processing recyclable materials.

Montgomery County can take advantage of the information gleaned from responses to the recently issued City of Berkeley, CA RFP for a redesign and upgrade of their 8 acre processing center/transfer station into a Zero Waste facility.⁹

Cost: Design - \$75,000; Capital Costs \$15 million

Time Frame: Design 4 months; Capital Improvements 1.5 years

⁸ See, www.ecocycle.org/charm/.

⁹ For a copy of the RFP see, cityofberkeley.info/uploadedFiles/Finance/Level_3_-_General/FINAL_18-11171-C_-_Solid_Waste_Transfer_Station_Feasibility_Study_FINAL.pdf

1.4 Unit Pricing

Charging households by amount of materials generated provides a direct incentive to recycle and compost.

Materials management services in Montgomery County are paid through property taxes and a service fee surcharge. Some 7,000 jurisdictions in the U.S. have implemented unit pricing for collection and processing services, referred to as Pay As You Throw (PAYT), Save As You Throw (SAYT) or Save Money and Reduce Trash (SMART) systems, which charge households based on the amount of materials generated for curbside collection.¹⁰ Source-separated materials can be collected at no or reduced charges to the household. The incentive to recycle and compost is direct. Studies indicate that unit pricing can double a city's recycling rate within one year of implementation. In addition to stimulating more source separation, an overall reduction in waste generation can be as high as 40%.¹¹

Currently, no jurisdiction in Montgomery County uses unit pricing making it a potentially powerful tool for rapid and significant increases in recycling and composting.

The city of Worcester, MA, population estimated at 200,000, is a useful example for Montgomery County. In 1993, Worcester moved toward recycling and away from incineration by making recycling mandatory and implementing unit pricing. The recycling rate doubled within one year. Since then the city reports savings of \$99 million in avoided disposal costs, making savings a far more important economic and financial asset than the market sale of recyclable materials. Unit pricing can also accelerate food scrap composting by encouraging backyard composting, and community scale composting to reduce discarded materials generated by households.

Unit pricing programs can include waivers or reduced fees for low-income residents made affordable by system savings as indicated.

The states of Connecticut and Rhode Island have contracted with Waste Zero, Inc. to assist jurisdictions interested in planning and implementing unit pricing. Carroll County, MD has also contracted with Waste Zero, Inc. to develop a unit pricing pilot program, which is about to commence.

New unit pricing programs in Sweden, Norway, and France use a one-pass system as well. Household collection of garbage, recyclables, and organics are put in color-coded plastic bags. All bags are put in the collected curbside in one truck. The bags are sorted by color and sent by conveyor to recycling, composting and disposal. Labor, fuel, equipment costs and vehicle emissions are reduced. The per capita generation of discarded materials is also reduced.

¹⁰ See, www.paytnow.org

¹¹ Correspondence with Kristen Brown, Waste Zero, Inc., September 2017.

Research the feasibility of unit pricing for Montgomery County cities and unincorporated areas.

Cost: \$20,000 for plan; \$30,000 for pilot implementation and oversight

Time Frame: Plan 2 months; implementation 12-14 months

1.5 Composting for Residential and Commercial Food Scraps; Wood Recovery from Fallen Trees

The County is exploring the feasibility of a static pile compost system for residential organic materials. Prince George's County recently developed a similar system with the capacity of 85,000 tons annually.¹²

1. Source separation of food scraps and food-soiled papers should be made mandatory for residential and commercial generators.
2. Continue to explore the feasibility of residential food scrap co-composting at Dickerson and alternative sites closer to the source of generation, in consultation with community representatives.

Cost: DEP staff time, citizens' time; Estimated capital costs \$ 5-10 million.

Time Frame: 6 months

3. For commercial organic materials, work with the private sector generators and haulers to create a 'green zone' for companies such as Veterans Compost, Compost Cab, Waste Neutral and Compost Crew already serving commercial accounts in the Montgomery County region.

Cost: DEP staff time, private sector staff time

Time Frame: 1 year

The County should emphasize distributed, or back yard composting and community scale composting as a complement to full scale facility co-composting sites at Dickerson or other locations.¹³ These strategies will reduce the need for collecting compostable materials curbside for a significant number of households. Food scraps and food-soiled papers are estimated at 15% of household discards. Backyard and community scale composting permanently eliminates these materials from the discard stream. Montgomery County currently distributes free compost bins for yard trimmings at special events. Free or subsidized *closed* food scrap compost bins would alleviate homeowners concerns and increase usage.

Several jurisdictions subsidize the purchase of backyard compost bins for households. Washington, DC plans to offer a \$75 rebate on new composting systems and training on how to

¹² Correspondence with Denice Curry, Prince George's Department of the Environment.

¹³ See www.ilsr.org/wp-content/uploads/2014/07/growing-local-fertility.pdf; and, www.ilsr.org/paydirt/.

use them.¹⁴ Through its NYC Compost Project established over 20 years ago, the City has supported the growth of community compost sites through partnerships with cultural institutions and non-profit organizations, outreach, and education; there is now a network of hundreds of community compost sites, 225 of which are affiliated with the NYC Compost Project.¹⁵

1. Establish programs and incentives for back yard and community scale composting to be included in the overall plan for composting in the County.

Cost: DEP staff time; consultant \$10,000

Time Frame: 3 months

The City of Baltimore has established a wood recovery enterprise at Camp Small in northern Baltimore. This facility receives fallen trees, processes them into marketable logs and wood products for local businesses. This is a municipal enterprise, financed by a \$98,000 loan from the city. The investment has already repaid itself after just 2 years of operation.

2. Explore the feasibility of establishing a County wood recovery enterprise

Cost: DEP and Montgomery County Economic Development Corporation staff time

Time Frame: 2 months

The county should also consider stabilizing any remaining organic fraction of the waste stream through anaerobic digestion of mixed waste residues to get even closer to Zero Waste and further reduce greenhouse gas generation after final disposal in landfill. Anaerobic digestion captures methane generated by organic residuals to avoid gas generation and odors at the landfill. It captures the methane in an enclosed environment where capture is more complete. San Francisco, CA has a good example of this technology, and Otter Lake Landfill in Halifax, Nova Scotia, Canada uses an aerobic process to similarly accomplish the needed biological stabilization.

1. Research the applicability of properly scaled anaerobic digestion facility for methane recovery from portions of the organic waste stream.

Cost: DEP staff time; consultant \$15,000

Time Frame: 3 months

1.6 Construction and Demolition Debris (C&D)

Montgomery County recommends that C&D materials be reused, recycled or donated to non-profit organizations such as the Loading Dock in Baltimore. These materials include asphalt

¹⁴ DC Councilmember Cheh introduced a bill to promote backyard composting in 2017.

¹⁵ See www1.nyc.gov/assets/dsny/zerowaste/residents/nyc-compost-project.shtml

shingles, wood and wood pallets, bricks, dry wall, concrete and glass. Cardboard and scrap metal are required to be recycled.

C&D recycling and reuse could be made mandatory as in several cities in the U.S. Cities have imposed special permit requirements for companies applying for demolition permits. Companies must put up a bond prior to demolition. The bond is reimbursed when companies show that they have recycled at least 50% of its C&D debris. One jurisdiction, Monrovia, CA, requires 75% recovery of this material derived from building demolition. Austin, TX just passed regulations that phase in mandatory recycling of construction and demolition debris from households and commercial buildings over a two-year period. Portland, OR requires deconstruction of historic or old buildings slated for demolition. Since implementation of the new ordinance, several new building materials yards and deconstruction operators have begun operations in the city.

Require deconstruction, reuse, recovery and recycling of Construction and Demolition (C&D) debris.

Cost: DEP staff time; County Council staff time; Consultant \$5,000

Time Frame: 2 months

1.7 Repair and Reuse

Reuse and repair generate even higher value and less environmental impact than recycling or composting. Based on data in a 2007 report analyzing the discarded materials from the state of Delaware, reusable products were just 3% of the total to start with, and were *worth* \$550 per ton after repair and resale. In Montgomery County, these reusable products could be valued at \$2.6 million annually.¹⁶ Model reuse enterprises are thriving in the Montgomery County region.

Reuse is the second highest priority in the Montgomery County waste management plan, after waste reduction, yet there appears to be no active program for reuse. This despite ample working models in the Montgomery County region. In Frederick, E-End USA is a successful electronic scrap deconstruction company. Second Chance, Baltimore, deconstructs buildings and resells used building materials in its warehouses located in downtown Baltimore. It has grown in the last 13 years to 165 workers, recruited and trained from the city's unemployed and underemployed residents. Humanim is a robust social enterprise that specializes in deconstruction of public housing facilities and other reuse operations that employ challenged and hard-to-employ residents. The nonprofit organization has recently opened Brick+Board, which specializes in sorting and selling materials recovered from deconstructed buildings. The Loading Dock, a nonprofit reuse store, has been operating since 1980. Community Forklift in Hyattsville, MD operates a 30,000 square foot store for used building materials, household goods and antiques. Habitat for Humanity operates "Restores" in the area which make used

¹⁶ See, ILSR, "Resource Management in the State of Delaware", prepared for the Delaware Department of Natural Resources and Environmental Control, 2007 at www.ilsr.org/resource-management-in-the-state-of-delaware/.

household goods available to low-income households. eWorks is a private company that has partnered with Melwood, a non-profit social enterprise that employs challenged workers, in Upper Marlboro, MD to deconstruct electronic scrap for resale of valuable parts and alloys.

Cities have also provided sales tax exemptions, grants, and other subsidies to the local reuse sector. Companies such as Oakland's Repair Revolution and East Bay Center for Creative Reuse provide education and technical assistance as well as inspiration for new ideas for reuse. Saint Vincent De Paul, Lane County, OR (SVDP) has established several successful reuse enterprises with 700 workers based in Eugene, OR. Under grants from national foundations they have replicated these enterprises on the East Coast starting 10 social enterprises and creating \$10 million in economic activity. SVDP has expressed interest in working with non-profit partners in the region. Montgomery County would be a logical partnership with SVDP.

Local governments also nurture Repair Cafes, Fix It and Repair Stations, where staff and volunteers train residents. The Digital Rights network is pressing for additional assistance from original equipment manufacturers to provide repair kits and tools to people who purchase their products.

Reuse enterprises have a social impact as they provide income for non-profit organizations to carry out their missions. Also, employment in reuse companies has shown to reduce recidivism rates among employees who are returning from incarceration. In Indianapolis, electronic scrap recyclers at RecycleForce have a recidivism rate of 26%, compared to a citywide average of 76%.¹⁷

Explore the feasibility of attracting social enterprises to establish a reuse hub in an existing warehouse or as part of a renovated Shady Grove Facility. Montgomery County has several unused and outdated office parks that might be reused for this purpose.

Cost: DEP staff time, consultant \$3,000

Time frame: 3 months

Phase 2. Recommended Next Steps for Approaching Zero Waste in Montgomery County

To be recognized as a Zero Waste community, Montgomery County would move from 70% to 90% diversion or greater following the internationally peer-reviewed Zero Waste definition and Zero Waste Hierarchy as defined by Zero Waste International Alliance and Zero Waste organizations around the globe. The following next steps can help the County reach this goal.

¹⁷ See www.ilsr.org/waste-360-article/, and, "Recycling E-Waste with Workers Looking for a Second Chance", www.waste360.com/recycling/recycling-e-waste-workers-looking-second-chance

2.1 Additional Incentives

In addition to unit pricing, there are other ways to provide monetary incentives for household recycling. Two private companies, RecycleBank and Rewards for Recycling, provide vouchers redeemable for dollars at local and brand name stores. Cities provide direct incentives through contests that award \$1,000 to households through random inspection of recycling bins. Seattle coordinates a community-level competition with an annual award of \$50,000 to the leading recycling community, to be used for community improvements.

1. Research the feasibility of adding voucher incentives for recycling households.

Cost: DEP staff time

Time Frame: 1 month

2. Research the feasibility of adopting recycling contests as a component of public awareness and education programs. Research the use of contests by other jurisdictions.

Cost: DEP staff time

Time: Frame: 1 month

2.2 Co-Collection of Source-Separated Garbage, Recyclable and Compostable Materials

The cities of Gaithersburg, Rockville and Tacoma Park use single stream recycling systems. Co-collection of source-separated garbage, recyclables and compostable materials can reduce the number of trucks needed per collection route; and cities have implemented innovative hybrid collection protocols and equipment.

Toronto uses trucks with two compartments to efficiently collect three streams of materials (garbage, recyclables and organic materials) using one truck over a two-week period. Organics are collected every week. Single stream recyclables and garbage are collected every other week, respectively.

This system requires that co-collected materials are delivered to one facility for processing of all materials collected; or, that vehicles unload sequentially at designated processing sites.

Research the feasibility of using co-collection strategies and available equipment to reduce recycling, organics collection costs.

Cost: Staff time; consultant \$10,000

Time Frame: 2 months

2.3 Bulky Item Collection

Currently, bulky items are collected curbsides from households which call in for service. Metal objects are recycled, and non-recyclable items are processed at the Shady Grove transfer station. Bulky item collection is an expensive component of any materials management system. The County could increase the volume of the collection of these items and reduce costs by partnering with a non-profit or commercial subcontractor.

Oceanside, CA, in partnership with Goodwill Industries, now repairs and recycles over 50% of bulky items (furniture, appliances, and mattresses) collected through the bulky item pickup system. The Curb UP program allows households to donate their excess products through curbside pickup and delivery to Goodwill Industries. Rather than being dumped forever in a landfill, these materials remain in the community and help provide jobs through Goodwill's services and programs.¹⁸ This reduces the overall costs of this expensive service and nurtures an array of reuse enterprises.

Determine the feasibility of bulky item-reuse strategies to reduce costs of bulky item pick up and disposal and create jobs through reuse.

Cost: staff time; consultant \$5,000

Time Frame: 1 month

2.4 Special Events

Jurisdictions can provide planning assistance for special event recycling and composting. The County can make a recycling and composting plan a requirement for obtaining permits for events such as festivals, concerts and fairs.¹⁹

Require recyclable and compostable material collection at all special events in the County.

Cost: Staff time

Time Frame: 2 months

2.5 Product bans, landfill bans and take back programs

Montgomery County has banned polystyrene foam, free plastic shopping bags, as have many other jurisdictions. Additional products and materials that harm the environment and overload the materials management system have also been banned by various jurisdictions around the

¹⁸ See www.ci.oceanside.ca.us/news/displaynews.asp?NewsID=1358

¹⁹ See Recycling at Special Events: A Model for Local Government Recycling, www.calrecycle.ca.gov/Publications/Documents/LocalAsst/31002009.doc

U.S. These include aerosol cans, single use food service utensils, polyvinyl chloride food packaging, coffee pods, “brickpack” juice containers and products with phthalates. Outright product bans are typically phased-in to give manufacturers and businesses time to transition to acceptable materials and products. In Montgomery County could also adopt these bans to further reduce its volume of waste.

Forty-seven states have declared bans on at least one product, including electronic scrap and yard trimmings from the waste stream. In Vermont, a 2015 universal ban on recyclable materials from landfills and incinerators has already resulted in a 5% reduction in the state’s overall disposal rate.²⁰ Seattle banned significant amounts of recyclable materials from disposal from homes and apartment houses in 2005 that led to a jump in recycling rates from 59% to 71%. Fresno also imposed a ban on disposal of recyclables from businesses in 2005. Their recycling rate jumped from 32% to 64%.

Yard trimmings have been banned from landfills and incinerators in 20 states.

Take back programs established by the San Luis Obispo County, CA Integrated Waste Management Authority works with local manufacturers and distributors to take back products such as paint, household batteries, fluorescent tubes, CFLs, mercury thermostats, sharps (needles), and unwanted pharmaceuticals. The Integrated Waste Management Authority collects those products from the retailers and then sends them for recycling or proper disposal. The distributors of the products reimburse the Authority.²¹ Even though these items do not represent a significant volume of waste they are important to remove because of their toxicity.

Review product bans, landfill bans and take-back policies and programs from jurisdictions throughout the U.S.

Cost: DEP staff time
Time Frame: 2 months

2.6 Green Procurement and Source Reduction

Waste reduction measures through purchasing protocols have the following features:

- the purchase of products with reduced waste,
- the purchase of recycled products,
- the purchase of products that are reusable,
- the purchase of products that can be recycled,
- the choice of durable, multiple use products, and
- the use of life cycle costing.

²⁰ The landfill disposal ban language already in place for toxic and difficult to manage materials extends to mandated recyclables, leaf and yard debris, and food scraps under the UR law. The UR law indicates that no person shall knowingly dispose of the banned items in solid waste or landfill. See www.ilsr.org/rule/food-scrap-ban/vermont-organics-recovery/ and legislature.vermont.gov/statutes/section/10/159/06621a.

²¹ See www.iwma.com/about/ordinances/

By stating a preference in their procurement protocols, communities can stimulate demand for products that contain recycled materials, last longer, and can be reused. Alameda County, CA saved \$120,000 from 2004-2014 by reducing paper use and purchasing recycled paper. Prince George's County has a checklist of steps local government and businesses can take to reduce waste at its source.²²

City efforts in this area are well documented by San Francisco's Responsible Purchasing Network. City policies can require labeling or illustrations that identify products that last longer.²³

Cities have also prepared comprehensive databases on reuse enterprises for citizens and businesses. These range from longstanding organizations such as Goodwill Industries to smaller neighborhood-based Swap Shops. Many universities have established Move Out programs, in which the school provides drop-off containers for students to deposit unwanted, but valuable, clothes, furniture, computers, and appliances. These goods are then delivered to area churches for distribution to low-income residents.

The Procurement Institute, working with the Urban Sustainability Directors Network, (USDN), created the Sustainable Procurement Playbook for Cities. The Institute is working with a dozen cities that are benchmarking themselves against the best practices identified.

1. Montgomery County is a member of USDN and should participate in this green procurement working group.

Cost: Staff Time

Time Frame: Immediate

2. Research successful procurement policies that have reduced waste and avoid disposal fees at landfills or incinerators to compare these with existing procurement programs in Montgomery County.

Cost: DEP staff time; consultant \$6,000

Time Frame; 2 months

2.7 Container Deposit Law/Bottle Bill

Deposit legislation has worked in states for the past several decades. They are proven to reduce litter, increase recycling rates, increase employment and provide industry with clean materials.²⁴ Maryland had this in the past but it was abolished after lobbying from the bottling

²² See, Bob Sly. "Zero Waste as a Business Decision." Zero Waste San Diego, January 2016.

²³ See, the Responsible Purchasing Network at www.responsiblepurchasing.org. Also, see, SF Approved Use Less Buy the Right Thing, www.sfapproved.org.

²⁴ See, Container Recycling Institute at container-recycling.org.

industry. This legislation could be reinstated at the state level; however, Montgomery County can pass its own container legislation. A wide range of bottles and cans are eligible for take back reimbursement in several states. At least three states, Maine, New York and Oregon have expanded the type of containers that have deposits.

Reinstate the bottle bill at the County level.

Cost: DEP and County Council staff time

Time Frame: two years

2.8 Resource Recovery Park (RRP)

Montgomery County operates the Shady Grove transfer and recycling center. This facility could be relocated and integrated into a larger Resource Recovery Park (RRP). An RRP is an industrial park reserved for recycling, reuse and composting companies. They have been established in Alachua County, FL, (40 acres) and Austin, TX, (100 acres). In Alachua County, FL, the RRP is integrated with the County trash transfer station and material processing center, MRF. California pioneered in establishing Recycling Market Development Zones (RMDZs) in urban and rural areas of the state.²⁵ Companies that locate in these designated zones benefit from reduced taxes on energy and equipment purchases, low interest loans and loan guarantees. RMDZ's do not have to be contiguous properties. Los Angeles and Ventura County provide RMDZ support to companies that locate on any industrially zoned land in their jurisdictions.

Private companies have approached Carroll County to develop an RRP in conjunction with adjacent counties. Alameda County, CA has set up a revolving loan fund for recycling businesses through its StopWaste program. The fund is financed by a per ton landfill surcharge and provides provide grants, loans and technical assistance to help expand existing recycling businesses and attract new ones. Montgomery County can finance such a loan fund with County and state support.

1. Review operations of RRP's in Austin, Alachua County and California; engage the Maryland Department of Commerce mission under Governor Hogan's recent Waste Reduction and Resource Recovery Executive Order to explore interest in state support for a regional RRP.

Cost: DEP and Montgomery County Economic Development Corporation staff time;
consultant \$5,000

Time Frame: 1 month

²⁵ See, CalRecycle, www.calrecycle.ca.gov/RMDZ/

2. Create a \$5 million revolving loan fund to support and attract recycling, composting and reuse businesses.

Cost: County and state staff time, \$5 million in capital

Time Frame: two years

2.9 Education and Public Awareness

Montgomery County has a multi-phased education and public awareness program, including in-school instruction and annual public awards programs.

1. Assess and evaluate the current in-school and public awareness programs for their effectiveness; prepare a targeted program developed to increase community participation in under-performing initiatives.
2. Integrate commercial and industrial internships for high school juniors and seniors and community college students into recycling curricula to introduce young people to blue collar and professional jobs and careers in materials management and recycling, composting and reuse.

Cost: DEP staff time and consultant \$5,000

Time Frame: 2 months

2.10 Special Arrangements with Selected Companies and Industries

A number of companies and associations provide assistance to cities to expand recycling and add value to recovered recycled materials. Ripple Glass Company and Strategic Materials, Inc. work in several cities to recover high quality glass, even as many companies exclude glass from curbside collection. These companies need the glass for new containers, abrasives, and insulation products. Ripple Glass hauls glass for the glass recycling program in Fayetteville, AR, at no charge to the city. In Nashville, the city initiated a pilot commercial glass recycling with bars and restaurants. Metro Public Works is using its trucks to pick up glass bottles twice a day, seven days a week. The department says it is researching ways to reuse and recycle the glass locally. The Glass Packaging Institute recently initiated a technical assistance program for cities interested in recovering more glass from their discards. Other companies want glass for the abrasives and cement industries. Baltimore County succeeded in attracting QRS, Inc., which manufactures products from mixed recycled plastic. Baltimore has also attracted RoadRunner, an innovative company that specializes in commercial recycling using existing infrastructure to reduce costs through recycling.²⁶ eWorks is an electronic scrap deconstruction company, which developed a successful program in partnership with Melwood; a non-profit agency that serves challenged workers in Prince George's County, MD.

²⁶ See, www.ilsr.org/the-small-private-sector-to-the-rescue-roadrunner-recycling-inc/.

In Boulder, CO, Ecocycle has developed a working relationship with a mattress recycling company. The non-profit organization serves as a drop off site for mattresses and box springs, which are picked up by the private company. Local environmentalists and legislators are developing a mattress recycling bill for Maryland.

One regional company, Aero Aggregates, Eddystone, PA has commercialized foam glass aggregate production for roadways, and other construction projects. It is seeking sources of glass for its factory.²⁷

1. Convene a daylong workshop with companies interested in expanding into Montgomery County in conjunction with the Maryland Department of Commerce.
2. Develop an economic incentive program in conjunction with the State Department of Commerce and the Montgomery County Economic Development Corporation.

Cost: DEP, Montgomery Economic Development Corporation and Maryland Department of Commerce staff time.

Time Frame: 2 months

Recommended Advisor: Paul Spies, Maryland Department of Commerce, Waste and Energy Efficiency Program

Conclusion

Considering Montgomery County's current materials management infrastructure and based on the experience of numerous jurisdictions around the country, the County should be able to achieve a 70% recycling rate in 4 to 6 years leaving approximately 340,000 tons of materials to go to landfill and nothing being incinerated. Currently, the county is sending 180,000 tons of toxic ash to landfill annually, so this is still a considerable net gain.

Another four years of work on incentive programs, changing legislation and developing reuse and repurpose strategies both in the public and private sector should bring the County to a 90% diversion rate with very small amounts still going to landfill.

As noted above in the Summary of Findings, the County could eliminate the use of the garbage incinerator at any time once rail haul arrangements for remaining waste generated in Montgomery County.

²⁷ Herb Northrop, Chief Operating Officer, Aero Aggregates, 1500 Chester Pike, Eddystone, PA, 19022, 610 447 8900, herbn@aeroaggregates.com.

Appendix A: Additional Resources

The U.S. EPA has developed a tool for communities pursuing Zero Waste strategies (with assistance from Zero Waste USA/Zero Waste Brain Trust):

“Managing and Transforming Waste Streams: A Tool for Communities” provides information about 100 different policies and programs with references and examples from around the country.²⁸



The screenshot shows the EPA website interface. At the top left is the EPA logo with the text 'United States Environmental Protection Agency'. To the right is a search bar. Below the logo is a blue navigation bar with three links: 'Environmental Topics', 'Laws & Regulations', and 'About EPA'. The main content area has a title 'Managing and Transforming Waste Streams: A Tool for Communities'. Below the title is a dark blue box with the text 'Helping Communities Plan for Less Waste' and a list of four links: 'Learn About the Tool', 'Go to the Tool', 'Go to the Policy and Program Impact Estimator', and 'Browse Examples By Topic'. To the right of this box is a graphic of a globe with green leaves and a green circular arrow. Below the graphic is a quote: 'Waste is a valuable resource. Communities can recover the lost value of material discards by setting up systems for reuse, recycling, and composting.'

Zero Waste USA has developed additional tools and resources and provides Zero Waste trainings and certifications.²⁹

²⁸ See www.epa.gov/transforming-waste-tool

²⁹ See www.zerowasteusa.org

Appendix B: Preliminary Cost Comparison

Comprehensive Recycling (70%+) diversion from the Covanta-run incinerator vs. Continued Use of incineration as Primary Solid Waste Management Approach in 2021

As noted in the Memorandum, the figures in this Appendix are estimates using the figures from official County reports. ILSR did not have an opportunity to review these calculations with the Montgomery County DEP.

ILSR estimates that the implementation of Phase 1 recommendations would allow Montgomery County to divert a total just under 900,000 tons of materials from the incinerator; requiring the landfilling of just over 200,000 tons of municipal solid waste annually.

Estimated Costs of Recycling

+ Net Cost of Recycling 888,000 tons estimated at \$60 per ton, or **\$53 million**.

Current cost is \$57 per ton. ILSR assumes a \$3 per ton cost of recycling increase due to amortization over 25 years of an estimated \$30 million for renovation of Shady Grove recycling processing facility, co-composting food scraps and yard trimmings composting facility at Dickerson, increased enforcement, education/public awareness and technical assistance to the commercial sector.

+ Cost of Transfer 212,000 tons of discarded materials from the Shady Grove Transfer Station to landfills estimated at \$10 per ton, or **\$2 million**

+ Cost of Landfill of 212,000 tons, conservatively estimated at \$55 per ton, or **\$11 million**

Total estimated operating cost, or **\$66 million**

Estimated Costs Avoided

Estimated Avoided Costs of not incinerating 700,000 at \$73, or **\$51 million**.

Cost of transfer (at Shady Grove facility) 700,000 tons estimated at \$10 per ton, or **\$7 million**

Cost of Landfilling ash (150,000 tons @ \$51), or **\$8 million**.

Cost of annual membership to Northeast Maryland Solid Waste Disposal Authority **\$0.45 million**

Total estimated avoided costs on non-incineration, or **\$66.45 million**

ILSR’s preliminary estimates indicate that the Montgomery County implement comprehensive recycling, composting and reuse at an annual cost of **\$66 million**; compared with avoided annual costs of eliminating the incinerator of **\$66.45 million**.

Appendix C: Zero Waste Hierarchy

The internationally peer-reviewed Zero Waste Hierarchy, developed by the Zero Waste International Alliance:

