

# MONTGOMERY COUNTY MARYLAND

## Aiming for Zero Waste

Task 5: Considered Enhancements/Expansions to the Current Diversion/Recycling System  
Technical Memorandum #3 – Summary Report

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## 1 Introduction

The Montgomery County Department of Environmental Protection, Solid Waste Services Division, is developing a vision for materials management in the County. The Aiming for Zero Waste Plan (Plan) will strategically evaluate the County's programs and facilities to guide the County's actions and investments over the next 20-plus years.

Montgomery County (the County) has a robust and well-established waste management system with a number of waste management facilities integrated into the system to provide the County and its customers with a very high level of service including a Material Recycling Facility (MRF), the Shady Grove Processing Facility and Transfer Station, the Resource Recovery Facility, the Montgomery County Yard Trim Composting Facility, closed landfills, and land designated for future landfill capacity.

The County has an extensive suite of services and programs designed to reduce waste, and increase reuse, recycling, and buying recycled, supported by a comprehensive education, technical assistance, and enforcement program. The County has also taken the proactive step of developing regulations to guide their waste management program.

This report presents proposed improvements to the current diversion/recycling system and is the third in a series of reports developed in support of the project. The purpose of this report is to document potential options for the County to consider which may improve diversion or recycling and assist the County in aiming for Zero Waste.

## 2 Options for Consideration

The following sections outline groupings of options for the County's consideration that will increase diversion and assist with achieving the County's zero waste vision. These options have been grouped into reduction and reuse, recycling, food waste diversion, C&D materials diversion, recovery parks, and regulatory options. Additional initiatives intended to support existing programs have been discussed which, indirectly, will support waste reduction and waste diversion. These options will also support the County's goals of reducing GHG emissions. Estimates developed for tons reduced/diverted, GHG emissions reductions, etc., represent participation by residents (some just for Sub-district A&B) and commercial establishments in the County in the options as appropriate. These estimates will be refined in the next stage of the project.

Ultimately, the options described in the following sections may be carried forward for further consideration for implementation in the short term (2020-2025), mid-term (2026 – 2030) and long-term (2030 +).

### 3 Waste Reduction and Reuse

The following table presents an overview of the waste reduction and reuse options considered.

ES Table 1 Waste Reduction & Reuse Options

	Food Waste Reduction Recommendations	Fix-it / Repair Clinics	Reuse Centers	Materials Exchange	Support Reuse Events	Sharing Libraries
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Promote engagement with Food Rescue US to generators, volunteer organizations, and food pantries to.</li> <li>Support the development or implementation of a mobile app designed to reduce food waste through donation or quick sales, such as Food Rescue’s ChowMatch app or the Food for All app.</li> <li>Implement a food waste reduction campaign such as the “Food: Too Good To Waste” or “Love Food Hate Waste.”</li> <li>Collaborate with with other County departments/divisions to identify opportunities to rescue and divert food.</li> </ul>	<ul style="list-style-type: none"> <li>Establish or support Fix-it/Repair Clinics</li> <li>This option has the potential to divert unwanted material from disposal and provides an educational opportunity to teach residents how to use tools and repair broken items.</li> </ul>	<ul style="list-style-type: none"> <li>Establish a reuse center in the County at a recycling/drop-off facility that accept a broad range of materials in a convenient location for residents.</li> <li>Promote the current reuse systems in the County to encourage residents to donate and purchase second hand items.</li> </ul>	<ul style="list-style-type: none"> <li>Establish or support a materials exchange network to facilitate reuse of surplus materials, used goods, etc.).</li> <li>Support community/neighborhood exchanges.</li> </ul>	<ul style="list-style-type: none"> <li>Support reuse events that allow residents to obtain gently used materials for reuse in a convenient, yet structured way so that the events do not contribute to litter or illegal dumping.</li> <li>The events could include garage sales, curbside giveaway events in common areas (for multi-residential buildings) or at curbside (for single-family households), swap events (e.g., parent-to-parent sales, jewelry or clothing exchanges).</li> </ul>	<ul style="list-style-type: none"> <li>Support the development of sharing libraries through a partnership with existing organizations (e.g. public library).</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 2,200 to 2,800 tpy.</li> <li>Supports waste diversion in the system as a whole.</li> </ul>	<ul style="list-style-type: none"> <li>Very small potential for additional diversion (estimated at 20-60 tpy).</li> <li>However supports waste diversion in the system as a whole.</li> </ul>	<ul style="list-style-type: none"> <li>Medium potential for additional diversion (estimated at 1,300 to 4,000 tpy) depending on what materials are accepted and type of facility. Supports waste diversion in the system as a whole.</li> </ul>	<ul style="list-style-type: none"> <li>Very small potential for additional diversion (estimated at 20-60 tpy).</li> <li>However supports waste diversion in the system as a whole.</li> </ul>	<ul style="list-style-type: none"> <li>Very small potential for additional diversion (estimated at 20-60 tpy).</li> <li>However supports waste diversion in the system as a whole.</li> </ul>	<ul style="list-style-type: none"> <li>Very small potential for additional diversion (estimated at 20-60 tpy).</li> <li>However supports waste diversion in the system as a whole.</li> </ul>
<b>Net GHG potential (MTCO2e)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -7,900 to -9,900.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1000 to -2900.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -3,800 to -11,400. Would depend on type of materials managed.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,100 to -3,200.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,000 to -2,900.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,000 to -2,900.</li> </ul>

	Food Waste Reduction Recommendations	Fix-it / Repair Clinics	Reuse Centers	Materials Exchange	Support Reuse Events	Sharing Libraries
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>May be some capital costs associated with constructing a sheltered area to house goods collected for reuse.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with promotion and education, staff time to develop and execute targeted campaigns, may be licensing costs associated with certain programs.</li> <li>Annual costs for staffing and outreach for the first three years range from \$245,000 to \$85,000 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with organizing and/or promoting events.</li> <li>Annual costs for staffing and outreach for the first three years range from \$122,500 to \$62,500 from implementation to ongoing operation of program.</li> <li>Some annual costs in the order of \$5,200 for facility rental.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with operation of reuse center. Will be included in drop-off/recycling facility costs.</li> <li>Annual costs for staffing and outreach for the first three years range from \$122,500 to \$62,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with organizing and/or promoting site.</li> <li>Annual costs for staffing and outreach for the first three years range from \$122,500 to \$62,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with organizing and/or promoting events.</li> <li>Annual costs for staffing and outreach for the first three years range from \$122,500 to \$62,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some operating costs associated with organizing and/or promoting libraries.</li> <li>Depends on how program is structured and what type of materials are managed.</li> <li>Annual costs for staffing and outreach for the first three years range from \$122,500 to \$62,500 from implementation to ongoing operation of program.</li> <li>Estimated annual costs of \$10,000 for supplies.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth due to use of volunteers.</li> <li>This option provides cost saving opportunities to all residents of the County.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth through construction and operation of reuse centers.</li> <li>This option provides cost saving opportunities to residents through purchase of gently used items.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth if additional staff required.</li> <li>This option provides cost saving opportunities to all residents of the County.</li> </ul>
<b>Process/ Infrastructure/ Siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>No considerations</li> </ul>	<ul style="list-style-type: none"> <li>Could be sited at a community center or other public venue.</li> <li>Would require locating suitable venues on an ongoing basis.</li> </ul>	<ul style="list-style-type: none"> <li>May require some infrastructure to house a reuse center, which could be housed at drop-off depot</li> <li>Would need to find one or more locations that are conveniently located for residents, but away from receptors.</li> <li>Facility would require permitting as part of drop-off depot.</li> </ul>	<ul style="list-style-type: none"> <li>No considerations</li> </ul>	<ul style="list-style-type: none"> <li>No considerations</li> </ul>	<ul style="list-style-type: none"> <li>Could be located within an existing library.</li> <li>Would require identifying facilities with sufficient space and resources.</li> </ul>

	Food Waste Reduction Recommendations	Fix-it / Repair Clinics	Reuse Centers	Materials Exchange	Support Reuse Events	Sharing Libraries
Level of effort/ Implementation considerations	<ul style="list-style-type: none"> <li>Requires ongoing education and outreach.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing education and outreach.</li> <li>If County in charge of clinics, would require soliciting volunteers on an on-going basis.</li> </ul>	<ul style="list-style-type: none"> <li>Would require effort by County to find a location, construct facility, maintain and potentially operate facility.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing effort to maintain site.</li> <li>Requires ongoing education and outreach.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing education and outreach.</li> <li>Requires updates to website and other social media.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing education and outreach.</li> <li>May require County to identify potential locations to house sharing library and partners to run program.</li> </ul>
Availability of Facilities/ Vendors	<ul style="list-style-type: none"> <li>There are existing food waste reduction strategies that could be implemented.</li> </ul>	<ul style="list-style-type: none"> <li>Would need to locate a space in which to hold events - however, could be located in community space.</li> <li>Requires volunteers to assist with repairs.</li> </ul>	<ul style="list-style-type: none"> <li>County would need to develop a facility.</li> <li>Likelihood of finding an organization to operate facility is high if County does not want to operate.</li> </ul>	<ul style="list-style-type: none"> <li>Likelihood of finding an agency to operate materials exchange is high.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities/vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>Would need to find a facility to host sharing library.</li> <li>Could be located within an existing library or County facility.</li> </ul>

### 3.1 Recommendations for Waste Reduction and Reuse Options

The following actions are recommended in the short-term (2020-2025) for waste reduction and reuse options:

- Explore national existing food waste reduction campaigns and/or consider developing a County-specific campaign.
- Collaborate with other County departments/divisions to identify opportunities to rescue and divert food.
- Explore the feasibility of implementing one or more reduction/reuse options. Options such as fix-it or repair clinics provide a dual purpose of diverting materials from disposal as well as educating residents on how to repair and prolong the life of items.
- Explore how reuse centers might be incorporated into the waste management program, perhaps in conjunction with other options discussed in this report such as public/small hauler drop-off depots or resource recovery parks. Alternatively (or in addition) actively promote existing reuse opportunities in the County.
- Explore the feasibility of establishing or supporting existing materials exchange platforms and/or reuse events.

While these options do not divert significant quantities of materials, they are important elements of a waste management program, intended to promote waste reduction and reuse and educate residents on the hierarchy of waste management.

## 4 Recycling of Additional Materials

The following table presents an overview of the options for recycling additional materials.

ES Table 2 Recycling of Additional Materials

	Mattress Recycling	Carpet Recycling	Textile Recycling	Porcelain and Ceramic Recycling
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Collect mattresses for recycling.</li> <li>Support development of an EPR program for mattresses.</li> </ul>	<ul style="list-style-type: none"> <li>Collect carpets and rugs for recycling.</li> <li>Advocate for development of EPR programs.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a textile diversion awareness campaign and collection strategy to keep textiles from disposal, including supporting existing non-profit infrastructure and assisting with expansion where possible.</li> <li>Collection could be incorporated into other collection programs or through partnerships with for-profit or non-profit organizations.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a strategy to divert porcelain and ceramic materials from disposal which could include collecting these materials at Shady Grove for recycling.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 200-700 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 2,100 - 3,100 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 4,000 - 5,000 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 20 - 70 tpy.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -300 to -1,000.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -7,100 to -10,700.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -13,800 to -17,200.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal potential reduction in GHG emissions.</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Costs associated with collection, storage, transportation and processing ranging from \$135,000 to \$390,000.</li> <li>Annual costs for staffing and outreach for the first three years range from \$245,000 to \$125,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Costs associated with collection, storage, transportation and processing ranging from \$40,000 to \$70,000.</li> <li>Annual costs for staffing and outreach for the first three years range from \$245,000 to \$125,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>If private company provides collection, County would incur minimal costs related to collection and processing.</li> <li>Potential for revenue @\$20 per ton estimated at \$80,000 to \$100,000.</li> <li>Annual costs for staffing and outreach for the first three years range from \$245,000 to \$125,500 from implementation to ongoing operation of program.</li> </ul>	<ul style="list-style-type: none"> <li>Annual costs estimated at \$2,000 for collection/processing.</li> <li>Annual costs for staffing and outreach for the first three years range from \$245,000 to \$125,500 from implementation to ongoing operation of program.</li> </ul>

	<b>Mattress Recycling</b>	<b>Carpet Recycling</b>	<b>Textile Recycling</b>	<b>Porcelain and Ceramic Recycling</b>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>• Potential for some local economic growth if recycling conducted in County.</li> <li>• Good potential for job creation associated with collection of materials and recycling components if recycling facility is local.</li> <li>• Difficult to assess at this time as there is no currently no feasible opportunity to recycle mattresses within Montgomery County.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for some local economic growth if recycling conducted in County.</li> <li>• Good potential for job creation associated with collection of materials and recycling components if recycling facility is local.</li> <li>• Difficult to assess at this time as there is no currently no feasible opportunity to recycle mattresses or carpets</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for job creation associated with collection and recycling of materials, depending on how program is operated.</li> <li>• Some potential for competition with local non-profits depending on how program is delivered, with some potential for job loss if delivered by for-profit organization.</li> <li>• Potential for some potential local economic growth in managing textiles at charities and through market development for reuse or recycling of textiles.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no job creation associated with this option.</li> </ul>
<b>Processing /Infrastructure considerations /requirements</b>	<ul style="list-style-type: none"> <li>• Requires storage of collected units, potentially in a tractor trailer or storage container.</li> <li>• Would need to site a tractor trailer/container to store materials, most likely at Shady Grove.</li> <li>• Unlikely to need permitting if located at waste management facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires storage of collected material, potentially in a tractor trailer or storage container.</li> <li>• Would need to site a tractor trailer/container to store materials, most likely at Shady Grove.</li> <li>• Unlikely to need permitting if located at waste management facility.</li> </ul>	<ul style="list-style-type: none"> <li>• Minimal to no processing or infrastructure requirements if collected at curb and hauled/picked up by third party.</li> </ul>	<ul style="list-style-type: none"> <li>• Would need a container to collect materials, likely at Shady Grove.</li> <li>• Requires a processor for materials.</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> <li>• Would require County to find a processor and store mattresses in a tractor trailer for transport to processing facility.</li> <li>• May require separate curbside collection or collection at a depot.</li> <li>• County would need to identify most cost-effective way of collecting materials so ensure stay clean and dry.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> <li>• Would require County to find a processor and store materials in a tractor trailer for transport to processing facility.</li> <li>• May require separate curbside collection or collection at a depot.</li> <li>• County would need to identify most cost-effective way of collecting materials so ensure stay clean and dry.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> <li>• Less effort compared to other options if private service provider implements program.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> <li>• Requires storage area at depot.</li> </ul>
<b>Availability of Facilities/ Vendors</b>	<ul style="list-style-type: none"> <li>• At this time there are limited facilities to recycle collected materials.</li> </ul>	<ul style="list-style-type: none"> <li>• At this time there are limited to no facilities to recycle collected materials within a reasonable haul distance.</li> </ul>	<ul style="list-style-type: none"> <li>• There are many organizations who could implement this program.</li> </ul>	<ul style="list-style-type: none"> <li>• Limited vendors who may be interested in accepting this material.</li> </ul>

## 4.1 Recommendations for Recycling Additional Materials

The following actions are recommended for waste reduction and reuse options:

- In the short-term (2020-2025), develop a textile diversion awareness campaign and collection strategy to keep textiles from disposal, including supporting existing non-profit infrastructure and partnering to assist with expansion of textile diversion where possible. This could include development of a curbside textile collection service.
- In the mid-long term (2026-2030):
  - Recognize and promote the use of existing mattress recycling programs. Potentially partner with existing mattress recyclers to develop a mattress collection program. Advocate to the State for funding through grants by manufacturer fees or identification of service providers who can provide recycling services.
  - Continue to monitor markets and developments in carpet recycling. Recognize and promote the use of existing programs for reuse. Advocate to the State for funding through grants by manufacturer fees or identification of service providers who can provide recycling services.
- In the long-term (2030+), consider separating ceramic materials from other C&D materials during bulk trash collection. Consider developing a partnership with a non-profit organization to manage these materials.

## 5 Diversion of Food Scraps and Other Organics

The following table presents an overview of the options for diverting residential organics and supporting initiatives for diversion of additional organics through composting.

ES Table 3 Organics Options

	Full Scale Residential Curbside Organics Program	Community Composting Facility	Backyard Composting
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>• Organics (food waste and non-recyclable paper) collection is provided for all residential and/or commercial accounts. Initially this would target single-family homes, with potential for future expansion to address multi-family generators.</li> <li>• County would implement a pilot program (multi-year, 8,000 homes), followed by the rollout of a full-scale program to residents in single family homes in Sub-district A&amp;B.</li> <li>• County would develop a processing facility to manage food scraps.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop and support options for community composting</li> <li>• Support community composting through financial incentives/grants or through staffing support, promotion and education, etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage backyard composting as a method to manage a portion of the organics and build awareness of waste reduction.</li> <li>• Supply subsidized backyard composters that are fully enclosed to discourage vermin.</li> <li>• Examine current ordinances to encourage backyard composting.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>• Potential to divert an estimated 10,400 to 17,600 tpy of organics from SF residents in Sub-districts A&amp;B.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential to divert an estimated 20 to 60 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential to divert an estimated 600 to 1,400 tpy.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>• Net GHG emissions in order of -300 to -500.</li> </ul>	<ul style="list-style-type: none"> <li>• Net GHG emissions in order of -1 to -2.</li> </ul>	<ul style="list-style-type: none"> <li>• Net GHG emissions in order of -20 to -40.</li> </ul>

	Full Scale Residential Curbside Organics Program	Community Composting Facility	Backyard Composting
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Capital costs related to pilot in the order of \$438,000 (1-2 year pilot, 8,000 homes) for containers and studies.</li> <li>Capital costs for full scale program for provision of containers to remaining residents in the order of \$10.8 million.</li> </ul>	<ul style="list-style-type: none"> <li>Capital costs in the order of \$5,000 for construction of composters.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Pilot - Annual operating costs for pilot in the order of \$300,000 for collection and processing.</li> <li>Staffing costs and outreach materials in year 1 and 2 in the order of \$290,000 and \$240,000. Waste audits estimated at \$30,000 (conducted prior to implementation and during programs).</li> <li>Full Scale Program - Annual operating costs in the order of \$7.3 million for collection, processing. Waste audits estimated at \$80,000 (conducted prior to implementation and during programs).</li> <li>Staffing/outreach costs range from \$870,000 for implementation in year 1, \$580,000 in year 2 and \$430,000 for remaining years.</li> </ul>	<ul style="list-style-type: none"> <li>Operating expenses in the order of \$1,000 for miscellaneous supplies.</li> <li>Estimated costs for staffing and outreach for each program – year 1 \$390,000, year 2 \$245,000 and for following years, \$170,000.</li> </ul>	<ul style="list-style-type: none"> <li>Some operating costs associated with subsidizing composting units.</li> <li>Assuming County sells 200 composters a year and subsidizes them by \$60, annual operating costs estimated at \$12,000.</li> <li>Estimated costs for staffing and outreach for each program – year 1 \$390,000, year 2 \$245,000 and for following years, \$170,000.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>May require additional staff for collection of organics.</li> <li>Potential for job creation and economic growth through provision and maintenance of containers and supplies.</li> <li>Potential for additional staff required for collection.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth or job creation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth or job creation.</li> </ul>
<b>Process/Infrastructure/siting/permitting considerations</b>	<ul style="list-style-type: none"> <li>Will need to do a business case and pilot prior to full-scale implementation.</li> <li>Will require processing capacity for collected material - either private or County owned.</li> <li>Depending on location of processing facility, may need an organics transfer station.</li> <li>Development of organics processing facility considered separately.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no processing considerations as material will be processed on site.</li> <li>Will need to find a site to develop composting facility although it is likely could be located at community gardens.</li> <li>Very small footprint required.</li> <li>May require a change in County ordinance regarding management of food scraps.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no processing considerations as material will be managed at user's residence.</li> <li>No siting requirements.</li> <li>May require a change in County ordinance regarding management of food scraps.</li> </ul>
<b>Level of effort/Implementation considerations</b>	<ul style="list-style-type: none"> <li>Requires significant effort to implement.</li> <li>Would require pre/post waste audits, a multi-year pilot and full scale rollout.</li> <li>Requires procurement for building, collection and processing.</li> </ul>	<ul style="list-style-type: none"> <li>Very little effort required of County. Some degree of oversight, operation and maintenance of sites.</li> <li>Requires organizers to enlist help to operate facility.</li> </ul>	<ul style="list-style-type: none"> <li>Some effort required by County to procure and store containers, and develop a system to make them available to the public.</li> <li>Will require some way for residents to purchase containers at a reduced price.</li> </ul>
<b>Availability of Facilities/Vendors</b>	<ul style="list-style-type: none"> <li>At this time, there is limited availability of existing processing facilities that have capacity to manage County's food scraps.</li> <li>County may have to develop its own facility.</li> </ul>	<ul style="list-style-type: none"> <li>Likely to be suitable sites at community gardens.</li> </ul>	<ul style="list-style-type: none"> <li>There are many vendors of backyard composters.</li> </ul>

## 5.1 Recommendations for Diversion of Food Scraps and Other Organics

The following actions are recommended in the 2019-2024 time frame to begin to implement a curbside organics collection program in Montgomery County:

- Begin a pilot test of food scraps (vegetative, meat, dairy etc.) and soiled paper separation and diversion in Sub-district A for single-family homes, with the collected scraps going to the MCYTCF.
- Undertake waste composition studies for residential and commercial sources (separately) in pilot areas and before rollout of full-scale program.
- Consult with the commercial sector regarding an ordinance for food scraps diversion and/or rollout of a food scraps program for this sector.
- Rollout a full scale curbside collection program for single family dwellings. Extend to multi-family dwellings at a later date.

The following are recommendations for initiatives to support organics diversion:

- Conduct research and evaluate types of backyard compost bins that are suitable for composting food scraps.
- Consider provision of enclosed compost bins to residents at cost, or subsidized price.
- Make changes to the Montgomery County code to allow for food scraps composting in community composting facilities and in backyards.
- Modify zoning ordinances as needed so that community composting facilities become a permitted use in some zones.
- Consider increased collaboration with community-based stakeholders and other pertinent groups (i.e., The M-NCPPC - Montgomery Parks, Montgomery County Public Schools, Cooperative Extension Service Master Gardeners, and interested residents, multi-family properties, and businesses or organizations) to establish community-scale composting demonstration projects throughout the County.
- Establish a network of County and/or partner staff who will be responsible for the operation of the community composting facilities, with salaries paid by Montgomery County (this is the NYCCP model).
- Engage an experienced organization (such as the Institute for Local Self-Reliance) to conduct appropriate training of designated Montgomery County personnel and affiliated volunteers to operate the facilities.

## 6 Organics Processing Options

The following table presents an overview of the options considered for processing organics.

ES Table 4 Organics Processing Options

	Aerobic Organics Processing Facility	Anaerobic Organics Processing Facility	On-farm Composting
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Develop a composting facility using aerated static pile technology.</li> <li>High range is a fully enclosed facility, Low range is an outdoor facility.</li> <li>Sized for receiving 65K tpy of food waste and ~65K tpy of yard waste bulking material.</li> </ul>	<ul style="list-style-type: none"> <li>Develop an anaerobic digestion (AD) facility.</li> <li>Low range is clean SSO with minimal pre-processing and dedicated plug flow digester.</li> <li>High range is able to manage contaminated feedstock with robust pre-processing.</li> <li>Sized to manage 65K tpy food waste.</li> </ul>	<ul style="list-style-type: none"> <li>County contracts with a series of farms to manage food waste through some undetermined organics processing technology.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Supports diversion of food waste.</li> </ul>	<ul style="list-style-type: none"> <li>Supports diversion of food waste.</li> </ul>	<ul style="list-style-type: none"> <li>Supports diversion of food waste.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>Supports reduction of GHGs from food waste</li> </ul>	<ul style="list-style-type: none"> <li>Supports reduction of GHGs from food waste</li> </ul>	<ul style="list-style-type: none"> <li>Supports reduction of GHGs from food waste</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Capital costs in the order of \$27.7 million to \$70 million depending on technology.</li> <li>Land costs (17 acres) estimated at \$12.75 million. Permitting at \$831,000 to \$2.1 million.</li> </ul>	<ul style="list-style-type: none"> <li>Capital costs in the order of \$27.9 million to \$48.1 million depending on technology.</li> <li>Land costs (2-3 acres) estimated at \$1.5 to 2.25 million. Permitting at \$837,000 to \$1.4 million.</li> </ul>	<ul style="list-style-type: none"> <li>County would not incur any capital costs.</li> <li>Capital costs would be considerably lower due to use of low tech processing and smaller parcel of land.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Annual operating costs in the order of \$4.7 million for operating expenses (equipment, staff etc.) and 1 FTE to support facility development.</li> <li>Potential revenue in the order of \$520,000 for compost.</li> </ul>	<ul style="list-style-type: none"> <li>Annual operating costs in the order of \$4.6 to 5.8 million for operating expenses (equipment, staff etc.) and 1 FTE to support facility development.</li> <li>Potential revenue in the order of \$880,000 for biogas and compost.</li> </ul>	<ul style="list-style-type: none"> <li>County would not incur any operating expenses but would pay a tipping fee.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for economic growth associated with development of organics processing facility.</li> <li>Potential for job creation and economic growth through handling of end-product.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for economic growth associated with development of organics processing facility.</li> <li>Potential for job creation and economic growth through handling of end-product.</li> </ul>	<ul style="list-style-type: none"> <li>Some potential for economic growth and job creation, but not on same scale as other options.</li> </ul>
<b>Process/Infrastructure/siting/permitting considerations</b>	<ul style="list-style-type: none"> <li>Requires the development, siting and permitting of a processing facility.</li> <li>Will need to find a location for a facility which would need permitting.</li> <li>Requires a large plot of land away from receptors.</li> </ul>	<ul style="list-style-type: none"> <li>Requires the development, siting and permitting of a processing facility.</li> <li>Will need to find a location for a facility which would need permitting.</li> <li>Requires a smaller plot of land, compared to aerobic facility, away from receptors.</li> </ul>	<ul style="list-style-type: none"> <li>County regulations do not encourage on-farm composting of food scraps.</li> <li>Would require changes to zoning, regulations and permitting.</li> <li>Continuous monitoring of farms</li> </ul>
<b>Level of effort/Implementation considerations</b>	<ul style="list-style-type: none"> <li>Requires significant effort to implement.</li> <li>Would require RFP for construction and potentially operation of facility.</li> <li>Would require a siting exercise to find a suitable piece of land.</li> <li>Requires oversight of construction and contract administration.</li> </ul>	<ul style="list-style-type: none"> <li>Requires significant effort to implement.</li> <li>Would require RFP for construction and potentially operation of facility.</li> <li>Would require a siting exercise to find a suitable piece of land.</li> <li>Requires oversight of construction and contract administration.</li> </ul>	<ul style="list-style-type: none"> <li>Some effort required by County to locate suitable facilities.</li> <li>Less effort compared to other options, but still requires County to source sufficient capacity for all organics managed.</li> </ul>

	Aerobic Organics Processing Facility	Anaerobic Organics Processing Facility	On-farm Composting
Availability of Facilities/Vendors	<ul style="list-style-type: none"> <li>There are vendors of aerobic technology and companies that could operate a facility.</li> </ul>	<ul style="list-style-type: none"> <li>There are vendors of anaerobic digestion technology and companies that could operate a facility.</li> </ul>	<ul style="list-style-type: none"> <li>It is unknown how many facilities are available to manage this waste and their capacity.</li> </ul>

## 6.1 Recommendations for Organics Processing

The following actions are recommended in the short term (2020-2025) to begin to develop capacity for recycling organics in Montgomery County:

- Develop a business case to support organics management which would include, current and future state assessment, tonnage projections, impact of County and State legislation, project options (technology, ownership, procurement approaches).
- Negotiate Memoranda of Understanding and/or contracts with the out-of-County composting facilities willing to accept food scraps for short term capacity or if County decides against a County-owned facility.
- Investigate feasibility of processing food scraps from pilot program at MCYTCF.
- To make more room for other operations and to reduce safety risks to citizens, relocate the yard trim grinding operation from the Shady Grove MRF/Transfer Station complex to Gude Landfill following completion of remediation (2023).
- Construct an organics-only transfer station at Shady Grove for more cost-effective transport of organics to out-of-County locations.
- Conduct a siting study to locate suitable areas for potential development of an in-County composting and/or anaerobic digestion facility.
- Identify procurement model and initiate procurement process for development of organics processing facility.
- Commence construction of organics processing facility for operation in 2026.

## 7 Recovery Options

The following table presents an overview of the options considered to recover materials.

ES Table 5 Recovery Options

	C&D Materials	Resource Recovery Parks	Citizen/Small Hauler Drop-off/Disposal Centers
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Encourage C&amp;D materials diversion through additional or updated ordinances (such as additional C&amp;D diversion or deposit programs).</li> <li>Construct a C&amp;D materials recycling facility.</li> </ul>	<ul style="list-style-type: none"> <li>Develop a Resource Recovery Park in Montgomery County.</li> <li>The County could consider co-locating a new MRF, a composting or AD facility, yard trim grinding facility, a C&amp;D facility and a resident/small hauler drop-off/reuse center at a new site.</li> <li>Development of a resource recovery park at an alternative location could alleviate strain and congestion on Shady Grove and result in more efficient operations at that location.</li> </ul>	<ul style="list-style-type: none"> <li>The County develops one citizen/small hauler drop-off/recycling center.</li> <li>Shady Grove is the only viable option for drop-off and disposal of materials.</li> <li>Provision of a drop-off/recycling centers would reduce congestion at Shady Grove and increase convenience for residents/small haulers.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 26,000 to 130,000 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert significant quantities of material, but actual tons difficult to estimate.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert significant quantities of material, but actual tons difficult to estimate as tons may be diverted from Shady Grove.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -18,300 to -91,300.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to reduce GHG emissions depends on materials managed and types of facilities located here.</li> <li>Anticipated to be high.</li> </ul>	<ul style="list-style-type: none"> <li>Reduction in GHG emissions depends on materials managed.</li> <li>Likely to be less than C&amp;D and Resource Recovery Park.</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Low tech facility - Capital and land costs estimated at \$5.25 million,</li> <li>High tech facility - Capital and land costs estimated at \$14 million, Operating costs of \$3 million, permitting and 1 FTE to support development at \$290,000.</li> </ul>	<ul style="list-style-type: none"> <li>Significant capital costs required to construct facilities and infrastructure required for energy distribution. Depends on facilities located here.</li> </ul>	<ul style="list-style-type: none"> <li>Capital costs in the order of \$5.3 million for development of facility, land and permitting.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Low tech facility - Annual operating costs of \$800,000. Permitting and 1 FTE to support development at \$190,000.</li> <li>High tech facility - Annual operating costs of \$3 million. Permitting to support development at \$200,000.</li> <li>Staffing for outreach estimated at 1 FTE. Outreach and staffing costs estimated at \$690,000 for year 1, \$490,000 for year 2 and \$340,000 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Significant operating costs associated with operation of facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Annual operating costs estimated at \$300,000 to \$400,000.</li> <li>Staffing and outreach costs estimated at \$690,000 for year 1, \$490,000 for year 2 and \$295,000 for subsequent years.</li> <li>Planning costs of 1 FTE to support development of facility, \$5,000 to \$7,000 for survey, \$30,000 to \$50,000 for business case.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth. Significant potential for job creation for construction and operation of facility.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth. Significant potential for job creation for construction and operation of facilities.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth.</li> <li>Some potential for job creation as staff will be required for construction and operation of facilities.</li> <li>Less job potential compared to other options.</li> </ul>

	C&D Materials	Resource Recovery Parks	Citizen/Small Hauler Drop-off/Disposal Centers
<b>Process/ Infrastructure/ siting/permitting considerations</b>	<ul style="list-style-type: none"> <li>• Would require planning to locate facilities accessible to public, haulers etc. in a safe, yet convenient manner.</li> <li>• Would need to find land large enough to host planned facilities.</li> <li>• Sizes can range from 5-8 acres.</li> <li>• Will require permitting.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires infrastructure to utilize energy produced on site by facilities.</li> <li>• Would require planning to locate facilities accessible to public, haulers etc. in a safe, yet convenient manner.</li> <li>• Would need to find land large enough to host planned facilities.</li> <li>• Sizes can range from 2.5 acres (Urban Ore, CA) to 53 acres (Waste Mgmt, Davis, CA). Significant effort to obtain a permit for a site with multiple facilities.</li> </ul>	<ul style="list-style-type: none"> <li>• Unlikely to require processing on site.</li> <li>• Will require ability to weigh materials and keep materials separate.</li> <li>• May require separation of areas for paid disposal of trash, areas for diversion and reuse. 3-5 acres required depending on services provided.</li> <li>• Will require permitting.</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>• May requires significant effort to implement.</li> <li>• Would require land acquisition, permitting, construction of facilities and other infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires significant effort to implement.</li> <li>• Would require land acquisition, permitting, construction of facilities and other infrastructure.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires significant effort to site facility, permit and construct facilities.</li> <li>• Less effort required compared to other options.</li> </ul>
<b>Availability of Facilities/ Vendors</b>	<ul style="list-style-type: none"> <li>• There are many facilities in the area that would compete for material.</li> </ul>	<ul style="list-style-type: none"> <li>• County would need to decide what facilities to site at the park.</li> <li>• If County owns facilities, they could be sited at this location.</li> </ul>	<ul style="list-style-type: none"> <li>• County would need to decide what facilities to site at the depot.</li> <li>• High likelihood of non-profit organization willing to run reuse center.</li> </ul>

## 7.1 Recommendations for Recovery Options

### C&D Materials Management

The following are recommendations intended to increase diversion of C&D materials in the short term (2020-2025):

- Consider forming an inter-municipal working group to develop a consistent approach to C&D materials management.
- Undertake a review of existing and potential markets for C&D materials.
- Undertake a multi-season waste audit at Shady Grove to identify quantity and composition of C&D materials.
- Explore opportunities to develop markets for recycled C&D materials, which could include requirements for certain recycled content of materials used by County departments/divisions.
- Investigate ways to increase procurement opportunities to include items with recycled content or derived from diverted materials, including recycled C&D materials for projects such as paving etc.
- Actively enforce the IgCC requirements to ensure construction project waste is being diverted properly.
- Develop an additional C&D diversion ordinance or update the existing ordinance to include deposit programs.
- Conduct a business case for the development of a C&D recycling facility to understand the return on investment for a new facility. As part of this analysis, conduct a survey of tipping fees of private facilities to understand how the tipping fee at Shady Grove compares.
- Conduct a survey of customers currently bringing C&D materials to the Shady Grove facility and their reasons for doing so (cost, convenience etc.). This will help to determine the need for enhancing the current C&D materials handling process at the Transfer Station,

and changes necessary, such as reconfiguring the Transfer Station and/or increasing the tip fee. This information will assist with determining if competing with the private sector will be economical.

- Should the County consider the redevelopment of Shady Grove, depending on options considered as part of the Master Plan, provision for C&D recycling could be included in plans for redevelopment. The County should undertake a business plan for the development of a C&D recycling facility, evaluation of existing and future markets for recovered materials, and partnerships with private C&D facilities. C&D recycling could be accomplished at a resource recovery park.

In the mid-long term (2026-2030), depending on the outcome of the surveys at the Transfer Station, business case and survey of tipping fees, initiate development of the construction of a C&D recycling facility.

### **Resource Recovery Park**

The following are recommendations related to potential development of a resource recovery park in the County:

- Undertake a review of the available space and future role of County-owned sites that could support development of a resource recovery park.
- Based on the recommendations set out in this plan and the outcome of key exercises (such as various business plans and Task 9), develop a 'facilities plan' that summarizes the waste management infrastructure that the County requires in the long-term, and that identifies the approach(es) that the County prefers to secure this infrastructure. The elements that could be included in a resource recovery park could vary based on the County's decision on what infrastructure it chooses to own, and what infrastructure the private sector may be encouraged to develop.
- Undertake a business case for the development of a resource recovery park, focusing on the ability of the County to integrate waste management infrastructure in the longer term. As noted in preceding sections, C&D materials recycling could be integrated into a resource recovery park.

### **Citizen/Small Hauler Drop-off/Recycling Centers**

The following are recommendations for the short to mid-term (2020-2030) related to potential development of drop-off/recycling centers in the County:

- Per above, undertake a review of the available space and future role of County-owned sites that could support development of drop-off/recycling centers.
- Undertake a review of available reuse stores and infrastructure that is available for residents and businesses, to determine if development of a new recycling and drop-off center is required, and if so, where and how one could be developed.
- Identify potential services provided at the drop-off/recycling centers depending on location and type of user (e.g. reuse store, roll off bins for divertible materials, HHW collection etc.). Depending on available staffing and space constraints, some drop-off/recycling centers could focus only on accepting divertible materials, while others could also allow for drop-off of waste for disposal.

- Identify potential partners to manage reuse and/or recycling activities.
- Conduct a data-gathering exercise at Shady Grove to identify where small haulers and citizens are coming from to assist in identifying potential future locations of drop-off depots.
- Develop a business case for the development of one or more drop-off/recycling centers in the County.

## 8 Regulatory Approaches

The following tables present an overview of the options considered for banning or reducing the use of plastics and single-use items, as well as bans on commercial food waste and other State or county regulations that could be implemented.

ES Table 6a Regulatory Approaches

	Ban Single-use Plastic Shopping Bags	Reduce EPS	Reduce Single-use Plastic Water Bottles	Reduce Single-use Food Service Ware	Reduce Single-use Plastic Film Packaging
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Enact a ban on all single-use plastic bags thinner than 4.0 mil in retail establishments (as defined in existing bag tax legislation) including farmers markets and imposes a ten-cent fee on paper bags.</li> </ul>	<ul style="list-style-type: none"> <li>Expand the Montgomery County ban on EPS food packaging for retail sale and distribution to include all non-durable EPS products such as coolers, raw meat and seafood trays and additional packing foam besides peanuts.</li> <li>Durable EPS products such as floatation material for dock construction, wall insulation, and surfboards would be exempt.</li> </ul>	<ul style="list-style-type: none"> <li>Work with the State of Maryland to implement container deposit legislation for plastic bottles.</li> <li>Install refillable water stations throughout Montgomery County to encourage refillable water bottle use.</li> <li>Pass a law banning use of single-use water bottles in all Montgomery County offices.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce use of disposable food service ware by revising existing EPS law to include straws only upon request and impose a 25-cent fee on disposable utensils and take-out containers.</li> </ul>	<ul style="list-style-type: none"> <li>Work directly with businesses to reduce the amount of plastic packaging of products sold in Montgomery County.</li> <li>Educate customers that plastic film may be recycled at collections centers.</li> <li>Work with National Stewardship Action Council to start an EPR policy.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 500 to 1,000 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 30 to 40 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 400 to 900 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 600 to 900 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 100 to 400 tpy.</li> </ul>
<b>Net GHG potential (MTCO2e)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,500 to -2,900.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -100 to -200.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,200 to -2,000.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,500 to -2,300.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -300 to -1,100.</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>May be some capital costs associated with installation of water fill stations.</li> <li>Could be in the order of \$250,000 depending on the number of stations required (@\$2,500 each installed)</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$167,500 in year 1, \$115,000 in year 2 and \$85,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$167,500 in year 1, \$115,000 in year 2 and \$85,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$167,500 in year 1, \$115,000 in year 2 and \$85,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$167,500 in year 1, \$115,000 in year 2 and \$85,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$167,500 in year 1, \$115,000 in year 2 and \$85,000 in subsequent years.</li> </ul>

	Ban Single-use Plastic Shopping Bags	Reduce EPS	Reduce Single-use Plastic Water Bottles	Reduce Single-use Food Service Ware	Reduce Single-use Plastic Film Packaging
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Minimal to no potential for job creation.</li> </ul>
<b>Process/ Infrastructure/ siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>• Would reduce amount of this problematic material at MRFs, potentially reducing downtime and contamination.</li> <li>• Would require a change to current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• Would reduce amount of this material collected at the curb, requiring less processing at MRF.</li> <li>• Would require a change to current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• Would reduce amounts of this material in recycling program.</li> <li>• A bottle bill would impact recycling program and quantities of beverage containers processed at MRF.</li> <li>• This could be both a plus and a negative.</li> <li>• A bottle bill would require State Law, ban on water bottles at County offices may not require an ordinance.</li> <li>• Need to identify where water fill stations could be located.</li> </ul>	<ul style="list-style-type: none"> <li>• Could reduce quantities of this material in trash.</li> <li>• Would require a change to current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• Would reduce amount of this problematic material at MRFs, potentially reducing downtime and contamination.</li> <li>• Would require a change to current ordinance.</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>• Requires ongoing education, outreach and enforcement.</li> <li>• Lower level of effort as is an extension of current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education, outreach and enforcement.</li> <li>• Lower level of effort as is an extension of current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> <li>• Requires some effort to procure, install and maintain water fill stations.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires ongoing education and outreach.</li> </ul>
<b>Availability of Facilities Vendors</b>	<ul style="list-style-type: none"> <li>• No facilities/vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>• No facilities/vendors required.</li> <li>• May require retailers to locate alternate packaging suppliers.</li> </ul>	<ul style="list-style-type: none"> <li>• Many vendors of water fill stations.</li> </ul>	<ul style="list-style-type: none"> <li>• No facilities/vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>• No facilities/vendors required.</li> </ul>

ES Table 6b Regulatory Approaches - Continued

	Bans on Commercial Food Waste	Multi-family Building Design Guidelines	Franchising Commercial Waste Collection	State Legislation	C&D Materials	Special Events
Description of Option	<ul style="list-style-type: none"> <li>Implement an ordinance requiring commercial establishments to divert food scraps.</li> <li>Ordinance can ban organic waste from disposal or require subscription to a collection service to divert organics.</li> <li>Ordinance may have exemptions based on distance from an organics processing facility.</li> <li>Ordinances may be phased in over time or by generation rates.</li> <li>Ordinances may be structured to provide flexibility in how food waste is diverted (e.g. through donation, for animal feed, composting or anaerobic digestion).</li> </ul>	<ul style="list-style-type: none"> <li>Develop guidelines for developers to design properties that encourage diversion and to ensure diversion is as convenient as disposal.</li> <li>Update the existing regulations to include organics diversion if a program is implemented.</li> <li>Developers would be required to submit a materials management plan as part of the permitting process.</li> </ul>	<ul style="list-style-type: none"> <li>Implement commercial waste collection franchising.</li> <li>Franchising could create more efficient collection truck routes.</li> <li>County could specify designated truck routes and transfer and disposal facilities for receiving waste resulting in less wear and tear on roads and facilities.</li> <li>Recyclable collection services can be exempted from franchising fees.</li> <li>The County could realize financial benefits from franchising.</li> </ul>	<ul style="list-style-type: none"> <li>Advocate for a State Bottle Bill (aka container deposit legislation) and/or, Extended Producer Responsibility (EPR) of various materials</li> </ul>	<ul style="list-style-type: none"> <li>Recover C&amp;D materials through an updated or new ordinance.</li> <li>The ordinance could require construction projects to divert at least 50% of C&amp;D waste from disposal.</li> <li>The County could also consider increasing the tipping fee for C&amp;D materials at Shady Grove.</li> </ul>	<ul style="list-style-type: none"> <li>Develop an ordinance to require special event recycling and/or composting.</li> </ul>
Waste diversion potential	<ul style="list-style-type: none"> <li>Potential to divert 31,200 to 46,800 tons annually of food waste from commercial establishments.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 1,100 to 2,200 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>It is difficult to quantify waste reduction potential that would result from franchising. Assume &gt;1,000 tpy</li> </ul>	<ul style="list-style-type: none"> <li>Tons diverted would depend on what materials are covered, but significant potential to divert waste.</li> </ul>	<ul style="list-style-type: none"> <li>Ordinance would support existing regulations regarding IgCC requirements and would result in increased diversion.</li> <li>Tons diverted would depend on what materials are covered, but significant potential to divert waste.</li> </ul>	<ul style="list-style-type: none"> <li>Tons diverted would depend on what materials are covered, but significant potential to divert waste depending on number of events.</li> </ul>
Net GHG potential (MTCO <sub>2</sub> e)	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -900 to -1,400.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -2,600 to -5,200.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for reduction in GHG emissions associated with limited trucks operating in the same areas and designation of haul routes.</li> </ul>	<ul style="list-style-type: none"> <li>Significant potential to reduce GHG emissions. Assume &gt;1,000.</li> </ul>	<ul style="list-style-type: none"> <li>Significant potential to reduce GHG emissions. Assume &gt;1,000.</li> </ul>	<ul style="list-style-type: none"> <li>Significant potential to reduce GHG emissions. Assume &gt;1,000.</li> </ul>
County Capital Costs	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>No capital costs for County.</li> </ul>

	Bans on Commercial Food Waste	Multi-family Building Design Guidelines	Franchising Commercial Waste Collection	State Legislation	C&D Materials	Special Events
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Staffing and outreach costs for year 1 estimated at \$600,000, for year 2 at \$400,000 and for subsequent years at \$250,000.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$290,000 in year 1, \$240,000 in year 2 and \$212,500 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Cost for staff and outreach estimated at \$870,000 for year 1, \$670,000 for year 2 and \$520,000 for subsequent years. Potential for revenue from franchising fees (5-20%).</li> </ul>	<ul style="list-style-type: none"> <li>Minimal staff time for advocating to state.</li> </ul>	<ul style="list-style-type: none"> <li>Outreach and staffing costs estimated at \$312,500 for year 1, \$262,500 for year 2 and \$212,500 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Cost for staff and outreach estimated at \$870,000 for year 1, \$670,000 for year 2 and \$520,000 for subsequent years.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for economic growth and job creation through hauling and processing of food scraps.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some economic growth and job creation through waste collection.</li> <li>Large haulers may displace small haulers.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some benefit to local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for economic growth with increased diversion and requirement for recycling of materials.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> </ul>
<b>Process/ Infrastructure/ siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>Requires a facility with the processing capacity to take in the food waste.</li> </ul>	<ul style="list-style-type: none"> <li>Could increase amount of recycling collected.</li> <li>Would require a change to current ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>Requires comprehensive ordinance establishing districts, uniformity of services, designated facilities and legal recourse for defaults.</li> </ul>	<ul style="list-style-type: none"> <li>If EPR, bottle bill implemented, would have a significant impact on County facilities, including disposal and diversion.</li> <li>May require some changes to County ordinances if management of certain materials is no longer County responsibility.</li> </ul>	<ul style="list-style-type: none"> <li>Would require development of an ordinance that requires diversion of C&amp;D materials, which could include a financial incentive to recycle and show proof of diversion.</li> </ul>	<ul style="list-style-type: none"> <li>Requires the development of an ordinance.</li> <li>Organizers would have to develop a recycling plan - perhaps to get a permit, and show proof of recycling.</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>Requires ongoing education, outreach and enforcement.</li> </ul>	<ul style="list-style-type: none"> <li>Requires a higher level of effort to develop design standards, enforce requirements.</li> </ul>	<ul style="list-style-type: none"> <li>Requires a high level of effort to start and maintain a franchise system.</li> </ul>	<ul style="list-style-type: none"> <li>Requires considerable time for advocacy.</li> <li>County would need to consider how implementation would affect waste management programs and services.</li> </ul>	<ul style="list-style-type: none"> <li>May require a deposit in order to get permit.</li> <li>County would have to have infrastructure in place to manage deposits.</li> </ul>	<ul style="list-style-type: none"> <li>County would need to develop guidelines for organizers of special events and decide on level of support provided.</li> </ul>
<b>Availability of Facilities Vendors</b>	<ul style="list-style-type: none"> <li>Requires an organics processing facility.</li> <li>Currently there is limited processing capacity in the County and environs.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities/vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>There will be many companies interested in providing collection service.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities/vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities/vendors required by County.</li> <li>There are numerous C&amp;D recycling facilities in area.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities/vendors required.</li> </ul>

## 8.1 Recommendations on Regulatory Approaches

The following are recommendations on potential County and State regulatory options to increase diversion:

In the short-term (2020-2025):

- Develop an ordinance requiring the commercial sector to divert organics from disposal through donations, composting or other means.
- Revisit current ordinances to explore how they may be expanded to include more materials (e.g. single use packaging) or provide additional incentives to encourage reduction in use and/or diversion.
- Explore options to reduce single use plastic packaging in the County at the retail level, and through EPR policies.
- Undertake consultation with the commercial sector to identify the impact of adding more or modifying ordinances.
- Support or promote organizations or retail establishments that are actively working to reduce the use of the above types of materials on the County's website.
- Develop guidelines for waste management in multi-family buildings to ensure diversion is as convenient as disposal.

In the mid-term (2026-2030):

- Establish a County ordinance for diversion at special events.

In the long-term (2030+):

- Consider commercial franchising, and initiate stakeholder consultation process.
- Advocate at the State level for EPR.

## 9 Changes to How Materials are Collected

The following table presents an overview of options to collect waste in the County.

ES Table 7 Collection Options

	Standard Trash Container	Clear Bags	Reduced Frequency of Trash Collection	Bulky Waste Collection	Single Stream Recycling	Wet/Dry Collection
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>Provide a standard sized trash container (e.g. some multiple of 32 gallon per unit) to residents.</li> <li>Would only be possible with organics program in place.</li> </ul>	<ul style="list-style-type: none"> <li>Require trash to be placed out for collection in clear bags.</li> <li>Residents would place trash into clear bags which could be set out at the curb, placed into a standard garbage container or placed beside the standard garbage container as excess trash.</li> <li>Residents can set out as many clear bags as required as long as they do not contain any recyclables or organics.</li> </ul>	<ul style="list-style-type: none"> <li>Collect trash every other week (biweekly or every two weeks).</li> <li>Less frequent trash collection will increase participation in diversion programs.</li> <li>Would only be possible with organics program in place.</li> </ul>	<ul style="list-style-type: none"> <li>Reduce the number of bulk trash items set out for collection.</li> <li>Reduce the tons disposed at no charge at Shady Grove and Poolesville.</li> <li>Consider a per item fee in the future.</li> </ul>	<ul style="list-style-type: none"> <li>Implement a single-stream recycling program</li> <li>County switches from dual-stream to single-stream recycling collection.</li> <li>Potential for higher capture rates but also more contamination.</li> </ul>	<ul style="list-style-type: none"> <li>Implement a wet/dry collection program.</li> <li>“Wet” waste consisting of mainly organic materials (e.g. food waste, diapers, soiled paper etc.) are collected separately from “Dry” waste (e.g. recyclables, and other wastes).</li> <li>Could be considered for the commercial sector as materials streams are less contaminated compared to the residential sector and the wet and dry streams would be cleaner.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 17,000 – 28,300 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 1,100 - 1,700 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 17,000 to 30,000 tpy for reduced trash collection only.</li> <li>Potential to divert 12,000 to 21,000 tpy through alternating weeks of trash and recycling collection (i.e. biweekly collection).</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 5,400 to 10,900 tpy.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert 3,800 to 4,500 tons of recyclables annually from waste stream</li> </ul>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 20,400 to 34,000 tpy.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -20,800 to -35,300.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -1,400 to -2,000.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -16,400 to -27,400 for trash only.</li> <li>Net GHG emissions in the order of -14,100 to -25,100 for trash and recycling</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -15,700 to -31,400.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -8,900 to -9,300.</li> </ul>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -600 to -1,000.</li> </ul>

	Standard Trash Container	Clear Bags	Reduced Frequency of Trash Collection	Bulky Waste Collection	Single Stream Recycling	Wet/Dry Collection
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Capital costs associated with providing residents with a trash container (\$6 million for Sub-district A, \$14.2 million for Sub-districts A&amp;B), assuming provision of a 65 gallon container @ \$65.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs. Residents purchase bags.</li> </ul>	<ul style="list-style-type: none"> <li>Assuming residents have sufficient capacity in containers, no capital costs unless County provides a standard trash container.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs.</li> </ul>	<ul style="list-style-type: none"> <li>Capital costs associated with providing residents in Sub-districts A&amp;B with a second smaller cart (\$14.2 million @ \$65/cart) or with a larger 95 gallon cart (\$16.4 million @ \$75/cart).</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs to County as County does not provide collection or containers to commercial.</li> <li>Would require capital outlay by commercial sector.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Operating costs associated with storage, delivery, repair, maintenance, replacement of containers.</li> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$580,000 for year 2 and \$385,000 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$535,000 for year 2 and \$362,500 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Collection costs may be reduced with less frequent collection.</li> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$535,000 for year 2 and \$362,500 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Potential reduction in operational expenses.</li> <li>Staffing and outreach costs estimated at \$335,000 for year 1, \$240,000 for year 2 and \$140,000 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for operational savings, additional revenue with increased capture of recyclables and/or less revenue if more contamination, and potential for a reduction in \$/household.</li> <li>Operating costs associated with storage, delivery, repair, maintenance, replacement of containers.</li> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$580,000 for year 2 and \$430,000 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Majority of operating costs on the user.</li> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$580,000 for year 2 and \$430,000 for subsequent years.</li> </ul>
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> <li>Collection efficiencies are estimated to result in some collection staff positions reductions.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Minimal to no potential for job creation.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> <li>Could result in the loss of collection staff positions due to collection efficiencies.</li> </ul>	<ul style="list-style-type: none"> <li>Some potential for local economic growth if "wet" stream is processed locally.</li> <li>Potential for job creation if processing facility constructed or modified to process "wet" stream.</li> <li>Little change in number of collection staff.</li> </ul>

	Standard Trash Container	Clear Bags	Reduced Frequency of Trash Collection	Bulky Waste Collection	Single Stream Recycling	Wet/Dry Collection
<b>Process/ Infrastructure/ siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>• Anticipated to increase diversion which may impact MRF and possibly organics processing facility.</li> <li>• Would require a change to ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• No processing or infrastructure requirements.</li> <li>• Anticipated to increase diversion which may impact MRF and possibly organics processing facility.</li> <li>• No siting requirements.</li> <li>• Would require a change to ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>• No processing or infrastructure requirements.</li> <li>• Anticipated to increase diversion which may impact MRF and possibly organics processing facility.</li> <li>• No siting requirements.</li> <li>• Would require a change to ordinance.</li> <li>• Can only be implemented if SSO program in place</li> </ul>	<ul style="list-style-type: none"> <li>• No processing or infrastructure requirements.</li> <li>• Would have an impact on collection vehicles/routes, and potentially at Shady Grove.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires conversion of existing MRF to single stream</li> </ul>	<ul style="list-style-type: none"> <li>• Requires the development of a processing facility or procurement of merchant capacity for processing for wet stream.</li> <li>• Potential for impact on MRF if more contaminated materials need processing.</li> <li>• Would need organics processing facility capable of processing "wet" stream which may be more contaminated.</li> <li>• Infrastructure/permitting/ siting depends on if County owned facility is used to manage materials or if private capacity is procured.</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>• Would require an assessment of current setouts to identify suitably sized container, with consideration for a move to bi-weekly collection in future.</li> <li>• Would need to identify some mechanism for occasional overflow trash such as bag tags, amnesty days etc.</li> </ul>	<ul style="list-style-type: none"> <li>• Low level of effort for County as residents responsible for provision of bags.</li> <li>• Will require collection staff to inspect bags.</li> </ul>	<ul style="list-style-type: none"> <li>• Low level of effort for County to implement.</li> <li>• Would require significant education and outreach.</li> <li>• May require accommodation for those households with small children or medical issues.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires County to identify a typical tonnage of bulky waste dropped off to adjust "free" limits and to identify a reasonable number of bulk items set out for collection.</li> </ul>	<ul style="list-style-type: none"> <li>• High level of effort –</li> <li>• Requires conversion of existing MRF to single stream, procurement of new collection vehicles and collection containers, outreach and education and enforcement.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires a high level of effort to implement program.</li> <li>• If County responsible for processing, would require ability to manage "wet stream".</li> <li>• Requires a high degree of outreach, education and enforcement.</li> <li>• Would require significant consultation with stakeholders.</li> </ul>
<b>Availability of Facilities Vendors</b>	<ul style="list-style-type: none"> <li>• No facility required.</li> <li>• Multiple vendors of containers.</li> </ul>	<ul style="list-style-type: none"> <li>• No facility required.</li> <li>• Retailers would need to carry clear bags for purchase.</li> </ul>	<ul style="list-style-type: none"> <li>• No facility required.</li> </ul>	<ul style="list-style-type: none"> <li>• No facility required.</li> </ul>	<ul style="list-style-type: none"> <li>• Would require a single stream MRF.</li> <li>• The County does not have a single stream MRF.</li> </ul>	<ul style="list-style-type: none"> <li>• At this time, there is limited availability for a facility that can manage County's food scraps or a "wet" stream.</li> </ul>

## 9.1 Recommendations on How Materials are Collected

Decisions about how materials are collected are based on a number of factors, including cost, acceptability to the user, environmental impacts, and impacts on the County's infrastructure and can represent a major shift in programs and services.

The following are recommendations on relating to how materials are collected.

In the short term (2020-2025):

- Conduct one or more curbside waste audits over multiple seasons to measure the following:
  - setout of trash, recycling, yard waste and bulk waste
  - participation
  - fullness of trash and recycling containers
  - number of items per bulk trash collection
- Collect data at Shady Grove to monitor the quantity and composition of waste dropped off by residents to assist with modifying the “free” limit for disposal.
- Assess how changes to the bulk trash program may impact the County's current funding structure in terms of reducing the allowable limit for drop-off.
- Provide residents with a larger cart for commingled containers.
- As part of trash allowances and consideration of trash disincentives, consider restricting the number of containers of trash set out for collection, provision of a standard container, or PAYT (discussed in Section **Error! Reference source not found.**).
- Implement a restriction on the number of bulk items collected and reduce the 500 pound allowance disposal limit.
- Consider single stream recycling – the County has an existing dual stream recycling program which has good participation rates and results in relatively clean material. While there are efficiencies to be gained, it may not offset the impacts to processing of collected material. The County needs to consider the impacts of a move to single stream as it will be virtually impossible to switch back to dual stream recycling once residents have become accustomed to the new system. As the County is contemplating changes to its MRF, a single stream system could be considered as an option if the collection efficiencies gained offset the increases in capital and operating costs.

The following options are not recommended for further consideration:

- Wet/dry collection is not recommended at this time as the County does not currently provide any service to the non-residential sector, there is limited to no processing capacity to manage the wet stream, and it is a more complicated program for users. Should the County develop its own organics processing facility, the wet stream from the commercial sector may not be suitable for processing, depending on the technology chosen.
- Clear Bags are not recommended as a method of setting out materials at the curb at this time.

## 10 Operational Changes

The following table presents an overview of the options for operational changes that were considered to improve efficiencies and operation of various programs.

ES Table 8 Operational Changes

	Collection in Sub-districts A&B	Yard Waste Collection	Mobile Collection of Certain Materials	Removal of Glass from Curbside Collection
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>County would expand trash collection to Sub-district B.</li> <li>County would provide same services to all residents in Sub-districts A&amp;B.</li> </ul>	<ul style="list-style-type: none"> <li>Eliminate leaf vacuuming service.</li> <li>Reduce level of service of curbside yard trim collection to only provide seasonal collection rather than year-round collection.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake collection of HHW and/or electronics with a truck/trailer to provide more convenient drop-off options to residents.</li> </ul>	<ul style="list-style-type: none"> <li>Cease acceptance of glass in curbside recycling program.</li> <li>Provide bins for separate collection of glass for residents to drop off glass containers.</li> <li>Glass could be separated by color to facilitate recycling.</li> </ul>
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert 2,700 to 4,000 tons of recyclables annually from waste stream.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for little to no tons to be diverted from disposal with eliminating of leaf vacuuming service as leaves will be collected through curbside program.</li> <li>Some leaves may be diverted to backyard composting.</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to estimate diversion potential.</li> <li>Likely some increase in tons of HHW and electronics, although tonnage may shift from Shady Grove.</li> </ul>	<ul style="list-style-type: none"> <li>Difficult to estimate diversion potential.</li> <li>May reduce the amount of glass collected but may increase recovery due to less breakage and source separation.</li> </ul>
<b>Net GHG potential (MTCO<sub>2e</sub>)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of -6,300 to -9,500.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for reduction in GHGs with fewer trucks providing collection service throughout the year, and no leaf vacuuming service.</li> </ul>	<ul style="list-style-type: none"> <li>Some potential to reduce GHGs associated with diversion of additional materials from disposal.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal potential for reduction in GHGs with diversion from disposal.</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Minimal to no capital costs to County.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs to County.</li> </ul>	<ul style="list-style-type: none"> <li>Capital expense associated with purchase of trailer for collection of HHW and electronics.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some capital costs associated with provision of depots for glass.</li> </ul>
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Higher collection costs for providing more service to more residents in the order of \$8.8 million.</li> <li>Staffing and outreach costs estimated at \$780,000 in year 1, \$580,000 in year 2 and \$430,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Operational savings in reducing the number of yard waste collections and eliminating leaf vacuuming service.</li> <li>Staffing and outreach costs estimated at \$780,000 in year 1, \$580,000 in year 2 and \$430,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Potential operating costs associated with mobile trailer and management of additional quantities of electronics and HHW.</li> <li>Staffing and outreach costs estimated at \$780,000 in year 1, \$580,000 in year 2 and \$430,000 in subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Potential reduction in operational expenses associated with impact of broken glass at MRF.</li> <li>Some operating expenses associated with collecting glass from bins/depots and sorting.</li> <li>Staffing and outreach costs estimated at \$780,000 in year 1, \$580,000 in year 2 and \$430,000 in subsequent years.</li> </ul>

	Collection in Sub-districts A&B	Yard Waste Collection	Mobile Collection of Certain Materials	Removal of Glass from Curbside Collection
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> <li>• Potential that small haulers may be displaced by larger haulers in Sub-district B.</li> <li>• Potential for reductions in collection staff due to collection efficiencies.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>• Potential for minimal to no local economic growth.</li> </ul>
<b>Process/ Infrastructure/siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>• No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>• May require permitting for mobile collection of HHW.</li> <li>• Would require a trailer suitable for managing these materials.</li> <li>• Would need to locate areas where trailer may be placed during collection events.</li> </ul>	<ul style="list-style-type: none"> <li>• Would require sourcing of bins (FEL or other) and placement in convenient locations (e.g. shopping mall).</li> </ul>
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>• Requires County to identify operational changes and impact on financing.</li> <li>• Would need to procure collection contractor for Sub-district B.</li> </ul>	<ul style="list-style-type: none"> <li>• Requires County to undertake a data collection exercise to identify yard waste set outs in winter months to optimize seasonal collection days.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify areas where HHW and electronics collection can take place. County would need to research a suitable trailer, which may require a license/permit.</li> <li>• Have staff/equipment available to wrap and load pallets of electronics onto trailer</li> </ul>	<ul style="list-style-type: none"> <li>• Identify areas where glass collection can take place.</li> <li>• Source containers and place them as permitted.</li> </ul>
<b>Availability of Facilities Vendors</b>	<ul style="list-style-type: none"> <li>• Likely to be many vendors who could undertake collection in Sub-district B.</li> </ul>	<ul style="list-style-type: none"> <li>• No vendors/facilities required.</li> </ul>	<ul style="list-style-type: none"> <li>• There are many types of mobile collection trailers available.</li> </ul>	<ul style="list-style-type: none"> <li>• There are many types of collection bins available.</li> </ul>

## 10.1 Recommendations on Operational Changes

There are many options the County can consider in materials collection and management that will increase efficiencies, encourage diversion and improve operations.

The following are recommendations for operational changes in the short term (2020-2025):

- Evaluate if glass should be removed from the curbside program and managed separately. The timing of this may vary depending on the County's plans for modifications to the MRF particularly if Single Stream recycling is carried forward. This may be a consideration for a new or modified MRF, or a recycling/drop-off depot.
- Conduct a business case to evaluate if the County should provide all collection services to Sub-districts A&B and potentially the incorporated cities/municipalities. This will provide collection efficiencies and is critical to implementing a curbside organics collection program.
- Eliminate the leaf vacuuming service
- Reduce the level of yard waste collection based on the outcome of the curbside waste audit (as discussed in the previous section).

For the mid-term (2026-2030):

- If the County does not implement additional recycling drop-off depots or a resource recovery park, consider mobile collection of materials such as HHW and electronics.

## 11 Supporting Initiatives

The following table presents an overview of other initiatives to support diversion of materials.

ES Table 9 Supporting Initiatives

	Full PAYT	Partial PAYT	Incentives	Administrative Efficiencies	Anti-litter	Performance Metrics	Inter-municipal Partnerships	Green Procurement	Education & Enforcement
<b>Description of Option</b>	<ul style="list-style-type: none"> <li>• Residents pay for all trash set out for collection.</li> <li>• Can use specially marked bags, bag tags or variable sized collection containers.</li> </ul>	<ul style="list-style-type: none"> <li>• Residents pay additional fees beyond a “free” container.</li> <li>• Typically use either specially marked bags or bag tags.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide grants or incentives to residents or businesses to encourage diversion through recycling or composting.</li> </ul>	<ul style="list-style-type: none"> <li>• Reduce the number of contractors that provide services to different service areas</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage more recycling/trash containers in public spaces that are signed well and have visual cues to divert more materials from disposal.</li> </ul>	<ul style="list-style-type: none"> <li>• Consider revising County’s waste diversion goal or adopting additional performance metrics to accurately represent waste diverted.</li> <li>• Consider use of per capita trash disposal rate or per capita waste generation rate to monitor progress towards zero waste more accurately.</li> </ul>	<ul style="list-style-type: none"> <li>• Develop or join inter-municipal partnerships to facilitate knowledge sharing, explore joint procurement opportunities, consider harmonizing programs so that residents who work/play and live in the area all have access to similar programs, and explore opportunities for developing market development.</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage market development of certain materials.</li> <li>• Work cooperatively with municipalities and organizations to encourage the market development of certain materials that would encourage recycling of targeted products with a focus on a circular economy.</li> </ul>	<ul style="list-style-type: none"> <li>• Provide education and outreach and enforcement.</li> <li>• Utilize more workers in the Recycling Investigations Unit.</li> <li>• Enforce recycling through citations for single-family homes.</li> <li>• Develop policies to deal with trucks arriving at the MRF with contaminated material.</li> <li>• Promote waste reduction in schools.</li> <li>• Develop a mobile app.</li> <li>• Develop targeted campaigns.</li> </ul>

	Full PAYT	Partial PAYT	Incentives	Administrative Efficiencies	Anti-litter	Performance Metrics	Inter-municipal Partnerships	Green Procurement	Education & Enforcement
<b>Waste diversion potential</b>	<ul style="list-style-type: none"> <li>Potential to divert an estimated 17,000 - 30,000 tpy.</li> </ul>		<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> <li>Anticipate high rates of contamination which will lower diversion.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have a positive impact on diversion, but difficult to estimate tons diverted.</li> </ul>
<b>Net GHG potential (MTCO<sub>2</sub>e)</b>	<ul style="list-style-type: none"> <li>Net GHG emissions in order of - 20,800 to - 35,300.</li> </ul>		<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>	<ul style="list-style-type: none"> <li>Supporting mechanisms will have an impact on reducing GHGs.</li> <li>Assume minimal impact.</li> </ul>
<b>County Capital Costs</b>	<ul style="list-style-type: none"> <li>Potential for significant capital costs associated with providing residents with one or more collection containers.</li> </ul>		<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some capital costs associated with providing containers (but may be incurred by other departments).</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal to no capital costs for County.</li> </ul>

	Full PAYT	Partial PAYT	Incentives	Administrative Efficiencies	Anti-litter	Performance Metrics	Inter-municipal Partnerships	Green Procurement	Education & Enforcement
<b>County Operating Costs</b>	<ul style="list-style-type: none"> <li>Annual operating costs associated with storage, delivery, repair, maintenance, replacement of containers if provided.</li> <li>Bag/Bag tag program would have lower operating costs.</li> <li>Staff time required to set up a program to manage customer requests and billing.</li> <li>Staffing and outreach costs estimated at \$780,000 for year 1, \$580,000 for year 2 and \$385,000 for subsequent years.</li> </ul>	<ul style="list-style-type: none"> <li>Some staff time (.25 FTE) required for managing grant applications and sourcing funding.</li> </ul>	<ul style="list-style-type: none"> <li>Could reduce contract administration time.</li> </ul>	<ul style="list-style-type: none"> <li>Operating costs associated with the collection and maintenance of the additional trash and recycling bins.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal staff time required to develop new performance metrics.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal staff time required to attend meetings.</li> </ul>	<ul style="list-style-type: none"> <li>Minimal staff time required to investigate green procurement opportunities.</li> </ul>	<ul style="list-style-type: none"> <li>Ongoing annual costs related to enhanced enforcement and workers to provide educational and outreach efforts.</li> <li>No new costs (additional FTE are included in cost estimates for each option).</li> </ul>	
<b>Potential for Local Economic Growth</b>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some local economic growth from monetary incentives.</li> </ul>	<ul style="list-style-type: none"> <li>Potential to reduce jobs.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for minimal to no local economic growth.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for economic growth if new markets are developed.</li> </ul>	<ul style="list-style-type: none"> <li>Potential for some job creation for outreach and education efforts.</li> </ul>	
<b>Process/ Infrastructure/ siting/ permitting considerations</b>	<ul style="list-style-type: none"> <li>Anticipated to increase diversion which may impact MRF and possibly organics processing facility.</li> <li>Would require a change to ordinance.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	<ul style="list-style-type: none"> <li>No processing or infrastructure requirements.</li> </ul>	

	Full PAYT	Partial PAYT	Incentives	Administrative Efficiencies	Anti-litter	Performance Metrics	Inter-municipal Partnerships	Green Procurement	Education & Enforcement
<b>Level of effort/ Implementation considerations</b>	<ul style="list-style-type: none"> <li>If program is container based - may require County to set up a system to allow residents to choose a size of container, along with a system for exchanges, billing etc. container delivery and maintenance and ongoing staff time for billing and resident calls.</li> <li>Bag/Bag-tag programs will require supplies stocked in retail outlets.</li> <li>May require agreement with private company to implement program.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing education and outreach and funding for grants.</li> </ul>	<ul style="list-style-type: none"> <li>May require realignment of service areas and number of service providers in each area.</li> <li>Would require renegotiation or issuance of collection contracts.</li> </ul>	<ul style="list-style-type: none"> <li>Would require the County to identify potential locations to increase availability of recycling/trash containers.</li> <li>Would require DEP to work with other departments to increase number of containers in public spaces.</li> </ul>	<ul style="list-style-type: none"> <li>Low level of effort.</li> <li>Requires policy decision on how success and progress is measured.</li> </ul>	<ul style="list-style-type: none"> <li>Low level of effort.</li> <li>Requires participation and attendance at meetings, or development of committees/councils/working groups to develop local solutions.</li> </ul>	<ul style="list-style-type: none"> <li>Low level of effort.</li> <li>Requires research and investigation of current market conditions.</li> <li>Some consultation with stakeholders.</li> </ul>	<ul style="list-style-type: none"> <li>Requires ongoing implementation of education, outreach and enforcement to ensure County's programs and services are advertised and used appropriately.</li> </ul>	
<b>Availability of Facilities Vendors</b>	<ul style="list-style-type: none"> <li>There are many vendors who can support a PAYT system.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>Many vendors of trash/recycling containers.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	<ul style="list-style-type: none"> <li>No facilities or vendors required.</li> </ul>	

## 11.1 Recommendations on Supporting Initiatives

The following are recommendations on supporting initiatives:

In the short-term (2020-2025);

- Conduct research or develop a business case to determine the impact of full or partial PAYT on the solid waste enterprise fund.
- Consider a hybrid PAYT program which could consist of a standard trash container coupled with tags or bags for excess trash. Alternatively, the County could move to a full or partial PAYT program using tags or bags.
- Investigate incentives to encourage innovation in sustainable materials management and contributions towards a circular economy.
- Investigate grants or incentives to encourage food scraps diversion for the non-residential sector.
- Consider additional performance metrics such as a per capita waste generation rate or a per capita disposal rate to monitor progress towards zero waste.
- Consider revising the 70% diversion by 2020 goal.

In the short to mid-term (2020-2030):

- The County should consider realignment of service areas and reducing the number of collection contracts.

- Continue to monitor opportunities for green procurement.
- Develop or join inter-municipal partnerships to share knowledge and explore opportunities to work together.

The following options are not recommended:

- Full cart-based PAYT – this is a complex system requiring considerable capital investment and operating expenses to implement and maintain. It is unlikely this system would result in significant changes to the County’s recycling rate as compared to a less complex system such as a hybrid PAYT program or a standard trash container.
- Incentives for participation in recycling programs – these programs are expensive and have not been proven to increase recycling in the long-term.
- Oversight/placement of anti-litter/more recycling and trash containers in public places – since DEP is not responsible for collection of these containers, there is no direct benefit to DEP to take on more responsibility of containers that have potentially high levels of contamination.

## 11.2 Recommendations for Education and Enforcement

Education and enforcement are critical to the successful implementation of any option the County chooses to pursue. Many of the options will require a targeted campaign developed in conjunction implementation with continued education and outreach post implementation. Some options will have an enforcement component required to ensure compliance.

Depending on the options carried forward for implementation, there will be varying degrees of outreach, promotion and education required by County staff. All of the options discussed above that will lead to increased diversion will require additional educational efforts above what is currently being conducted. Additional staffing for these efforts will be needed. Some of the additional staffing need may be reduced depending on the timing of implementation of the programs.

Based on the outcome of the survey, it is evident that residents desire more education about how to recycle properly. Recycling programs, and acceptable materials vary depending on where people live, work and play. On an on-going basis, the County should explore campaigns that target certain materials and explore various media and outreach tactics. The County could work with organizations such as the Recycling Partnership to develop targeted campaigns.

The following are options that could be implemented in the short to mid-term:

- Review the layout of DEP’s website to ensure information is easily found, accessible and optimized for viewing on mobile phones.
- Support the development of an app to provide further information on County waste management programs, and as well, opportunities/locations to reuse or recycle materials.
- Conduct additional outreach at schools and through specialized programs such as Master Composter courses. The County could also consider additional outreach targeting food waste reduction, perhaps in conjunction with a food waste reduction campaign, but also to teach people what to do with donated food (particularly perishables) to reduce waste. This could be done through communal kitchens, courses or workshops kitchen or food literacy, and instruction on basic cooking skills.

- Continue to document the number of enforcement activities (e.g. fines, oops stickers) as a measure of the effectiveness of education, outreach and enforcement activities.
- Conduct waste audits to monitor the effectiveness of education and outreach, particularly if there are targeted campaigns.

## 12 Estimates of Tons Diverted

Table 10 presents the estimated tons diverted with the various options considered as well as on a per household basis.

ES Table 10 Estimates of Tons of Materials Diverted

Option	Estimated Annual Tons Diverted/Reduced		Change in Waste Quantities or Management (pounds per hh/unit per year)		Assumption
	Low	High	Low	High	
<b>Waste Reduction and Reuse</b>					
<b>Reduction of Wasted Food</b>	2,200	2,800	12	15	Quantities of food waste* disposed reduced by 4-5% from SF/MF hh
<b>Fix-It/Repair Clinics</b>	20	60	0.1	0.3	Reduction of .1 to .3 lbs per SF/MF hh
<b>Reuse Centers</b>	1,300	4,000	7	21	Reduction of 1-3% of SF/MF disposed (*ferrous, plastic, textiles, leather, carpets, wood, electronics, glass etc.)
<b>Opportunities for Materials Exchange</b>	20	60	0.1	0.3	Reduction of .1 to .3 lbs per SF/MF hh and NR unit
<b>Support Reuse Events</b>	20	60	0.1	0.3	Reduction of .1 to .3 lbs per SF/MF hh
<b>Sharing Libraries</b>	20	60	0.1	0.3	Reduction of .1 to .3 lbs per SF/MF hh
<b>Recycling Additional Materials</b>					
<b>Mattress Recycling</b>	200	700	1	3	Capture rates 10-30% for recycling
<b>Carpet Recycling</b>	2,100	3,100	10	15	Carpet consists of 30% of textiles/leather/carpet* category, 40-50% capture for SF, (curbside collection), 20-30% capture for MF, NR (depot collection) for recycling
<b>Textile Collection and Recycling</b>	4,000	5,000	21	26	Textiles consists of 60% of textiles/leather/carpet* category, 50-60% capture for SF (curbside collection), 20-30% capture for MF, NR (depot collection) for recycling
<b>Porcelain and Ceramic Recycling</b>	20	70	0.1	0.3	Based on estimates of toilets and sinks potentially generated in County, capture 10-40% from SF, MF, NR for recycling

Option	Estimated Annual Tons Diverted/Reduced		Change in Waste Quantities or Management (pounds per hh/unit per year)		Assumption
	Low	High	Low	High	
<b>Diversion of Food Scraps and Other Organics</b>					
<b>Organics Curbside Collection and Processing</b>	10,400	17,600	50	80	Diversion of Food Scraps and Non-recyclable paper* Disposed - Capture - SF - 30-50% of food scraps and 5-10% non-recyclable paper, Sub-district A&B only
<b>Community Recycling/Composting Facility</b>	20	60	0.1	0.3	5 facilities, divert .4 - 1 ton per site monthly for composting
<b>In-Sink Disposal Units</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Backyard Composting</b>	600	1,400	4	11	220 lbs/composter/year diverted. Assume 2-5% of SF hh will participate in composting
<b>On-Farm Composting</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>C&amp;D Materials Diversion</b>					
<b>C&amp;D Materials Recycling</b>	26,000	130,000	0.1	0.3	Low tech facility processes 100 tons per day, higher tech facility processes 500 tons per day. Assume generated by SF, MF and NR. For recycling
<b>Recovery Park &amp; Drop-off Depots</b>					
<b>Resource Recovery Park</b>	-	-	-	-	Reduction/recovery potential depends on type of facilities located within park and materials managed.
<b>Recycling/Drop-off Depots</b>	-	-	-	-	Reduction/recovery potential depends on materials managed and whether materials are dropped off for disposal or diversion. Potential for some tons currently managed at Shady Grove to be managed at drop-off depots instead.
<b>Regulatory</b>					
<b>Commercial Food Waste Ban</b>	31,200	46,800	1,800	2,700	Assumes 40-60% capture of food waste from the commercial sector.
<b>Bans on Shopping Bags and Increased Fee for Paper Bags</b>	500	1,000	3	5	Reduction of shopping bags* disposed, 40-60% capture rate
<b>Reduce EPS Products</b>	30	40	0.1	0.2	Reduction of EPS, 40-60% capture, estimated at 0.1% of residential waste generated

Option	Estimated Annual Tons Diverted/Reduced		Change in Waste Quantities or Management (pounds per hh/unit per year)		Assumption
	Low	High	Low	High	
<b>Reduce Single-use Plastic Water Bottles</b>	400	900	2	5	Assumes 10-20% capture of narrow neck containers,* consists of PET, assume 50% source reduced and 50% recycled
<b>Reduce Single-use Food Ware</b>	600	900	3	4	40-60% capture of tubs/lids, assumes 25% single use - source reduction
<b>Reduce Single-use Plastic Film Packaging</b>	100	400	0.5	1.9	5-10% capture of 10-20% other film plastic - 100% source reduction
<b>Multi-Family Design Standards</b>	1,100	2,200	17	34	Capture of an additional 5-10% recyclables
<b>Commercial Franchising</b>	-	-	-	-	Potential for additional recovery of recyclables and food scraps depending on regulation.
<b>Legislation for EPR of Other Materials</b>	-	-	-	-	Reduction potential depends on the materials under regulation.
<b>Container Deposit Legislation</b>	-	-	-	-	Reduction potential depends on the types of containers that are regulated.
<b>C&amp;D Materials Ordinance</b>	-	-	-	-	Reduction potential depends on the materials under regulation.
<b>Changes to How Materials are Collected</b>					
<b>Standard Trash Container</b>	17,400	29,500	90	150	10-17% reduction in trash, increase in quantities of recycling and food scraps captured, source reduction from SF hh
<b>Clear Bags</b>	1,100	1,700	9	13	Reduction in trash of .2 -.3 lbs/week/SF hh (increase in recycling and composting)
<b>Bi-Weekly Trash Collection</b>	13,700	22,900	110	180	Increase in food scrap diversion (20 to 40%). Increase in SF recycling (10 to 15%).
<b>Reduce Bulky Trash Collection</b>	12,000	21,000	100	200	Increase in SF recycling (5-10%) and food scraps (20-40%)
<b>Single Stream</b>	5,400	10,900	28	56	Reduce allowance of bulk trash set out or dropped off at TS; Reduction of 28-56 lbs of trash per hh through recycling or reuse
<b>Wet/dry</b>	3,800	4,500	18	22	Increase in recycling (*paper, glass, narrow-neck plastics, metal containers, aluminum cans/pans/foil, plastic tubs/lids) from 10-12% from all sectors
<b>Operational Changes</b>					

Option	Estimated Annual Tons Diverted/Reduced		Change in Waste Quantities or Management (pounds per hh/unit per year)		Assumption
	Low	High	Low	High	
<b>Trash collection expanded to Sub-district B</b>	2,700	4,000	43	64	Increase in recycling from SF hh in Sub-district B (10-15%)
<b>Change in Collection Methods - Leaves &amp; Yard Trim</b>	-	-	-	-	Unlikely to result in a change in tonnage.
<b>Mobile Collection of Divertible Materials</b>	-	-	-	-	Difficult to estimate diversion potential. Likely some increase in tons of HHW and electronics, although tonnage may shift from Shady Grove.
<b>Curbside Glass Handling</b>	-	-	-	-	Difficult to estimate diversion potential.
<b>Other Supporting Initiatives</b>					
<b>PAYT</b>	17,400	29,500	90	150	10-17% reduction in trash, increase in quantities of recycling and food scraps captured, source reduction from SF hh
<b>Sustainable materials management</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Incentives</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Administrative Efficiencies</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Anti-litter/More Recycling/Trash Containers in Public Places</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Special Events Recycling Requirements</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Performance Metrics</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Inter-municipal Partnerships</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Green Procurement</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Education and Enforcement</b>					
<b>Enhancement of Existing Investigation and Enforcement</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Increased Education</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.

Option	Estimated Annual Tons Diverted/Reduced		Change in Waste Quantities or Management (pounds per hh/unit per year)		Assumption
	Low	High	Low	High	
<b>Promoting Waste Reduction in Schools</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.
<b>Mobile App</b>	-	-	-	-	Supporting mechanism, difficult to estimate impact on diversion or reduction.

Table 11 presents a summary of the estimated tons diverted for the recommended options.

ES Table 11 Summary of Potential Annual Tons Diverted from Recommended Options

Category/Option	Options included	Tons (Low Range)	Tons (High Range)
Waste Reduction and Reuse	All options	3,580	7,040
Recycling Additional Materials	Mattress, Carpets, Textile	6,300	8,800
Diversion of Food Scraps and Other Organics	SF Residential (Sub-districts A&B)	10,400	17,600
Other Supporting Organics Initiatives	Community, Backyard Composting	620	1,460
Recovery Park & Drop-off Depots	TBD	0	0
Regulatory	Commercial Food Waste Ban	31,200	46,800
	Reductions/Bans on other materials (excluding EPS)	2,700	5,400
Changes to How Materials are Collected	Standard Trash Container, Biweekly trash, Reduce Bulky	35,700	61,900
Operational Changes	Expand Trash Collection to Sub-District B	2,700	4,000
Education and Enforcement		0	0
Total		93,200	153,000
C&D Materials Diversion		26,000	130,000
Total with C&D Diversion		119,200	283,000

## 13 Impact on Recycling Rate

Table 12 below presents the current tons generated and recycled in the County (2017). Table 13 presents a breakdown of the recycling rates by Generator and the County's overall Diversion Rate (2017).

ES Table 12 Recycling and Diversion Rates for Montgomery County (CY 2017)

Generated Materials By Category		Tons
	Total Waste Generated in the County (Residential, Commercial, C&D)	1,378,396
<b>A</b>	C&D Waste (Recycled, Landfilled, Burned)	275,345
<b>B</b>	Residential & Commercial Waste Recycling (counts toward recycling rate)	369,125
<b>C</b>	Residential & Commercial Yard Trim (counts toward recycling rate)	84,489
<b>D</b>	Residential & Commercial MSW Disposed (Burned, Landfilled)	649,437
<b>E</b>	Total Residential and Commercial Waste Generated (not including C&D)	1,103,051
Recovered Materials By Category		Tons
<b>F</b>	Metal Recovered from RRF attributed to Residential/Commercial (counts toward recycling)	7,039
<b>G</b>	Metal Recovered from RRF attributed to C&D (does not count toward recycling rate)	1,023
<b>H</b>	Ash Recycled from RRF attributed to Residential/Commercial (counts toward recycling rate)	156,080
<b>I</b>	Ash Recycled from RRF attributed to C&D (does not count toward recycling rate)	22,676
<b>J</b>	Total Recycled (Recycling, Yard Trim, Metal, Ash) (B+C+F+H)	616,733
<b>K</b>	Total Generated (E)	1,103,051
<b>L</b>	Recycling Rate (J/K)	55.91%

Source: Montgomery County, MD Department of Environmental Protection. Division of Solid Waste Services, September 2018

ES Table 13 Tons of Materials Generated in Montgomery County (CY 2017)

Recycling and Diversion Rates (2017)	
Single-Family Recycle Rate	62.58%
Multi-Family Recycle Rate	28.70%
Non-Residential Recycle Rate	55.82%
Overall County Recycle Rate	55.91%
Overall County Diversion Rate (including 5% Source Reduction credit)	60.91%

Table 14 below shows the impact of the recommended options on the County’s recycling rate. With continued use of the RRF, it may be possible to achieve 70% diversion, assuming ash and metals recovered from the RRF still contributes to the recycling rate. Without the RRF, it will be very difficult for the County to achieve 70% diversion.

ES Table 14 Estimated Diversion Rate Scenarios

	Low Range	High Range
<b>Status Quo</b>	Tons (Status Quo -2017)	
Status Quo Diverted - Recycling, Yard Trim, Recovered Metal, Ash	616,733	
Total Generated	1,103,051	
Recycling Rate	56%	
<b>With RRF</b>		
Status Quo Diverted - Recycling, Yard Trim, Recovered Metal, Ash	616,733	616,733
Additional Diversion not Including C&D	93,200	153,000
Total Generated	1,103,051	1,103,051
Recycling Rate	64%	70%
<b>With No RRF</b>		
Diversion - Recycling and Yard Trim only	453,614	453,614
Additional Diversion not Including C&D	93,200	153,000
Total Generated	1,103,051	1,103,051
Recycling Rate	50%	55%

## 14 Estimates of Net GHG Emissions

The following table presents estimates of the changes in GHG emissions associated with diverting more materials, or source reduction. The US EPA WARM model (v14) was used to develop these estimates. The table presents the change in emissions compared to combustion (i.e. use of the RRF) and landfill. In all cases, there are GHG reductions where estimates for tons diverted/reduced could be made.

ES Table 15 Estimates of Net GHG emissions (MTCO<sub>2</sub>e)

	Estimated Annual Tons Diverted/ Reduced		Incremental change in GHG emissions (compared to combustion) (MTCO <sub>2</sub> e)		Incremental change in GHG emissions (compared to landfill) (MTCO <sub>2</sub> e)		WARM category used for modelling	Notes
	Low	High	Low	High	Low	High		
<b>Waste Reduction and Reuse</b>								
Reduction of Wasted Food	2,200	2,800	-7,900	-9,900	-9,000	-11,300	Food Waste	Source Reduced
Fix-It/Repair Clinics	20	60	-1,000	-2,900	-1,000	-2,900	Personal Computers	Source Reduced
Reuse Centers	1,300	4,000	-3,800	-11,400	-3,700	-11,200	Mixed Metals, Mixed Plastics (50% each)	Source Reduced
Opportunities for Materials Exchange	20	60	-1,100	-3,200	-1,100	-3,200	Personal Computers	Source Reduced
Support Reuse Events	20	60	-1,000	-2,900	-1,000	-2,900	Personal Computers	Source Reduced
Sharing Libraries	20	60	-1,000	-2,900	-1,000	-2,900	Personal Computers	Source Reduced
<b>Recycling Additional Materials</b>								
Mattress Recycling	200	700	-300	-1,000	-300	-1,000	30% each steel cans, dim lumber, carpet	Recycled
Carpet Recycling	2,100	3,100	-7,100	-10,700	-4,900	-7,500	Carpet	Recycled
Textile Collection and Recycling	4,000	5,000	-13,800	-17,200	-9,600	-12,000	Carpet	Recycled
Porcelain and Ceramic Recycling	20	70	-1	-2	-1	-2	Concrete	Recycled

	Estimated Annual Tons Diverted/ Reduced		Incremental change in GHG emissions (compared to combustion) (MTCO <sub>2</sub> e)		Incremental change in GHG emissions (compared to landfill) (MTCO <sub>2</sub> e)		WARM category used for modelling	Notes
<b>Diversion of Food Scraps and Other Organics</b>								
Organics Curbside Collection and Processing	10,400	17,600	-300	-500	-5,500	-9,300	Food Waste	Composted
Community Recycling/Composting Facility	20	60	-1	-2	-10	-30	Food Waste	Composted
Backyard Composting	600	1,400	-20	-40	-300	-700	Food Waste	Composted
<b>C&amp;D Materials Diversion</b>								
C&D Materials Recycling	26,000	130,000	-18,300	-91,300	-22,500	-112,600	60% concrete, 10% ferrous metal, 15% OCC, 15% dim lumber	Recycled
<b>Regulatory</b>								
Commercial Food Waste Ban	31,200	46,800	-900	-1,400	-16,500	-24,800	Food Waste	Composted
Bans on Plastic Shopping Bags and Increased Fee for Paper Bags	500	1,000	-1,500	-2,900	-900	-1,800	100% LDPE	Source Reduced
Reduce EPS Products	30	40	-100	-200	-100	-100	100% PS	Source Reduced
Reduce Single-use Plastic Water Bottles	400	900	-1,200	-2,000	-700	-1,500	100% PET	50% source reduced, 50% recycled
Reduce Single-use Food Ware	600	900	-1,500	-2,300	-900	-1,300	100 PP%	Source Reduced
Reduce Single-use Plastic Film Packaging	100	400	-300	-1,100	-200	-700	100% LDPE	Source Reduced
Multi-Family Design Standards	1,100	2,200	-2,600	-5,200	-2,800	-5,700	Mixed Recyclables	Recycled
<b>Changes to How Materials are Collected</b>								
Standard Trash Container	17,400	29,500	-20,800	-35,300	-27,000	-45,800	50% each mixed recyclables and food waste	Recycled & Composted

	Estimated Annual Tons Diverted/ Reduced		Incremental change in GHG emissions (compared to combustion) (MTCO <sub>2</sub> e)		Incremental change in GHG emissions (compared to landfill) (MTCO <sub>2</sub> e)		WARM category used for modelling	Notes
Clear Bags	1,100	1,700	-1,400	-2,000	-1,800	-2,600	50% each mixed recyclables and food waste	Recycled & Composted
Bi-Weekly Trash Collection	13,700	22,900	-16,400	-27,400	-21,200	-35,500	50% each mixed recyclables and food waste	Recycled & Composted
Bi-Weekly Trash and Recycling Collection	12,000	21,000	-14,100	-25,100	-18,300	-32,600	50% each mixed recyclables and food waste	Recycled & Composted
Reduce Bulky Trash Collection	5,400	10,900	-15,700	-31,400	-15,400	-30,800	Mixed metals, mixed plastics - 50% each	Source Reduced
Single Stream	3,800	4,500	-8,900	-9,300	-9,700	-12,900	Mixed Recyclables	Recycled
Wet/dry	20,400	34,000	-600	-1,000	-10,800	-18,000	Food Waste	Composted
<b>Operational Changes</b>								
Trash collection expanded to Sub-district B	2,700	4,000	-6,300	-9,500	-6,900	-10,300	Mixed Recyclables	Recycled
<b>Other Supporting Initiatives</b>								
PAYT	17,400	29,500	-20,800	-35,300	-27,000	-45,800	Mixed Recyclables, Food Waste	30% Recycled, 30% composted, 30% source reduced

## 15 Estimates of Costs

Estimates of costs for the options were developed with information provided by the County (for staffing – outreach and enforcement, as well as outreach and education materials) and based on HDR professional experience, as well as publicly available information. The following table presents costs for options where estimates were able to be developed.

ES Table 16 Summary of Estimated Costs

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
<b>Waste Reduction and Reuse</b>								
Reduction of Wasted Food	\$245,000	\$195,000	\$85,000		\$40,000			County develops and implements a food waste reduction strategy.
Fix-It/Repair Clinics	\$122,500	\$92,500	\$62,500		\$5,200			Clinics hosted in existing facility, 1 clinic held every 2 weeks in locations around County, manned by volunteers, County oversight.
Reuse Centers	\$122,500	\$92,500	\$62,500					One facility located at Recycling/Drop-off Center. Capital costs included in that option.
Opportunities for Materials Exchange	\$122,500	\$92,500	\$62,500					County provides support for community/neighborhood exchanges, and establishes an on-line portal.
Support Reuse Events	\$122,500	\$92,500	\$62,500					County support for reuse events through P&E only.
Sharing Libraries	\$122,500	\$92,500	\$62,500		\$10,000			Libraries located in existing County facilities.
<b>Recycling Additional Materials</b>								
Mattress Recycling	\$245,000	\$172,500	\$122,500		\$135,000 - \$390,000			Mattresses collected at TS and hauled to facility in Baltimore. Operating costs include storage, hauling and processing @\$20/mattress.
Carpet Recycling	\$245,000	\$172,500	\$122,500		\$40,000 - \$70,000			Carpets collected at TS and hauled to facility for recycling. Operating costs include storage, hauling and processing @\$20/ton.

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
Textile Collection and Recycling	\$245,000	\$172,500	\$122,500				\$80,000 - \$100,000	Private company undertakes collection and processing.
Porcelain and Ceramic Recycling	\$245,000	\$172,500	\$122,500		\$2,000			Material collected in roll-off bin at TS.
<b>Diversion of Food Scraps and Other Organics</b>								
Organics Curbside Collection and Processing								
<b>COLLECTION</b>								
Pilot Program	\$290,000	\$240,000		\$30,000	\$22,000	\$50,000		(2 year pilot for 8,000 homes - 5 routes, 1600 homes each). Carts amortized over 10 years. Collection costs based on \$2.78/hhld (MSW collection modeling). Implementation costs include audits.
Full-scale Program	\$870,000	\$580,000	\$430,000	\$80,000	\$610,000	\$1,370,000		Full scale program for residents in Sub-district A&B. Carts amortized over 10 years. Collection costs based on \$2.78/hhld (MSW collection modeling). Implementation costs include audits.
<b>PROCESSING</b>								
Aerobic Processing Facility	\$90,000 (staffing for development of facility)	\$90,000	\$90,000	\$881,000 - \$2,175,000	\$4,700,000	\$2,900,000 - \$6,100,000	\$520,000	65,000 tpy food waste + 65,000 tpy yard trim, Aerated Static Pile – outdoor or enclosed. Land and facility amortized over 20 years. Implementation includes planning and permitting costs.
Anaerobic Processing Facility	\$90,000 (staffing for development of facility)	\$90,000	\$90,000	\$887,000 - \$1,518,000	\$4,600,000 - \$5,800,000	\$3,037,000 - \$5,143,000	\$880,000	65,000 tpy food waste – Anaerobic Digester, costs reflect nature of feedstock. Implementation includes planning and permitting costs.
<b>SUPPORTING INITIATIVES</b>								

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
Community Composting	\$390,000	\$245,000	\$170,000	\$5,000	\$1,000			Staffing to promote, operate and maintain 5 sites, with some volunteer help at each site. Some additional operating and maintenance costs per site, including tools, water, insurance, etc. Implementation costs to construct composters.
Backyard Composting	\$390,000	\$245,000	\$170,000		\$12,000			County provides subsidized composters.
On-Farm Composting								Processing option only.
<b>C&amp;D Materials Diversion</b>								
C&D MATERIALS RECYCLING								
Planning				\$65,000 - \$105,000				Waste audit and business case.
Policy Approach	\$312,500	\$262,500	\$212,500					Staffing and outreach materials.
DEVELOPMENT OF A C&D PROCESSING FACILITY								
Low Tech Facility - Dump & Pick	\$690,000	\$490,000	\$340,000	\$100,000	\$890,000	\$400,000		100 tpd facility - concrete/block, metal (Fe), OCC, clean wood. Facility and land amortized over 20 years.
High Tech Facility - covered facility, with conveyors and pickers	\$690,000	\$490,000	\$340,000	\$200,000	\$3,180,000	\$1,000,000		500 tpd facility - concrete/block, metal (Fe), OCC, clean wood, drywall, shingles, rigid plastic, C&D fines, maybe non-Fe/wiring, curbside materials (PET bottles, Al cans). Facility and land amortized over 20 years.
<b>Recovery Park &amp; Drop-off Depots</b>								
Resource Recovery Park				\$30,000				Facilities and business plan. No capital costs estimated - would be included in other options.

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
Recycling/Drop-off Depot	\$690,000	\$490,000	\$295,000	\$125,000 - \$177,000	\$300,000 - \$400,000	\$400,000 - \$600,000		Drop-off depot with roll-off bins, weighscale for trash and reuse area. Implementation costs include planning and permitting. Facility and land amortized over 20 years.
<b>Regulatory</b>								
Mandatory Food Scraps Diversion	\$870,000	\$580,000	\$385,000					Develop a phased in commercial food waste ban.
Bans on Shopping Bags and Increased Fee for Paper Bags	\$167,500	\$115,000	\$85,000					Outreach, education and enforcement.
Reduce EPS Products	\$167,500	\$115,000	\$85,000					Outreach, education and enforcement.
Reduce Single-use Plastic Water Bottles	\$167,500	\$115,000	\$85,000					Outreach, education and enforcement.
Reduce Single-use Food Ware	\$167,500	\$115,000	\$85,000					Outreach, education and enforcement.
Reduce Single-use Plastic Film Packaging	\$167,500	\$115,000	\$85,000					Outreach, education and enforcement.
Multi-Family Design Standards	\$290,000	\$240,000	\$190,000					Outreach, education and enforcement.
Special Events Recycling Requirements	\$870,000	\$670,000	\$520,000					Outreach, education and enforcement.
Commercial Franchising	\$870,000	\$670,000	\$520,000				TBD	Outreach, education and enforcement, revenue of 5-20% of fees.
Legislation for EPR of Other Materials								Assume no additional costs for outreach, education and could be done by existing staff.
Container Deposit Legislation								Assume no additional costs for outreach, education and could be done by existing staff.

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
<b>Changes to How Materials are Collected</b>								
Standard Trash Container	\$780,000	\$580,000	\$385,000			\$700,000 - \$1,800,000		Provision of containers to either just Sub-district A or both A&B. Capital costs include containers amortized over 10 years.
Clear Bags	\$780,000	\$535,000	\$362,500					Assume residents have containers for Organics and buy own bags. .25 FTE, outreach, education and enforcement.
Reduced Frequency of Trash Collection	\$780,000	\$535,000	\$362,500		TBD			Assume no other container required. Staffing for outreach, education and enforcement.
Reduce Bulky Trash Collection	\$335,000	\$240,000	\$145,000		TBD			Number of items per setout reduced, allowance at TS reduced.
Single Stream	\$780,000	\$580,000	\$430,000		TBD	\$1,800,000 - \$2,000,000		County provides containers (65 or 95 gallon). Changes to MRF or processing costs not included. Capital costs include containers amortized over 10 years.
Wet/Dry	\$780,000	\$580,000	\$430,000		TBD			Commercial sector responsible for collection and processing of "wet" materials. Staffing for outreach, education and enforcement.
<b>Operational Changes</b>								
Trash collection expanded to Sub-district B	\$780,000	\$580,000	\$430,000		TBD			County provides trash collection to Sub-district B, residents provide own containers.
Leaves & Yard Trim	\$780,000	\$580,000	\$430,000		TBD			Operational savings due to reduction in service.
Mobile Collection of Divertible Materials	\$780,000	\$580,000	\$430,000		TBD	TBD		Capital and operating costs for trailer and staff.
Curbside Glass Handling	\$780,000	\$580,000	\$430,000		TBD	TBD		Capital and operating costs for bins/depots and handling.

	Staffing for Outreach and Enforcement and Outreach/Promotion and Education Materials			Implementation Costs	Annual Operating Costs	Annual Capital Costs	Potential Annual Revenue	Assumption
	Year 1	Year 2	Year 3					
<b>Other Supporting Initiatives</b>								In general, require minimal staff time. PAYT would require more staff time depending on how implemented and potentially costs for containers.
<b>Education and Enforcement</b>								Staffing costs for education and enforcement embedded in other options.