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# SAVE AS YOU THROW FOR MONTGOMERY COUNTY, MARYLAND: FEASIBILITY ASSESSMENT AND IMPLEMENTATION PLAN

**FINAL**

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# SAYT IMPLEMENTATION PLAN FOR MONTGOMERY COUNTY, MARYLAND

## CHAPTER 1: SUMMARY AND INTRODUCTION

### 1.A Executive Summary

Montgomery County currently experiences high diversion and capture levels. However, the County is exploring additional options to continue toward higher diversion, while maintaining excellent service to its customers and maintaining a system that is responsible and bulletproof from a fiscal perspective.

This Project's purpose was to develop a feasible design and implementation plan for a Save-As-You-Throw (SAYT)<sup>1</sup> program for Montgomery County, MD. These systems work to increase recycling and diversion by providing financial incentives to each household by charging more for larger amounts of trash, and providing convenient recycling and diversion options that do not vary by volume. SAYT's pocketbook incentives are among the most effective strategies for gaining and maintaining increases in recycling and diversion. Not only do the systems lead to substantially higher diversion, but they are also perceived as more equitable, given that households that set out one small can no longer pay the same as those setting out many cans for collection.

Save-As-You-Throw (SAYT) systems are, at their core, a new billing signal: setting out small amounts of trash for collection is cheaper than setting out large amounts of trash. Customers change behavior because SAYT encourages them to reduce trash by diverting more of their remaining recycling and compostable materials into the available programs, and other waste reduction behaviors. This SAYT system requires several features to be effective, including:

- **Meaningful rate differentials:** The price signal for different trash collection levels needs to be significant and meaningful enough to incentivize changes in household waste management behavior.
- **Small service level options:** Multiple service level options are needed, but small trash cart service levels need to be available to provide incentives to those households willing to reduce more and avoid missing that extra diversion.
- **Convenient recycling and diversion options:** Recycling and yard trim programs and diversion options that are well-known, convenient, and have the minimum of barriers to use are essential to facilitate the desired behavior changes, and to avoid making undesired behaviors the most convenient option to reducing trash.

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<sup>1</sup> Also called Pay-As-You-Throw (PAYT) systems, as well as unit-based pricing, volume-based pricing and other names. The principle remains: setting out larger volumes of trash for collection results in higher charges for that collection.

- **Effective, supporting outreach:** The program must be well-understood by households for it to be effective and for the program to be accepted and successful.<sup>2</sup>
- **Enforcement:** All levels of the system must be consistent about enforcing the system’s set-out size limits and incentives, or the program will not be effective.

The system for Montgomery County was designed to meet each of these best practice elements.

**Change Needed:** SAYT is the most effective and cost-effective method of increasing diversion. The program, as designed for Montgomery County is expected to increase diversion substantially. However, introducing SAYT in Montgomery County requires support and change at management and operational levels, including changes in long-standing financial, collection, and facility operations and procedures. The program’s positives do not come without willingness to make changes.

### OVERVIEW OF THE NEW SYSTEM

The recommended SAYT system for Montgomery County includes a variety of new features and changes. The program’s ultimate effects include adding substantial diversion and capture of recoverable materials, harmonization of trash and recycling service County-wide, and maintains financial stability of the County’s solid waste system. A summary of the key elements of the recommended system follows.

- **Harmonized Collection:** Trash collection will be provided via multiple zone-based contracts with private haulers in both Subdistrict A (continuing with 3 contractors) and Subdistrict B<sup>3</sup> (recommended 3 contractors). Recycling and yard trim service will continue to be provided county-wide. Service will be provided in three sizes of uniform County-provided carts<sup>4</sup>: 32-gallon, 64-gallon, and 96-gallon<sup>5</sup>, with households selecting the size needed. Larger recycling carts will also be provided to all households for commingled containers to allow for higher recycling volumes anticipated.
- **Diversion and Facility Changes:** The new incentives are expected to increase residential diversion County-wide by 10 percentage points, for a resulting 43% diversion and 78% capture rate for the residential sector.<sup>6</sup> Because Montgomery County’s recycling facilities are near-capacity, the new system will require management and procedure changes. Most noteworthy is the need to add shifts to operate the Paper Processing Facility (PPF) 6 days to process the extra materials collected during the week.

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<sup>2</sup> For reasons described in this report, related to aspects of the billing system, including an annual rather than monthly billing system in Montgomery County, the outreach efforts for this system are especially important.

<sup>3</sup> Contracted trash collection in Subdistrict B is a change, and requires changes to Chapter 48. Because of these changes, the system change cannot begin before Chapter 48 is modified (which is expected to be fairly time-consuming). The process of issuing RFPs for service, and stopping or modifying existing contracts to incorporate changes needed for SAYT, will also consume up-front time.

<sup>4</sup> Carts were selected because they are less expensive for households (paying back in 5 years over bag systems), allow much safer collection than bags, reduce vermin, and do not add an extra layer of plastic in landfills.

<sup>5</sup> Multiple 96-gallon carts are allowed.

<sup>6</sup> 16,163 additional tons of recycling, 616 tons of yard trim, 12,534 tons of waste reduction (or else total reduction from trash), and reduction of 46,396 metric tons of carbon dioxide emissions.

- Charges and Financial Stability:** Avoiding risk to fiscal stability was a paramount County consideration. As a result, the SAYT price signal is not provided in a regular and visible trash bill, but instead is included as a change in values of existing elements of the residential (property) tax bill – the System Benefit Charge (SBC) and Refuse Collection Fund (RCF). The SBC/RCF charge for the 32-gallon container reflects average SBC costs across all households, and the price signal for 64-, 96-, and multiple 96-gallon containers is added to this lowest charge.<sup>7</sup> The price signal modeled for the County’s SAYT system is approximately the mid-point of the amount recommended by the literature.<sup>8</sup> The resulting percentage change from current fees is a less than 1% decrease. The County’s finance department will need to modify the system to allow for records to allow multiple cart sizes (related to cart size choice) and changes in these assignments over time. In addition, modifications to support low-income discounts are also recommended.
- Supporting Outreach and Procedural Changes:** Harmonized collection allows outreach to become uniform across the County as well. Effective outreach will be more vital in Montgomery County’s system than most jurisdictions, because the price signal is not provided in a regular and visible trash bill, but instead is included as one, somewhat buried, element in the tax bill. Up-front outreach will need to focus on highlighting the incentives provided by the price signal (and recommended behavior changes) plus publicizing the steps homeowners need to take to select the preferred trash cart size option. On-going outreach on diversion strategies and incentive reminders will be important. Procedural changes need to include: pre-paid stickers for waste beyond the subscribed / selected cart size, more limited “free” bulky collections (additional paid options available), and no more “free” trash options at the transfer station. New procedures at the finance department are needed to process low-income options, and financing and hauler procedure changes are needed to support household changes in cart sizes. The new system also includes a program of regular data collection of an array of important metrics, and annual reporting (semi-annual in the first year) on program performance for continual system improvement.

The barriers to a speedy implementation in Montgomery County include the following; the timing of several may be under the control of Montgomery County itself.

- Chapter 48:** Changes to elements of Chapter 48 require a council process and public hearing process that the County would need to manage.
- Contracting:** If the County actually cannot make modifications (renegotiate, or terminate and re-bid) to existing trash hauler contracts in Subdistrict A, then their timing delays roll-out of the new system. Subdistrict B will need new zone-based Trash contracts. Processes for issuing RFPs

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<sup>7</sup> This charge-setting protocol assures financial stability, and will collect more than sufficient funds to support the system. Money collected above the cost of service will need to be addressed through contingency funds or other approved financial procedures.

<sup>8</sup>The literature (See Econservation Institute, 2015, “PAYT: 2014 Update”, prepared for EPA Region 9, 2015. Skumatz, et.al.) includes statistical research that recommends that, to encourage behavior change, the PAYT price signal should be set at 50% to 80% higher price for double the service (for 64 vs. 32 gallons), and that differential is repeated for every additional 32 gallons of service. A value of 60% was used for the Montgomery County modeling, to leave room for the County to increase incentives in the future.

and contracts in most counties can be accomplished in about 6 months or so. The timing on this is affected by internal County procedures, but also are unlikely to be able to start until after changes are made to Chapter 48.

- **Cart Ordering:** The County will need new carts. The County has an existing contract for carts, but only limited sizes. If it is determined that the contract cannot be modified, there will be time needed to solicit bids for a new contract. In addition, large cart orders have been taking a minimum of 6 months (this would be part of negotiations), unless the existing contract can accommodate better terms.
- **Staffing at facilities:** The recycling facilities need to process more volume, and additional shifts are the recommended approach. Some facility modifications will be needed, but the major delay may be obtaining more staff, and revising procedures (and possible permitting) for managing an extra processing day.

The remainder of the changes needed will also take time, but are mostly internal (outreach, procedures, financial systems).

The details of each step of how these changes are accomplished are provided in the report. A detailed implementation plan for a system pilot test is also provided so the County will be able to fine-tune design and operations toward successful roll-out of the program.

## 1.B Introduction to Study Approach

The project's scope called for the work to be conducted in two phases:

- **Phase 1: Feasibility study:** This first phase of work gathered data about Montgomery County's system, assembled options for each stage of the design and roll-out of a SAYT system, and, for each relevant topic, identified one or more options that met the criteria of being feasible or most feasible for "fit" in Montgomery County's system. This phase also developed planning-level cost estimates attributable to the change to a new system. This work relied on an assessment of Montgomery's system, and review of literature on SAYT systems<sup>9</sup>. The focus was not to provide program recommendations, but to identify whether feasible strategies were available that could support SAYT in Montgomery County. This feasibility work assessed strategies and impacts from these industry sources and determined that:
  - 1) a SAYT system could be expected to divert significant additional tonnage;
  - 2) there were collection and containerization strategies that could be suitable for both Subdistricts A and B.
  - 3) there were feasible options for mitigating each of the potential negative effects of concern to Montgomery County;

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<sup>9</sup> See Appendix E: Feasibility Assessment – Discussion of Mitigating Negative Effects. The analyses and options considered in this report are based on extensive review of the literature and lessons and information from the many case studies embedded in reports and articles and the consultant team's working experience with other SAYT communities across the US and Canada. Many of these communities are identified throughout this report.



- 4) the incremental costs would be negative (savings) or manageable increases compared to current costs, and
- 5) most challenging, there were feasible, if uncommon, billing options available to be used to cover the system's costs.

The feasibility work's results were discussed with staff for feedback, and it was determined that work should continue, toward developing an implementation plan for the SAYT system (this report). The summary of the work on the feasibility study is summarized in Appendix E: Feasibility Analysis.

- **Phase 2: Implementation Plan:** The implementation plan built on the results in the feasibility study. The Implementation Plan work developed concrete, integrated recommendations for design and implementation of the SAYT system, for both a pilot program, and ultimately, a rolled-out, full-scale on-going County-wide SAYT system in Subdistricts A and B. This work, reflected in the body of this report, is supported by more detailed information in the appendices. Clear recommendations are provided for each step in the design and implementation of the SAYT program and an associated supporting pilot.

The implementation recommendations form the bulk of the body of this implementation plan, with introductory remarks before the recommendation (in a shaded box), and limited supporting or explanatory information, tables, or other materials included afterwards. Note that there are two kinds of shaded boxes.

- Blue-shaded boxes: These boxes describe implementation of policy or design recommendations.
- Beige-shaded boxes: A few boxes describe computations or quantitative results, and are shaded beige.

The implementation recommendation boxes address the following topics:

- Clear statement of the design / implementation recommendation
- Steps to accomplish the recommendation
- Responsible parties and timelines
- References to other recommendations where needed
- Separate discussions of the impacts on: households, county, haulers, and sometimes others.

The Implementation Plan portion of the work developed overall conclusions associated with the potential of a SAYT program in Montgomery County, MD:

- SAYT can add almost 10 percentage points of diversion to the Single-Family sector, and significant source reduction is a portion of this diversion.
- A system of sized carts, collected by sets of contracted haulers operating in Subdistrict A, and separate contracts for Subdistrict B, can provide effective and efficient collection for this SAYT program.
- Well-suited strategies to address recycling contamination, litter and illegal dumping, container overflow, non-payment, and low-income options were identified.
- The incremental costs were estimated to be negative (savings) compared to current costs.

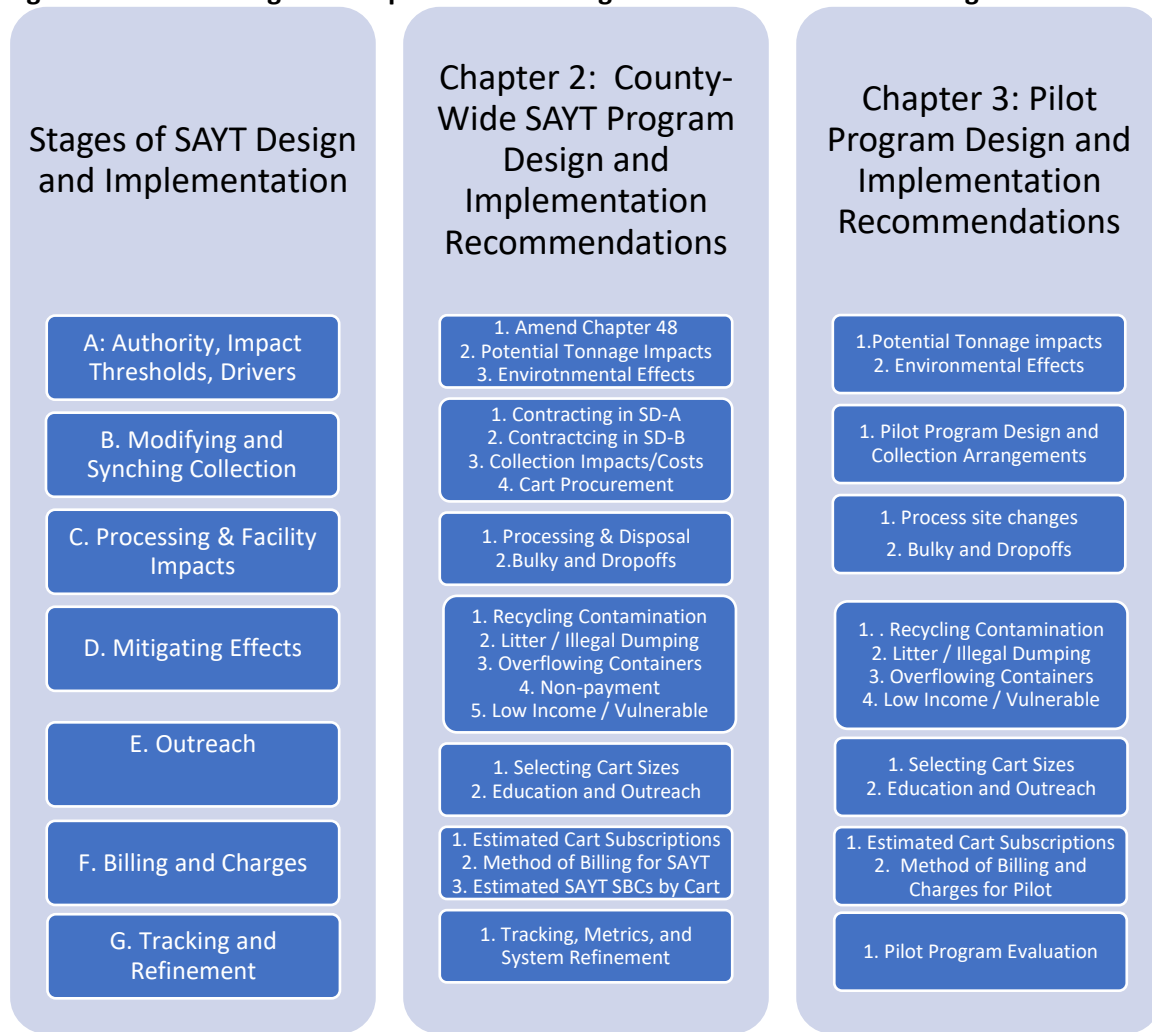
- Most challenging, a method of providing graduated, incentive-based charges for the costs to the County for the SAYT program was developed. The system is uncommon, involving updates to the System Benefit Charge (SBC), which is billed annually through the property tax bill. The advantages of the charging method developed is that there are minimal or no financial risks to Montgomery County’s waste management system or fund introduced by the recommended SAYT system.

This report presents this Implementation Plan. Numerous appendices are included to provide detail on information or data supporting the recommendations, review of options considered and rejected, financial calculation details, survey data, and other information used to support the study and its analyses.

### **1.C Review of Detailed Recommendations**

The project required developing recommendations on numerous elements of a working SAYT system. Figure 1.1 illustrates the key phases of the implementation. This figure also identifies the organization of the report. Chapter 2 is the County-wide, full implementation of the SAYT program. Chapter 3 outlines the steps that are expected to be used in the Pilot test.

**Figure 1.1: SAYT Design and Implementation Stages: Full Roll-out and Pilot Program**



The specific recommendations that comprise the SAYT implementation plan are listed below. Figure 1.2 includes the recommendations for the full-scale system. Figure 1.3 includes the recommendations for the pilot program on SAYT.

**Figure 1.2: Summary of Implementation Plan for the SAYT Program County-wide**

- **2.A.1 Amend Chapter 48 to Implement Contracted Service in Subdistrict B** → Trash and Recycling Service in Subdistrict B is changed to County Contracts through an amendment to Chapter 48 so that all County waste and recycling services are contracted and billed in the same manner for all residents. This change must be enacted as a prerequisite to implementation of the SAYT program.
- **2.A.2 Estimated Tonnage Reduction from SAYT** → The County’s residential tonnage disposal is expected to decrease by 10 percentage points<sup>10</sup>, expressed as the percent of overall residential tonnage generated. The estimate includes 5.4 percentage points diverted to increased recycling, 0.2 percentage points to yard trim , and 4.2 percentage points are new source reduction.

<sup>10</sup> The analyses and options considered in this report are based on extensive review of the literature and lessons and information from the many case studies embedded in reports and articles and the consultant team’s working experience with other SAYT communities across the US and Canada. Many of these communities are identified throughout this report.

- **2.A.3 Estimated Value of Avoided Greenhouse Gas (GHG) Emissions from SAYT in Montgomery County** → A conservative estimate of the Metric Tons of Carbon Dioxide equivalent (MTCO<sub>2e</sub>) emissions avoided due to SAYT is 46,396, MTCO<sub>2e</sub> per year. The annual dollar value of these reductions range from \$2,864,516 to \$13,065,235 per year, depending on the market value used. This value represents additional environmental benefits attributable to the implementation of SAYT and are often used by communities to compute more enhanced benefit-cost ratios.
- **2.B.1 Trash Service Provision in Subdistrict A** → Trash Service in Subdistrict A is continued with County Contracts with private haulers assigned to each of 3 Service Regions in Subdistrict A.
- **2.B.2 Trash and Recycling Service Provision in Subdistrict B** → All service areas will be managed under the same requirements as Subdistrict A. Trash Service in Subdistrict B is changed to County Contracts with winning private haulers assigned to one of 3 Service Regions sectors in Subdistrict B.<sup>11</sup>
- **2.B.3 Collection Route and Truck Impacts and costs** → The Project Team modeled the trash collection for staff reduction and route reduction. The Project Team used the estimates for route reduction and the resulting total number of routes needed to collect the estimated trash tonnage under the recommended cart based SAYT program. The estimated cost incorporated the cost reduction from the truck/route reduction per day.
- **2.B.4 County Owned Cart Procurement Service Provision in Subdistricts A and B** → Trash service with carts in all service areas is changed to variable sized carts<sup>12</sup> (32 gallon, 64 gallon, 96 gallon) for trash collection and an additional 35 gallon cart for recycling (containers; residents already have a fiber recycling cart) with fully automated and/or semi-automated collection.
- **2.C.1 Processing and Disposal Sites** → County adjusts processing and disposal facility budgets based on forecasted cost projections in following sections. County review and amend recycling processing contract to accommodate additional forecasted tons per year at the CCL/PPF. In collaboration with recycling and yard trim facility contractor(s), County review and, as needed, update procedures for CCL, PPF and yard trim contractor(s) to alert Montgomery County regarding contaminated loads of recycling and yard trim, to conduct recycling waste sorts, and to report tons of recyclables and yard trim received by hauler, truck number, date, and time.
- **2.C.2 Modifying Bulk Waste pickup and drop off options for households in both Subdistricts during Implementation** → County phase out current practice of up to five free bulky waste pickups on request for Subdistrict A and move toward two times a year (spring and fall) bulky waste pickups on a schedule<sup>13</sup> in all areas. Discontinue free trash drop off at Shady Grove Transfer Station and Poolesville Beauty Spot. Additional charge (use prepaid stickers) for extra bulk material or material can be taken to TS for extra charge (prepaid).
- **2.D.1 Mitigating recycling contamination in both Subdistricts during Implementation** → County maintain up-to-date recycling information, continue cart-tagging program, and implement consequences for repeat offenders.
- **2.D.2 Mitigating Litter and Illegal Dumping in both Subdistricts during Implementation** → County implement plan to address overflowing containers. County collect data on litter and illegal dumping hotspots in neighborhoods to focus volunteer cleanup efforts. County implements right balance of cost-effective and convenient bulky waste disposal options.

<sup>11</sup> Certain County labor protection laws – including requirements for wages, labor peace agreements, and displaced workers – apply only to employees of trash haulers under County contracts. Expanding Subdistrict A requirements to the entire residential service areas in the County would extend these local protections to more trash collection workers. *Trash and Recycling Collection: An Evaluation of Current Policies, Montgomery County Office of Legislative Oversight, Report 2019-17, November 12, 2019*

<sup>12</sup> Carts were chosen over bags and stickers for multiple reasons including ongoing costs and limited availability of bags, potential risks to waste collection workers, public health and safety concerns, environmental issues related to plastic bag usage, and negative impacts on neighborhood aesthetics and litter. Carts offer a one-time cost, reduced risk of injury, and alleviate issues associated with bags such as vermin attraction and excessive plastic waste. See Appendix E: Feasibility Analysis for more information.

<sup>13</sup> Recommendation for scheduled pickup 2x/year is most efficient, easiest to track and easiest to plan around. The other option is to reduce by-request pickups from 5x/year to 2x/year.

- **2.D.3 Overflowing Containers in both Subdistricts during Implementation** → County to provide stickers for purchase at retail outlets for additional trash beyond cart capacity. Residents will affix sticker on their own trash bag (32 gallons or smaller) and place bag next to their trash cart for pickup.
- **2.D.4 Mitigating nonpayment in both Subdistricts during Implementation** → The County continues to inform homeowners about Homeowners' Property Tax Credit program for those living on limited or fixed incomes. County continues established process for nonpayment or late payment of property tax bill (which includes the SBC and RCF). County continues to provide a variety of methods to pay property tax bill. County continues to provide solid waste services to that property regardless of property tax payment status.
- **2.D.5 Mitigating Effects of SAYT on Low Income Customers** → Low-income homeowners submit qualifications to the County Department of Finance, Division of Treasury (or designated Department) to apply for a 10-20% discount on their SBC. The discount is applied only to those qualified low-income customers for a discount based on requesting the smallest cart size. Households are certified every other year.
- **2.E.1 Customer Cart Choice Process in both Subdistricts** → Have three different options for homeowners to choose the size of their cart: online web form, paper form that can be e-mailed, and by calling MC311. Allow one cart size increase per household, then additional changes incur a fee. Downsizing cart choice should always be no cost to homeowner but a cart switch payment to hauler should be incorporated into all hauler contracts.
- **2.E.2 Education and Outreach in both Subdistricts** → Continue the award-winning outreach programs Montgomery County has; craft new, clear messaging and outreach specific to SAYT implementation and why it is important; measure effectiveness of these efforts.
- **2.F.1 Trash Cart Size Service Level Requests** → The estimate of the cart size requests for the County-side SAYT program is expected to be: 54% choosing 32-gallon can, 28% selecting 64-gallon serviced, 16% selecting 96-gallon carts, and 2% requesting more than 96 gallons of service (second cart).
- **2.F.2 Method of Charging for SAYT System Charges-for-Service County-Wide** → The County's current SBC charge for costs related to solid waste management services is used as the SBC level charged for the smallest trash container offered (32 gallons). Extra charges are then added to the base SBC to reflect the volume-based SAYT charge incentives associated with each larger cart size offered. These, along with the RCF, become the uniform County-wide fee-for-service charges under the SAYT system. These fees are in place for the year. Households up-sizing their carts are provided a separate invoice including a delivery fee plus the extra incremental SBC associated with the larger cart size.<sup>14</sup>
- **2.F.3 Variable Charge Levels for Service County-Wide** → Estimation for County-wide annual SBC levels for SAYT cart sizes (based on incremental changes from existing SBC base fee) are: \$307.98 / year for properties selecting 32-gallon trash service; \$438.12 / year for properties selecting 64-gallon trash service; \$568.25 / year for properties selecting 96-gallon trash service, and \$958.65 for properties selecting an additional 96-gallon cart. These fees reflect a 60% SBC increase for 32-gallon increments of service over the first 32-gallon cart, and are based on the projections of cart size distribution developed by the study. The RCF billed to all households will decrease from a projected \$127.00 (2023) to \$150.22 (2023). Rates for overflow stickers are confirmed at \$3.50-\$4 per sticker (assuming a 10% commission for retailers), and the cart switch fee should be determined based on costs negotiated with the contracted agent (hauler or specialized cart firm).
- **2.G.1 Tracking, and Metrics** → County adopts and implements tracking with real-time tracking software used by collection vehicles to inform program enforcement, outreach, program evaluation, and continuous improvement.

<sup>14</sup> One first free cart size increase in the first year is allowed without the delivery fee. Cart size decreases are allowed without delivery charges. However, the reduction in SBC is not provided until the next tax bill. The Consultants recommend that the Department of Finance, Division of Treasury work to incorporate a retroactive reduction in the next tax bill for the proportional savings due, but the Department will need to determine if this can be accommodated.

**Figure 1.3: Summary of Implementation Plan for the SAYT Pilot Program**

- **3.A.1 Estimated Tonnage Reduction from SAYT** → The County’s residential tonnage disposal is expected to decrease by 11 percentage points<sup>15</sup>, expressed as the percent of overall residential tonnage generated. The estimate includes 5.4 percentage points diverted to increased recycling, 0.4 percentage points to yard trim, and 4.5 percentage points are new source reduction. Tonnage estimates for the pilot test are 123 total tons in the first year (assuming all pilot homes are treated at one time) provided in the table after this box.
- **3.A.2 Estimated Value of Avoided Greenhouse Gas (GHG) Emissions from SAYT in Montgomery County** → A conservative estimate of the Metric Tons of Carbon Dioxide equivalent (MTCO<sub>2e</sub>) emissions avoided due to the Pilot SAYT program is 194 MTCO<sub>2e</sub> per year. The annual dollar value of these reductions range from \$11,977 to \$54,626 per year<sup>16</sup>, depending on the market value used. This value represents additional environmental benefits attributable to the Pilot SAYT program. After the Pilot is completed, this estimate can be refined based on the actual tonnage shifts.
- **3.B.1 Pilot** → Conduct 12-month pilot<sup>17</sup> to gauge changes in waste generation and diversion, gain insight on contamination issues, and evaluate customer service efficiency.
- **3.C.1 Processing Sites for Pilot** → Scale tickets with tonnages for pilot route from disposal and processing facilities required to be reported monthly to the Montgomery County Department of Environment by recycling processing and disposal contractors. No change required for facility operations procedures, staffing, or hours.
- **3.C.2 Modifying Bulk Waste pickup and drop off options for Pilot** → County maintain service level status quo for bulky waste pickup options and transfer station trash drop off during SAYT pilot.
- **3.D.1 Mitigating recycling contamination along pilot route** → County maintain up-to-date recycling information, continue cart-tagging program, and implement consequences for repeat offenders.
- **3.D.2 Mitigating Litter and Illegal Dumping during pilot** → County address overflowing containers on pilot route. County maintain status quo during pilot for bulky trash pickups (up to 5x/year/household by request).
- **3.D.3 Mitigating Overflowing Containers during Pilot** → County address overflowing containers by providing a vehicle for additional waste. When distributing carts, County also provides 2 free bags for excess trash to households on pilot route. Bags should be uniform in size, 32 gallons or less, and provided by the County to pilot households during cart distribution.
- **3.D.4 Mitigating Effects of SAYT on Low Income Customers for the Pilot** → For the pilot program, the recommendation is to test the very basics of a reduction in charges for the smallest container for low-income customers. Information is provided on how to apply for the discount, and a second \$10-\$20 gift card is provided for qualified homes on the pilot test route.
- **3.E.1 Customer Cart Choice Process for Pilot** → Have three different options for homeowners on pilot route to choose the size of their cart: online web form, paper form that can be e-mailed, and by calling MC311. Allow one cart size increase per household throughout pilot period (12 months). Households can decrease cart size at any point throughout pilot period and receive the higher value gift card.
- **3.E.2 Education and Outreach for Pilot** → County craft new messaging and outreach specific to SAYT pilot. Communicate pilot details and ‘asks’ directly to pilot households. Disseminate general messaging on pilot for whole county.
- **3.F.1 Trash Cart Size Service Level Requests (pilot)** → The estimates for percent of households selecting each size of trash cart are: 54% on 32 gallons, 28 % on 64 gallon, 16% on 96 gallon, and 2% on more than 96 gallons (second cart).

<sup>15</sup> County wide decrease is estimated at 10 percentage points. Subdistrict A (where the pilot is planned) is predicted to experience a slightly higher diversion.

<sup>16</sup> The consultants also developed a scenario that assumes the SAYT incentive is less effective. This scenario results in 145 MTCO<sub>2e</sub> per year with total savings of \$8,982 to \$40,969.

<sup>17</sup> The Project Team initially recommended a 9-month pilot but Montgomery County staff wanted to ensure the pilot spanned the length of all the seasons to more accurately gauge trash and recycling generation.

- **3.F.2 Billing and Charges for the SAYT Pilot** → Households selecting smaller containers, and those moving to smaller containers during the pilot, receive gift certificates of a higher value as a proxy for receiving lower SBCs for use of smaller carts. The only set up for this system is that the Solid Waste Department, in cooperation with the Department of Finance and Division of the Treasury, 1) receives requests for cart sizes, 2) delivers the carts; 3) purchases and delivers gift cards to the relevant households, and 4) collects carts at the end of the pilot test.
- **3.G.1 Pilot Program Evaluation** → Establish baseline metrics and conduct an ongoing evaluation of the pilot to forecast program impact on tonnages collected, changes to collection routing and processing facility staffing and operating days, cart sizes for procurement, and to understand experience and support of the program by participating households.

Chapter 2 describes the Full-County SAYT program recommendations. Chapter 3 describes the design and delivery recommendations for the SAYT Pilot Program.

## CHAPTER 2: COUNTY-WIDE SAYT PROGRAM IMPLEMENTATION RECOMMENDATIONS

This chapter provides the detailed design and implementation steps associated with the recommended SAYT program for Montgomery County<sup>18</sup>. See the Feasibility Report for details on the scenarios that were evaluated.<sup>19</sup> The sections within this chapter cover, in turn, the phases of: authority, thresholds and drivers; modifying and synching collection; processing and facility impacts; mitigating negative effects; carts and outreach; billing and SBC/RCF Charges; and tracking and program refinement.

### 2.A Authority, Impact Thresholds, Drivers

There are two threshold decisions associated with the Montgomery County system:

- Can the new charging system be legally introduced, and
- Would the projected tonnage diversion and other impacts be large enough to be worth the complexities of a SAYT system?

The answer to the first question is included in this section. The following section of the report addresses the tonnage projections.

Based on the Project Team’s research and analysis, the implementation recommendations for both Subdistrict A and Subdistrict B are to implement variable rate pricing and variable size trash carts, with the County owning the trash carts. In addition, recycling collection would become cart-based with an additional recycling cart provided to all residents for containers<sup>20</sup>. The result of this change is an increase in the quantity of recyclables that are collected and a reduction in the quantity of trash collected.

All collection services for trash and recyclables collection would be provided through private sector haulers through one or multiple contracts in both subdistricts, similar to the current arrangements in Subdistrict A. The cost analysis finds the most savings with fully automated cart collection<sup>21</sup>, but based on conversations with Montgomery County staff, automatic collection will not be possible in certain areas of the County due to issues like power lines, narrow streets, and street parking. This is addressed in the recommendations that assume 20 percent of the haulers utilizing cart-based fully automatic

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<sup>18</sup> The SAYT recommendations were constructed to be internally consistent and in line with best practices for a SAYT program. One reviewer asked whether impacts associated with omitting or adding pieces of the program were modeled. The consultants noted the impacts of lower incentives (lower diversion results and processing costs impacts, see Appendix E). The project also modeled the impacts associated with carts vs bags (carts had lower costs, better working safety, fewer vermin, similar diversion, see Appendix F). The items that were not modeled include vital components for a successful program including, substantial outreach, collection contracts, larger recycling carts, and other elements.

<sup>19</sup> Unit-Based Pricing for County-Provided Residential Solid Waste Collection Services – Montgomery County / Maryland Environmental Services: Feasibility Phase – October 2022

<sup>20</sup> Carts were chosen over bags and stickers for multiple reasons including higher lifetime costs for bags, potential risks to waste collection workers, environmental issues related to plastic bag usage, vermin considerations, and negative impacts on neighborhood aesthetics and litter. Carts offer a one-time cost, reduced risk of injury, and alleviate issues associated with bags such as vermin attraction and excessive plastic waste. See Appendix E: Feasibility Analysis for more information.

<sup>21</sup> Based on analysis in the model and in well documented cart collection efficiency differences. Examples include: Regina, Saskatchewan, Torrington, CT, and San Jose, CA.



trucks and all other collection is cart based with semi-automated collection<sup>22</sup>. This approach creates a cost-effective program as part of implementing SAYT. The Project Team recommends trash and recycling service changes for the following administrative and service areas.

### 2.A.1 Amend Chapter 48: Solid Wastes - Regulations

The first recommendation and the key to implementing a SAYT program is to provide the necessary regulatory framework that allows contracting for all trash and recycling services for all residential properties in the County, which allows for charging all residents for these services. This step must be accomplished prior to moving forward with procuring new collections services.

**Recommendation to Amend Chapter 48 to Implement Contracted Service in Subdistrict B** → Trash and Recycling Service in Subdistrict B is changed to County Contracts through an amendment to Chapter 48 so that all County waste and recycling services are contracted and billed in the same manner for all residents. This change must be enacted as a prerequisite to implementation of the SAYT program.

Elements / Steps include: All steps completed in 11 months (See Appendix L: Implementation Timeline, for complete timeline)

- Staff Internal Review Process with Recommendation to Council.  
**Timing: Completed within 3 months<sup>23</sup>**
- County Commission work session and public information meetings on SAYT recommendation.
- **Timing: Completed within 3 months after staff recommendation.**

County Commission approval of SAYT program.

- **Timing: Completed within 5 months after work session and public information meetings.**
- County amends the Solid Waste Management Plan, Section 3.2 Waste Collection to eliminate subdistricts and state that in all service areas (Subdistrict A and B) “the County provides trash and recycling collection services through competitively procured contracts with private service providers for single-family homes and townhomes and residential properties with six or fewer units.”
- County provides the **required notice<sup>24</sup>** that it plans to implement contract for service provision in Subdistrict B and will amend Chapter 48 to specify that services in all Subdistricts will be managed in the same manner as Subdistrict A is currently managed.
- Office of the County Attorney develops amendment to Code and provides legal review.
- County Executive reviews and forwards to Council.
- County conducts one information session for haulers on proposed system and amendments.
- County seeks approval through Council action to amend Chapter 48 and any associated regulations, such as the Memorandum of Understanding under waste collection license requirements, to contract for service in Subdistrict B based on Stakeholder process. Council would hold at least one public hearing as required

<sup>22</sup> Fully-automated collection is a common practice in cities across the U.S. It helps maintain worker safety, increases efficiencies, and decreases number of collection staff needed. Many large cities, Houston, TX for example, are mostly fully-automated, but some cities, like the City of Honolulu, HI and Minneapolis, MN, maintain a mix of fully- and semi-automated collection trucks due to alley access and potential hazards blocking collection. Note also that decisions about collection trucks will not be made by the County, but by their contracted haulers.

<sup>23</sup> According to Montgomery County staff, one year is a reasonable time to expect these changes to occur.

<sup>24</sup> The County may terminate the Memorandum of Understanding upon ninety (90) days advance written notice if it determines that it will bid routes or provide for collection of solid waste with its own forces, MEMORANDUM OF UNDERSTANDING AND INDEPENDENT COLLECTION CONTRACTOR AUTHORIZATION, Section 9: Termination, b. Other.

under the Council's Rules of Procedure. Council provides Public Notice for 30 days with public comment period.

Amend Chapter 48 as follows: Montgomery County – Chapter 48 – Regulatory changes.  
Capital Letters denote additions and strikethroughs denote deletions.

Solid Waste Collection – Eliminate all Subdistricts– AMENDED

48.00.04.03 with the same language that is stipulated for Subdistrict A for all areas.

(b) Within all areas the County must provide, or cause to be provided, collection services one or more times per week.

Eliminate Independent Contractors clauses: If the County provides, or causes to be provided, collection services one time per week for solid waste that is to be disposed of, and a resident desires more frequent collection for disposal, the County may authorize Independent Collection Contractors to provide additional collection services on behalf of the County. The Independent Collection Contractor may then enter into an agreement with a resident for additional collection beyond that which is otherwise provided.

**DELETE SECTION 48.00.04.07 Notice to Customers**

All collectors within the County collecting solid waste from residences within Subdistrict B of the Solid Waste Collection and Disposal District must provide the following notices to their customers, as stated below, or with equivalent alternative language acceptable to the Department of Environmental Protection.

For existing customers, the collectors must by August 31, 1993, notify residences within Subdistrict B of the Solid Waste Collection and Disposal District.

48.00.06.02 Creation of Subdistricts

(a) Within Subdistricts and service areas, the County must provide, or cause to be provided, Residential Collection one or more times per week. If the County provides, or causes to be provided, Residential Collection one time per week, and a resident desires more frequent collection, an Independent Collection Contractor may provide additional Residential Collection services on behalf of the County. Only an Independent Collection Contractor may enter into an agreement with a resident for additional collection beyond that which is otherwise provided.

**DELETE Subsection (b) –**

This regulation hereby divides the District into two subdistricts to be known as Subdistrict A and Subdistrict B.

(a) Subdistrict A consists of those areas of the District where the County or its contractor provides Residential Collection.

(b) Subdistrict B consists of those areas of the District that are not included within Subdistrict A.

COMCOR 48.29.01 County Solid Waste Collection Subdistricts

**DELETE SECTION 48.29.01.01 –**

A group of homeowners in either Subdistrict A or B may petition for transfer from its subdistrict to the other subdistrict. The procedures for transfer are as follows:

ALL Subsections (a) thru (k).

**MEMORANDUM OF UNDERSTANDING AND INDEPENDENT COLLECTION CONTRACTOR AUTHORIZATION**

The entire MOU may be unnecessary when independent contractors can no longer provide services in Subdistrict B.

When the County incorporates Subdistrict B under the contracted services that are used in Subdistrict A then the Memorandum of Understanding (MOU) that defines that a Contractor must collect non-recyclable solid waste from residences in Subdistrict B must be consistent with the requirements in Subdistrict A.

Amend the Following sections in the MOU, if necessary:

Section 3. Collection of Solid Waste

a. Arrangements with residents. Contractor must collect non-recyclable solid waste from residences with six or fewer dwelling units with which it individually contracts within Subdistrict B. Unless otherwise provided for in a contract with the County, Contractor will bill the residences for the costs of collection only. Contractor

Section 3. Collection of Solid Waste

- A. The County hereby grants to the Company the exclusive franchise, right and privilege to collect, transport, and dispose of non-recyclable solid waste from residences accumulating in the Service Area that is required to be offered for Collection to the Company in accordance with current laws, regulations, and ordinances for the term of and within the scope set forth in this Agreement<sup>25</sup>. The Company hereby accepts the franchise on the terms and conditions set forth in this Agreement. The County will designate specific collecting routes based on the current recycling routes in Subdistrict B. The County will award specific routes to Contractors based on a competitive procurement process.

**Timing:** 90 days based on Council process and Public Hearing timeframe.

**How Recommendation affects Residents:**

- This does not have an immediate effect on residents until new services are contracted

**How Recommendation affects Haulers:**

- Haulers will be affected by council process, public hearings and actions

**How Recommendation affects the County:**

- County staff carry out the steps above.
- Review and ordinance amendments by County Attorney
- County Council must approve amendment as prerequisite to implementation of SAYT program.

## 2.A.2 Estimated Tonnage Diversion from SAYT

The SAYT program is designed to encourage the diversion of recycling and yard trim remaining in the trash stream into the more appropriate stream. It also encourages careful purchasing and reduction, reuse, and repair. The driver of the many changes associated with Montgomery County’s proposed recommended SAYT system is the reduction of residential trash disposed, and the increases in recycling, yard trim, and source reduction (or waste reduction). The tonnage change was estimated as follows.

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<sup>25</sup> The program will allow a switch to larger carts and allow for a second cart for an increased SBC rate. The program also maintains bulky item collection and provides a solution for occasional excess trash generation. In addition, the RFP and the agreement between a hauler and the County for collection services can clarify that a second collection would be at an established cost.

**Recommendation related to Estimated Tonnage Reduction from SAYT** → The County’s residential tonnage disposal is expected to decrease by 10 percentage points<sup>26</sup>, expressed as the percent of overall residential tonnage generated. The estimate includes 5.4 percentage points diverted to increased recycling, 0.2 percentage points to yard trim , and 4.2 percentage points are new source reduction.

Elements / Steps to develop this estimate included:

- Data on existing tons in Subdistrict A and B by stream<sup>27</sup>, and the County’s waste composition study were used to calculate the current diversion rates, capture by material, and tons of each material remaining as available to divert in the trash stream.
- Based on the existing and planned diversion programs in Montgomery County, and the impact that SAYT has had on diversion elsewhere (from published literature), the consultants developed an estimate of diversion from each program was developed.
- The consultants confirmed that the diversion estimates for each stream (recycling streams, yard trim) did not exceed materials that remain in Montgomery County’s waste stream.
- The tonnage changes were provided to the next research steps for use in tonnages and flows, and impacts on facilities, collection, and SBC/RCF charge computations.
- *These estimates should be informed by the results of the pilot study, and revised accordingly, with judgement, recognizing that not all conditions of the full-scale implementation of SAYT can be replicated in the pilot study (actual changes in charges varying by cart size, and the limited level of transparency of the charges when included in a tax mailing.*
- Implementation of the Results:
  - Results are incorporated into computations of tonnage flows and impacts on staffing and operations at facilities (discussed later).
  - Results are used in computations of changes in the trash service needed by households under the SAYT system (discussed in next section).
  - Results are used in computations of the various elements of charges for solid waste services, including a new varying SBC that incorporates the SAYT volume-based incentive (discussed later).

**How Recommendation affects Households:**

- Variable pricing encourages households to set out less trash for collection, and more in other containers. They are also encouraged to make different decisions at the grocery store, and where possible, consider repairing items rather than disposing / replacing.
- Households putting out less trash pay less.

**How Recommendation affects Haulers:**

- Haulers will likely reroute for less trash tonnage per household.
- County will likely reroute recycling for more tonnage per household.

**How Recommendations affect Facilities:**

- Less tonnage and revenue related to trash; more in the recycling and composting streams. Details on these effects are included in a specific discussion later in the report. In addition, right sizing cart selection, real-time monitoring of curbside collection routes and increased education and enforcement all reduce the potential increase in contamination of the recyclable stream.

**How Recommendation affects the County:**

- Finances will change, resulting from fewer trash tonnage and higher recycling and composting tonnage.
- The tonnage losses in trash will exceed the increases in recycling and composting in the amount of new waste reduction / source reduction. This will have additional impacts on the County finances.
- County outreach will need to focus strongly on emphasizing the relationship between service level and costs to households in order to establish the critical financial incentives for the SAYT program.

<sup>26</sup> The analyses and options considered in this report are based on extensive review of the literature and lessons and information from the many case studies embedded in reports and articles and the consultant team’s working experience with other SAYT communities across the US and Canada. Many of these communities are identified throughout this report.

<sup>27</sup> Using the multi-year average data provided by Montgomery County.

**Timing:**

Calculations are provided up-front to drive the remaining analyses. Changes in tonnages occur fairly rapidly as the incentives for behavioral changes.

The consultants considered the overall program design for the recycling and yard trim options, and the likely level of the incentives to be reflected to the households as part of the computations. Key factors affecting the projected tonnage that would be diverted in Montgomery included:

- The County’s high existing recycling rates, and its high capture rates, especially in the yard waste stream.<sup>28</sup>
- The County has convenient recycling and diversion options.
- The County has an aggressive outreach program, promoting diversion.
- The price incentive for the County’s SAYT system will be an unusual form. Most communities or haulers bill fairly visibly on a monthly, bimonthly, or quarterly bill, either separately for solid waste service alone, or on a combined utility bill, clearly identifying the solid waste components. The County’s system will be charging for SAYT service via its System Benefit Charge (SBC) which is a component in an annual tax bill. The unusual nature of this incentive made it difficult to rely entirely on information from other jurisdictions<sup>29</sup>. The County’s structure differs from the traditional SAYT systems in several ways:
  - Annual, rather than more frequent, billing has two effects. While the savings will look larger (12 times larger than a monthly bill), the relationship between payment and service level occurs far less frequently (only once a year).
  - Inclusion in a combined bill makes the signal less visible. The relationship between the SAYT services (solid waste services) and the bill will not be as clearly visible on Montgomery County’s “bill” as it is in other jurisdictions. This also reduces the incentive / behavior change link. It will be important that the outreach program make this volume and cost relationship clear to households to encourage the desired behavior.

The traditional expectation for diversion in a community is 17-18 percentage points of new diversion<sup>30</sup>, with about a third going to, respectively, recycling, organics, and new source reduction (SR). These estimates were decreased for the work in Montgomery County because of: high existing capture in yard trim which capped the amount that could be diverted from yard trim; and high capture for recycling, which also limited the amount of diversion for recycling. It was assumed that aggressive outreach could help make sure the message on source reduction was as successful as it has been in other communities. This aggressive messaging is discussed in a later section. The resulting tonnage estimates are provided below.

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<sup>28</sup> *Montgomery County has a dual stream recycling program, meaning its two recycling facilities are set up to receive and process fiber products and containers separately. The Project Team did not evaluate switching to a single stream program, as it is assumed the County will continue to operate a dual stream program, according to the “Aiming for Zero Waste” report, section 11.1.*

<sup>29</sup> *Toronto, Ontario charges a SAYT solid waste fee with the annual property taxes. The City also has a solid waste charge that is billed with water approximately every three months. Toronto did see an increase in diversion when the SAYT system was implemented, however this change was rolled out with multiple diversion increasing programs, so it is difficult to say how much of the diversion was attributed to SAYT alone.*

<sup>30</sup> *Econservation Institute 2015.*

**Figure 2.1: Current and New Annual Diversion**

	SD A	SD B	Countywide
Total new tons diverted and reduced	57,249	59,278	116,527
Total new capture rate	84%	73%	78%
Additional new recycling capture rate	16%	15%	15%
Total new recycling capture rate	86%	73%	78%

*Table Note: The total new diversion percent is 43%. This information can be found in the model on tab “Results – Captured Tons.” The consultants also developed an alternate scenario for the effectiveness of the SAYT program assuming the diversion incentive is less effective. This alternate scenario estimates a new total capture rate of 75% and a new diversion rate of 41%.*

The specific calculation steps are included in the spreadsheet model provided with this project. These data were transferred to the other steps and used in developing the SAYT program design recommendations and implementation plan.<sup>31</sup>

### 2.A.3 Assessing Extra Environmental Benefits from SAYT – GHG Effects and their Valuation

SAYT incentivizes reductions in trash disposal and increases in recycling, composting, and waste reduction. There are nationally vetted models that help quantify the change in greenhouse gas (GHG) emissions, specifically metric tons of carbon dioxide equivalent (CO<sub>2</sub>e), which is easily valued using CO<sub>2</sub>e prices from EPA, the White House, or Stanford research values per metric ton.

GHG emission effects vary based on the material. Aluminum recycling avoids enormous emissions per ton; other materials (particularly yard waste) are more modest. The estimates presented below are a conservative estimate of the GHG tons and, consequently, the dollar value. This is because a substantial amount of the effects of SAYT is waste reduction (WR). This encompasses repair and reuse, careful purchasing, less packaging and a wide variety of other effects. The difficulty is that there is no published waste composition indicating the percent of WR tons by specific materials affected, and WR materials are not a match for recycled materials. WR likely includes some reduction in electronics, or furniture, or myriad other materials that are repaired rather than disposed; however, no information on this composition is available to populate the vetted models. Any estimates would be ad hoc assumptions.

Therefore, the consultants took the conservative approach of only estimating the GHG associated with the materials diverted via recycling and composting; the WR tons are treated simply as never being disposed. This number results in greater GHG reductions than treating the WR tons as still landfilled, but lower than if the WR tons are treated as recycled tons (emphasizing the packaging aspects of WR). It is likely that the reuse / repair effects can also result in strong GHG effects.

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<sup>31</sup> *The food scraps pilot was underway at the start of this project. The County determined that the SAYT study should not include assumptions or consideration of a food collection program. Note, if the County determines to introduce SAYT with or after county-wide introduction of a food scraps program, the modeled results do not incorporate incremental tonnage, cost, or other impacts that would arise when a food scraps program is in place. Recall also that it is far better to implement the food scraps program before or concurrent with the SAYT program; it will not work to implement the SAYT program, and then shortly after, implement the food scraps program. The disruptive effects on carts and household decision-making will cause a significant backlash and significant extra costs from mis-ordered / delivered carts.*

These conservative GHG tons are valued using the three main market valuation figures. EPA is particularly conservative, but is widely used and is a benchmark, and the White House<sup>32</sup> figures are slightly higher. The most aggressive, from a Stanford study, quantifies a much wider range of climate impacts than the other studies<sup>33</sup>.

**Recommendation related to Estimated Value of Avoided Greenhouse Gas (GHG) Emissions from SAYT in Montgomery County** → A conservative estimate of the Metric Tons of Carbon Dioxide equivalent (MTCO<sub>2e</sub>) emissions avoided due to SAYT is 46,396, MTCO<sub>2e</sub> per year. The annual dollar value of these reductions range from \$2,864,516 to \$13,065,235 per year, depending on the market value used. This value represents additional environmental benefits attributable to the implementation of SAYT and are often used by communities to compute more enhanced benefit-cost ratios.

**Elements / Steps to develop this estimate included:**

- The consultants used the tonnage change figures for Subdistrict A and B computed earlier in the study.
- Consultants use the EPA WaRM™ model, running a base case reflecting the total of the diverted tons as “mixed MSW” in the base case, and assigning the diverted tons into their appropriate material categories in the “after” case. The EPA model provides an estimate of the MTCO<sub>2e</sub> from this transfer of materials from the landfill to recycling, composting, and waste reduction.
- Consultants multiply the MTCO<sub>2e</sub> results times the alternative market values – EPA, White House, and Stanford, for use in assessing the quantity of GHG avoided, and its potential value, based on published valuations.<sup>34</sup>
- *These estimates should be informed by the tonnage impacts realized in the pilot study, and the GHG computations should be revised accordingly, with judgement, recognizing that not all conditions of the full-scale implementation of SAYT can be replicated in the pilot study.*<sup>35</sup>

**Implementation of the Results:**

- Results are reported in MTCO<sub>2e</sub> and dollar terms, to help the County quantify the environmental effects of implementing the SAYT program and enhance the reporting of benefits and costs.

**How Recommendation affects Households:**

- No effect.

**How Recommendation affects Haulers:**

- No effect.

**How Recommendations affect Facilities:**

- No effect

**How Recommendation affects the County:**

- The additional information may allow a more enhanced review of benefits and costs from the SAYT program to support decision-making about the program.
- County outreach will need to focus strongly on emphasizing the relationship between service level and costs to households in order to establish the critical financial incentives for the SAYT program.

<sup>32</sup> White House – [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf); Stanford – <https://news.stanford.edu/2015/01/12/emissions-social-costs-011215/>

<sup>33</sup> *The most commonly monetized portion of the environmental effects is emissions. The translation of changes of tons landfilled (not used productively) to recycled, composted, or reduced, into changes in GHG is readily modeled using the Environmental Protection Agency’s (EPA) WaRM model. The value of the changes in metric tons of carbon dioxide equivalents has been estimated in multiple studies, allowing monetization of the changes in emissions.*

<sup>34</sup> *The consultants also developed a less aggressive scenario for the effectiveness of the SAYT program. Less aggressive tonnage reductions result in 32,744 avoided MTCO<sub>2e</sub> per year with values of \$2,021,628 to \$9,220,770, depending on the valuation source used.*

<sup>35</sup> *For example, actual changes in charges varying by cart size, and the limited level of transparency of the charges when included in a tax-related billing.*



**Timing:**

Calculations are provided up-front to drive the remaining analyses. Changes in tonnages occur fairly rapidly as the incentives for behavioral changes.

Figures 2.3 and 2.4 show the computation steps and resulting valuations of the reductions in greenhouse gas (focused on metric tons of carbon dioxide equivalent) that are estimated to result from a County-wide roll-out of a SAYT program in Montgomery County, Maryland. The dollar valuations (conservative or aggressively-valued) can be defensibly included in a benefit-cost equation for the strategy.

**Figure 2.3: Incremental GHG Emission from Recycling and Composting (MTCO<sub>2</sub>e)**

Outputs from WARM_v15.1	Reduction in MTCO <sub>2</sub> e from recycling and composting from SAYT
Total GHG Emissions from Baseline MSW Generation and Management (MTCO <sub>2</sub> e) <sup>36</sup> :	0.01
Total GHG Emissions from Alternative (Recycling and Composting) MSW Generation and Management (MTCO <sub>2</sub> e):	-1.57
<b>Subtotal:</b> Incremental GHG Emissions from Recycling and Composting (MTCO <sub>2</sub> e):	-1.58
Incremental tons (recycling, composting, SR) <sup>37</sup>	29,314
<b>Result:</b> Incremental reduction in MTCO <sub>2</sub> e from recycling, composting, and SR from SAYT	46,396

**Figure 2.4: Value of MTCO<sub>2</sub>e Reduction from Recycling, Composting, and Source Reduction from SAYT**

	MTCO <sub>2</sub> e Value in 2023 Dollars	Incremental reduction in MTCO <sub>2</sub> e from recycling, composting, and SR from SAYT	Countywide value of MTCO <sub>2</sub> e reduction from recycling, composting, and SR from SAYT
Recycling, Composting, SR		46,396	
EPA <sup>38</sup>	\$61.74		\$2,864,516
White House	\$88.64		\$4,112,543
Stanford	\$281.60		\$13,065,235

## 2.B Modifying and Synching Trash and Recycling Collection and Contracting

This section of the report outlines the implementation plan for the changes to trash and recycling collection and hauler contracts involved in delivering the new SAYT program in Montgomery County, Maryland. Note that a complexity in bringing SAYT to the County is that there are a number of existing contracts that will need to expire before the program can be introduced; the current contracts do not provide for early termination or change.

<sup>36</sup> Montgomery County reported factor for combustion is 0.01.

<sup>37</sup> See Appendix B: Tonnage Calculations.

<sup>38</sup> EPA – [https://www.epa.gov/sites/default/files/2016-12/documents/social\\_cost\\_of\\_carbon\\_fact\\_sheet.pdf](https://www.epa.gov/sites/default/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf); White House – [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf); Stanford – <https://news.stanford.edu/2015/01/12/emissions-social-costs-011215/>



The first section below addresses the changes to the existing contracting for trash collection in Subdistrict A; the second section discusses the implementation plan for Subdistrict B.

### 2.B.1 Modified Contracted Trash and Recycling Service in Subdistrict A

In Subdistrict A, Montgomery County has existing hauler contractors that provide trash service. The implementation plan for collection service for the SAYT in this Subdistrict is provided below.

**Recommendation for Trash Service Provision in Subdistrict A** → Trash Service in Subdistrict A is continued with County Contracts with private haulers assigned to each of 3 Service Regions in Subdistrict A.

Elements / Steps include:

- County conducts public information session with all interested residents and haulers to discuss the timing and implementation of a change in trash collection to a SAYT program. Specify roles for who will be responsible for developing material and conducting public information sessions. This session would provide background on the SAYT program elements including:
  - variable sized carts,
  - timing of implementation (this could be coordinated with the timing of the recycling contracts),
  - designation of service areas and routes (consolidating 6 Service Areas into 3 Service Regions),
  - billing system information, and other information based on the SAYT recommendation.
  - Identify and define barriers to contracting with haulers

**Timing: Completed within 2 months after adoption of Chapter 48 amendments.**

- County seeks approval through Council action to issue RFPs for service in Subdistrict A to adopt the SAYT variable based waste and recycling cart collection services. Council would hold at least one public hearing as required under the Council’s Rules of Procedure. County would target implementation at the end of service contracts in 2025 and would need to seek extension of one contract ending in 2024 with all other extensions ending in 2025. Implementation would begin at the end of existing terms. County would renegotiate contracts that have end dates that do not expire in 2025. The County will consolidate service areas into collection regions to allow achieve more competitive pricing responses from bidders.

AREA	Trash and Recycling Contractor	CONTRACT ENDS
CSA-1	UNITY	4/29/2024+1
CSA-2	UNITY	3/4/2024+1
CSA-3	BFI	6/8/2024+2
CSA-4	UNITY	4/29/2024+1
CSA-5	UNITY	7/1/2023+2
CSA-6	ECOLOGY	7/17/24

**Timing: 60-90 days.**

County prepares a competitive RFP for 6 Service Areas<sup>39</sup>, with a preference for consolidating 2 Service Areas into Service Regions, within Subdistrict A; unequal numbers of households in each area. RFP specifications include<sup>40</sup>:

- Term of 5 years with ability to extend annually for up to 2 more years.

<sup>39</sup> The designation of 6 service areas depends on the County’s preference to allow more haulers – specifically small haulers – to be awarded competitive contracts.

<sup>40</sup> For best practices for contracts with MRFs, reference this resource from The Recycling Partnership: <https://recyclingpartnership.org/MRF-Contracts/>

- Specifications for weekly collection of trash with 32-gallon, 64-gallon, 96-gallon carts
- Specifications for weekly collection of recycling with 35-gallon and 65-gallon carts
- Provide service with automated or semi-automated cart collection,
- Require haulers to collect pre-paid bags for trash overflow.
- Coordination of collection days with trash and recycling service,
- Bulky waste collection that allows each residential property receiving Montgomery County provided trash collection service 2 scheduled bulk trash collections per calendar year for large items that won't fit in a regular trash can or trash bag.
- Daily reporting of tons of trash and recyclables delivered to facilities by hauler, truck number, route, date, and time with scale ticket uploaded to data system.
- Delivery of material to County-specified facilities. A penalty will be applied when the hauler exceeds a specific number of contaminated loads delivered to the recycling processing facilities.
- Enforcement of container sizes,
- Data collection with on board camera and data system with data transfers to County for customer service and enforcement purposes within first 3 months of start of services, with required training for all staff on data system.
- Ongoing contractor performance monitoring by County staff; enforcement of contract provisions,
- Ongoing invoicing / payments to contractors
- After the required notice public period, County advertises and releases the RFP widely and sends to all haulers currently known to be operating in Subdistrict A and other regional and national haulers. The County will follow RFP county procurement process.  
**Timing: RFP response within 60-day timeline.**
- County receives responses to the RFP; County scores, selects, and negotiates with most advantageous proposers. Most advantageous proposer is awarded the territory with the most households. Contract negotiations would need to be completed to meet the agreed upon timing for program implementation.  
**Timing: 30-day review and selection timeline. 90-day contract negotiation timeline.**

**How Recommendation affects Residents:**

- As a result of new contracts residents in Subdistrict A receive trash and recycling service from new haulers, with possible changes in collection day. Cart distribution for trash and recycling (container) carts would be undertaken 1 month preceding the implementation date.

**How Recommendation affects Haulers:**

- Successful proposers sign contracts and are responsible for: obtaining the required fleet of trucks to meet deadlines; implementing data integration and tracking program with County on the accounts in their territory; any other customer service requirements in the contract.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.
- County needs to provide public education to residents in Subdistrict A

**2.B.2 Contracted Trash and Recycling Service in Subdistrict B**

In Subdistrict B, Montgomery County only provides (contracted) collection for recycling. Private hauling companies provide trash service. The steps involved in transforming this Subdistrict’s trash collection to the design recommended for an integrated SAYT system is provided below.

**Recommendation for Trash and Recycling Service Provision in Subdistrict B** → All service areas will be managed under the same requirements as Subdistrict A. Trash Service in Subdistrict B is changed to County Contracts with winning private haulers assigned to one of 3 Service Regions sectors in Subdistrict B.<sup>41</sup>

Elements / Steps include:

- County provides the **required notice** under state and county law that it plans to implement contract for service provision in Subdistrict B via a competitive Request for Proposal (RFP) process following adoption of amendments to Chapter 48.
- County conducts public information session with all interested residents and haulers to discuss the timing and implementation of a change in solid waste collection to a contracted SAYT program that is based on the contracting approach in Subdistrict A. Specify roles for who will be responsible for developing material and conducting public information session. This session would provide background on the SAYT program elements including:
  - variable sized carts,
  - timing of implementation (this could be coordinated with the timing of the recycling contracts),
  - designation of service areas and routes (consolidating 3 Service Regions into Service Regions),
  - billing system information,
  - Identify and define barriers to contracting with haulers,
  - other information based on the current service model in Subdistrict A.

**Timing: Completed within 2 months after adoption of Chapter 48 amendments.**
- County seeks approval through Council action to issue RFPs for trash service in Subdistrict B to adopt the SAYT variable based cart waste and recycling collection services based on Stakeholder process. Council would hold at least one public hearing as required under the Council’s Rules of Procedure. County would target implementation of trash contracts in 2025 and would need to. Recycling renegotiates contracts that have end dates beyond 2025 to align all contracts with the same service contracts throughout the County. If recycling contracts cannot be renegotiated, then trash contracts may need to be modified to coincide with expiration of recycling contracts and the rebid in 2028. The County will renegotiate to open recycling contracts so waste and recycling contracts can be simultaneously implemented. The County will consolidate service areas into collection regions (See Appendix E: Feasibility Analysis with proposed regions) to allow achieve more competitive pricing responses from bidders.

AREA	RECYCLING CONTRACTOR	RECYCLING CONTRACT ENDS
AREA-7	BFI	7/1/2023+2
AREA-8	ECOLOGY	6/5/24
AREA-9	UNITY	10/27/26+2
Area-10	UNITY	12/06/26+2
AREA-11	UNITY	10/29/26+2
AREA-12	UNITY	10/27/2026+2
AREA-13	UNITY	10/27/2026+2

- Consolidate 7 Service Areas into 3 Service Regions provide recommendation and rationale.
- County prepares a competitive RFP for 3 Service Regions within Subdistrict B unequal numbers of households in each area. Services in Subdistrict B will be the same as Subdistrict A. RFP specifications covering specifications related to SAYT program (other standard specifications such as safety to meet all of government goals as currently defined not identified) include:

<sup>41</sup> Certain County labor protection laws – including requirements for wages, labor peace agreements, and displaced workers – apply only to employees of trash haulers under County contracts. Expanding Subdistrict A requirements to the entire residential service areas in the County would extend these local protections to more trash collection workers. *Trash and Recycling Collection: An Evaluation of Current Policies, Montgomery County Office of Legislative Oversight, Report 2019-17, November 12, 2019*

- Term of 5 years with ability to extend annually for up to 2 more years.
- Specifications for weekly collection of trash with 32-gallon, 64-gallon, 96-gallon carts
- Specifications for weekly collection of recycling with 35-gallon and 65-gallon carts
- Provide service with automated or semi-automated cart collection,
- Require haulers to collect pre-paid bags for trash overflow.
- Coordination of collection days with trash and recycling service,
- Bulky waste collection that allows each residential property receiving Montgomery County provided trash collection service 2 scheduled bulk trash collections per calendar year for large items that won't fit in a regular trash can or trash bag.
- Delivery of material to County-specified facilities,
- Daily reporting of tons of trash and recyclables delivered to facilities by hauler, truck number, route, date, and time with scale ticket uploaded to data system.
- Data collection with on board camera and data system with data transfers to County for customer service and enforcement purposes must be fully implemented within the first 3 months of start of services, with required training for all staff on data system,
- Ongoing contractor performance monitoring by County staff; enforcement of contract provisions,
- Ongoing invoicing / payments to contractors
- After the required notice public period, County advertises and releases the RFP widely and sends to all haulers currently known to be operating in Subdistrict A and other regional and national haulers. The County will follow RFP county procurement process.  
**Timing: RFP response within 60-day timeline.**
- County receives responses to the RFP; County scores, selects, and negotiates with most advantageous proposers. Most advantageous proposer is awarded the territory with the most households. Contract negotiations would need to be completed to meet the agreed upon timing for program implementation.

**Timing: 30-day review and selection timeline. 90-day contract negotiation timeline.**

**How Recommendation affects Residents:**

- Residents in Subdistrict B receive trash and recycling service from new haulers, with possible changes to collection day. Cart distribution for trash and recycling (container) carts would be undertaken 1 month preceding the implementation date.
- Residents are billed for all services through their tax statements.

**How Recommendation affects Haulers:**

- Successful proposers sign contracts and are responsible for: obtaining the required fleet of trucks to meet program implementation deadlines; implementing data integration program with County on the accounts in their territory; any other customer service requirements in the contract.
- Unsuccessful proposers collect any company owned containers or carts within 60 days of the end of contract.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.
- County needs to provide public education to residents in Subdistrict B

### 2.B.3 Collection Route and Truck Impacts and Costs

The Project Team modeled the trash collection for staff reduction and route reduction. The Project Team used the estimates for route reduction and the resulting total number of routes needed to collect the estimated trash tonnage under the recommended cart based SAYT program. The estimated cost incorporated the cost reduction from the truck/route reduction per day. Based on information that many of the routes have physical constraints (overhead wires or crowded street parking) that makes

automated collection unfeasible, the cost model only estimated that 20% of the trash routes under the automated cart scenario would be fully automated and the remaining routes would be semi-automated. The recycling route data for Subdistrict B was used to model refuse collection impacts in Subdistrict B. The Project Team also assumed that for the semi-automated and fully automated routes, new trucks would need to be purchased.

As with the trash routes, the estimate of the tons per day per route was used as the basis to determine whether the increase in the recycling tons collected under the SAYT program. Based on the number of routes per day for every day of the week, the Project Team estimated the current total tons per day of recyclables collection for each route day. This was used to calculate the increase in tons per route day. The total daily tonnage was then divided by the Average Tons Per Day per Route to calculate the number of routes that would be required to collect the estimated tonnage of recyclables.

**Figure 2.5: Total Costs for Contracted Services**

	SD-A/B Status Quo	Subdistrict A + B*
Trash Collection	\$24,407,480	\$19,590,120
Commingled Materials Collection	\$5,956,420	\$6,004,570
Paper Collection	\$10,088,630	\$10,174,140
Total Recycling	\$16,045,050	\$16,178,716

\*The values for Trash Collection under a Fully Automated Collection program are based on 20% of the households receiving Fully Automated Collection. An increase in the percentage of households receiving Fully Automated Collection is assessed in the Cost Analysis in Appendix G: Cost Impacts and Analysis.

### 2.B.4 Recommendation for County Owned Cart Procurement Service Provision in All Service Areas

The County will need to purchase and distribute thousands of new carts for trash recycling service<sup>42</sup>. The implementation plan for this task is outlined below.

**Recommendation for County Owned Cart Procurement Service Provision in Subdistricts A and B** → Trash service with carts in all service areas is changed to variable sized carts<sup>43</sup> (32 gallon, 64 gallon, 96 gallon) for trash collection and an additional 35 gallon cart for recycling (containers; residents already have a fiber recycling cart) with fully automated and/or semi-automated collection.

#### Cart Procurement and Distribution

Elements / Steps include:

- Following County approval of SAYT program for Subdistrict A and B, County conducts outreach program on cart based SAYT program to inform residents of change (See Outreach and Education Program).

<sup>42</sup> In the Phase 1 Feasibility Assessment MOCO selected the continuation of a dual stream recycling collection system because the processing facilities are set up for dual stream (existing and continuing) and further supported in the Montgomery County Maryland, Aiming for Zero Waste, April 2019, Task 8: Review of Existing Processing Facilities.

<sup>43</sup> Carts were chosen over bags and stickers for multiple reasons including ongoing costs and limited availability of bags, potential risks to waste collection workers, public health and safety concerns, environmental issues related to plastic bag usage, and negative impacts on neighborhood aesthetics and litter. Carts offer a one-time cost, reduced risk of injury, and alleviate issues associated with bags such as vermin attraction and excessive plastic waste. See Appendix E: Feasibility Analysis for more information.

- County established cart selection process (see Customer Cart Choice) and allows residents to select service cart size over 6-week period.
- County prepares a competitive RFP for cart procurement and delivery and follows all County RFP procedures. Based on the timeframe of Subdistrict B inclusion in the SAYT program, the RFP could procure carts in two parts based on the contract implementation dates in each subdistrict.
- After the required notice period, County advertises the RFP widely, County releases RFP and sends to all cart manufacturers currently known, with 6 weeks for responses to RFP.
- County develops list of all addresses and cart sizes for use by contracted distribution provider.
- RFP specifications include:
  - Specifications for trash and recycling carts manufacture, delivery, assembly, distribution, and maintenance by cart contractor
  - Cart Allocation based on the current estimate, which may change based on the results of the Pilot program.

	# of Carts Ordered	32 gal (T) 35 gal (R)	64 gal	96 gal
Trash Carts A	98,150	54%	28%	16%
Trash Carts B	134,120	54%	28%	16%
Recycling Carts A and B	232,270	100%	0%	0%

- Select Cart distribution and assembly location.
- Delivery of new carts over 4-week period in each Service Area – Coordination of distribution schedule days with trash and recycling service,
- Data transfers with associated RFID tagging on container distribution to County for billing purposes,
- Payments to cart manufacturer and contracted distribution partner and contractors
- County scores, selects, and negotiates with most advantageous proposers. Most advantageous proposer is awarded the cart contract.
- County identifies location for 2 months for cart assembly and distribution.
- Contractor/manufacturers assemble and distribute carts to identified addresses.
- Ongoing contractor performance monitoring by County staff; enforcement of contract provisions,
- County identifies a new location for cart storage to accommodate increased cart inventory to service all county residents with trash and recycling carts.

**How Recommendation affects Residents:**

- Residents in Subdistrict A and B receive new carts based on the selection process. See Section Customer Cart Choice Recommendations – Implementation for cart selection and different size requests.

**How Recommendation affects Haulers:**

- Contracted haulers will provide cart-based fully-automated or semi-automated trash and recycling collection service.

**How Recommendation affects the County:**

- County staff needed to manage contractor for cart procurement, assembly, and distribution out steps above.

## 2.C Processing & Facility Impacts

This section describes the recommendations and implementation plan for managing the impacts that the SAYT’s diversion of extra materials places on the various processing and management facilities.

## 2.C.1 Processing and Disposal Site Full Implementation Recommendations

The County will need to accommodate additional forecasted tons of container and fiber recyclables at their facilities as a result of SAYT implementation, as the program will result in changes in the qualities of waste and recyclables received by the facilities. The planned capacity of the container CCL after the upgrade is completed is 25 Tons per Hour (TPH) or 45,825 tons per year (260 days per year of operation).

The Paper Facility (PPF) was designed to process 25 TPH or 45,825 tons per year but is currently processing 18-22 TPH or 43,000 tons per year (260 days per year of operation). Given the operational constraints identified at the PPF that results in a shortfall of 6-9,000 tons per year of processing capacity, the Project Team recommends incorporating an additional shift on a sixth day of the week as an alternative to building an entirely new facility to process the increase in material estimated to be collected under a SAYT program. An additional day of operations would increase the annual capacity to 51,790 tons<sup>44</sup> (166 tons per day). Additional storage capacity to hold additional days of processing of baled material is also a limiting factor.<sup>45</sup>

Adding an additional operating day, even given all the operational issues identified by facility management, seems the only viable option that does not increase operational hours per day beyond what is identified in labor agreements and labor law. The addition of a 6<sup>th</sup> processing day would need to be further evaluated to assess the impacts of single day labor availability, utility costs, processing speed and accuracy, as well as consistency of the volume of materials that must coincide with the 5 days per week collection routes and the viability of the tip floor storing material for an additional day of processing.<sup>46</sup> If it is not feasible to extend the current operations at the PPF for an additional day or additional hours of operation, then the County should consider a new facility to process paper. If the current site does not have the available area, than an alternative location will need to be identified for a new facility. Without changes in the operational capacity of the PPF then a SAYT program would be difficult to implement.

**Figure 2.6: Tonnage at the PPF**

New Total Fiber Tons (maximum)	50,400
New Total Container Tons (maximum)	28,400
Annual Processed Tons	78,800
PPF Throughput Capability	
Operating Fiber Tons per Hour	20
Shifts	1.0
Prod Hr./Shift	8.3
Working Days/Year (6 days/week)	312
Potential Annual Processed Tons	51,790
CCL Throughput Capability	
Rated Container Tons per Hour	25
Shifts	1.0
Prod Hr./Shift	7.5
Working Days/Year (5 days/week)	260
Potential Annual Processed Tons	45,825

<sup>44</sup> See Figure 2.6.  $20 \text{ tph} \times 8.3 \text{ hours} \times 312 \text{ days} = 51,790 \text{ tpy}$

<sup>45</sup> A new storage outbuilding could be constructed or baled material can be moved directly in to trailers and moved directly to market when full.

<sup>46</sup> Examples of MRFs that have similar operations include Rumpke Recycling, Columbus, OH; Republic Services Resource Recovery Authority of Southwest Oakland County (RRRASOC), Novi, MI; Eureka Recycling, St. Paul, MN (labor peace agreement); Emmet County, MI.



The following are recommendations for process changes to the processing facilities, including the paper processing facility, material recovery facility, yard trim composting, resource recovery facility, and landfill and ash management site<sup>47</sup>.

**Recommendation for Processing and Disposal Sites** → County adjusts processing and disposal facility budgets based on forecasted cost projections in following sections. County review and amend recycling processing contract to accommodate additional forecasted tons per year at the CCL/PPF. In collaboration with recycling and yard trim facility contractor(s), County review and, as needed, update procedures for CCL, PPF and yard trim contractor(s) to alert Montgomery County regarding contaminated loads of recycling and yard trim, to conduct recycling waste sorts, and to report tons of recyclables and yard trim received by hauler, truck number, date, and time. Elements / Steps to include for Changes to Processing Sites:

Paper Processing Facility (PPF)

- County notifies PPF contractor of SAYT full implementation **nine months to one year prior to full implementation**. County provides them with projected changes in tonnages and additional requested procedural changes. Contracts should be updated as detailed below, no later than **six months prior to full scale implementation**.
- County reviews and amends recycling processing contract to ensure contract allows the recycling processing contractor to operate Montgomery County's PPF for 8 hours per day for six days per week (adding an additional processing day) to accommodate up to 11,633 additional tons per year of mixed paper and OCC, as this is the most cost-effective way to process the projected 10,500 ton per year overage of mixed paper and OCC.
- County adjusts paper processing facility contract budgets based on forecasted tonnage changes and associated cost changes. It is recommended that Montgomery County's Department of Environment reevaluate additional budget needs based on current costs per ton and labor rates prior to negotiating contracts and requesting budget changes.
- The PPF contractor shall notify Montgomery County Department of Environment daily regarding loads of recyclables based upon visual inspection are deemed to consist of ≥15% contamination by weight.<sup>48</sup> Contractor shall supply the following information for the loads of recyclables that are deemed to consist of ≥15% contamination based on visual inspection: Date, time, truck number, route number, net tons, whether the load had ≥15% contamination by main contaminant, and image of contaminated load. The County would send letters to collection contractors that a load exceeded the contamination level. All collection contracts should include a penalty when the hauler exceeds a specific number of contaminated loads.
- The PPF contractor shall monthly report to the County the percent of inbound recyclables by weight disposed as residue. This includes both rejects from the presort and residue from the processed recyclables.
- To assess recycling contamination, for the first two years of the SAYT program, the PPF contractor shall conduct hand sort audits of recyclables every six months using a methodology that complies with ASTM D5231: Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste. After the first two years of the program, hand sort audits shall be conducted annually unless issues arise resulting in the need for more frequent hand sort audits.

Material Recovery Facility Comingled Container Line (CCL)

- County notifies CCL contractor of SAYT full implementation **nine months to one year prior to full implementation**. County provides them with projected changes in tonnages and additional requested

<sup>47</sup> Best practices for operating MRFs will depend on each individual MRF and its design. Both SWANA and NWRA provide a number of resources to help communities improve MRF operations. Additionally, events like the Annual MRF Operators Forum provide a venue for MRF operators to receive answers to questions and help workshop specific issues.

<sup>48</sup> The Project Team assumes the costs will be the same in all areas of the County once SAYT is implemented County wide.



procedural changes. Contracts should be updated as detailed below, no later than **six months prior to full scale implementation.**

- No changes are needed to staffing or days or hours of operation to accommodate additional tonnage of commingled containers projected to be received through SAYT full implementation.
- County adjusts CCL contract budget based on forecasted tonnage changes and associated cost changes. It is recommended that Montgomery County's Department of Environment reevaluate additional budget needs for recycling processing based on current costs per ton and labor rates prior to negotiating amendments to processing and/or disposal contracts.
- County amends contract as needed to ensure procedures include the following:
- CCL contractor shall notify Montgomery County Department of Environment daily regarding loads of recyclables that based upon visual inspection deemed to consist of  $\geq 15\%$  contamination by weight.<sup>49</sup> Contractor shall supply the following information for the loads of recyclables that are deemed to consist of  $\geq 15\%$  contamination based on visual inspection: Date, time, truck number, route number, net tons, whether the load had  $\geq 15\%$  contamination by main contaminant, and image of contaminated/rejected load. The County would send letters to collection contractors that a load exceeded the contamination level. All collection contracts should include a penalty when the hauler exceeds a specific number of contaminated loads. CCL contractor shall monthly report to the County the percent of inbound recyclables by weight disposed as residue. This includes both rejects from the presort and residue from the processed recyclables.
- To assess recycling contamination, for the first two years of the SAYT program, the CCL contractor shall conduct hand sort audits of recyclables every six months using a methodology that complies with ASTM D5231: Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste. After the first two years of the program, hand sort audits shall be conducted annually unless issues arise resulting in the need for more frequent hand sort audits.

#### Yard Trim Composting Facilities

- County notifies Yard Trim composting facility contractor(s) of SAYT full implementation **nine months to one year prior to full implementation.** County provides yard trim facility with projected changes in tonnages, which are minimal. See section Reduction in Tonnage.
- No changes are needed to contracts, procedures, staffing or days or hours of operation to accommodate minimal additional tonnage of yard trim projected<sup>50</sup> to be received through SAYT full implementation.

#### Resource Recovery Facility (RRF)

- No changes are recommended to RRF contracts upon rollout of the SAYT program. While tonnage delivered to the RRF and associated disposal costs are projected to decrease with the rollout of SAYT, a contract change is not required to realize these cost savings.
- No changes are recommended to RRF contract budgets upon rollout of the SAYT program. It is recommended that disposal data and costs be reviewed for the first 1-2 years after program roll-out prior to making significant reductions to budget allocations for disposal contracts.

#### Landfill for Ash and Waste that Cannot be Processed at the Resource Recovery Facility

- No changes are recommended to landfill contracts upon rollout of the SAYT program. While tonnage of ash delivered to the landfill and associated disposal costs are projected to decrease with rollout of SAYT, a contract change is not required to realize these cost savings.
- No changes are recommended to landfill contract budgets upon rollout of the SAYT program. It is recommended that disposal data and costs be reviewed for the first 1-2 years after program rollout prior to making significant reductions to budget allocations for disposal contracts.

#### **How Recommendation affects Residents:**

<sup>49</sup> The Project Team assumes the costs will be the same in all areas of the County once SAYT is implemented County wide.

<sup>50</sup> Projected increase in yard trim ranges from 600 tons in the aggressive scenario to 539 in the less aggressive scenario.

<ul style="list-style-type: none"> <li>Creates jobs at Paper Processing Facility, ~3,700 additional labor hours per year. No impact on resident service levels.</li> </ul>
<b>How Recommendation affects Haulers:</b> <ul style="list-style-type: none"> <li>No impact.</li> </ul>
<b>How Recommendation affects the County:</b> <ul style="list-style-type: none"> <li>PPF will need to be open for one additional day per week<sup>51</sup>. Budget changes for recycling processing, yard trim composting, scrap metal, ash disposal, and trash disposal will be needed to account for changes in forecasted tonnages through SAYT implementation. Cost and available labor will be an issue at the PPF, which must be resolved to implement SAYT.</li> </ul>

Material sales revenue is highly variable in today’s marketplace so using gross operating cost, which does not include commodity revenue, is the most consistent approach for determining marginal cost impacts. The Project Team used the cost per ton provided by the County<sup>52</sup> to calculate the total cost for processing all recycled tons as part of the total cost of collecting and processing for recyclable materials, which presumably captures the cost changes associated with upgrades at the current facilities. The total combined operating costs at the two processing facilities increases 25% to accommodate the increase in recovered material because of the SAYT program<sup>53</sup>.

**Figure 2.7: MRF Processing Cost**

	SD-A/B Status Quo	Subdistrict A + B
Tons	63,394	78,838
Commingled Materials	23,534	28,402
Mixed Paper, OCC	39,860	50,436
PPF Cost per Ton (Avg Per Ton with Revenue)	-\$39.75	-\$39.75 <sup>54</sup>
CCL Cost per Ton (Avg Per Ton with Revenue)	\$217.48	\$217.48
Annual Operating Cost – Commingled Processing	\$5,118,000	\$6,177,000
Annual Operating Cost – Paper Processing	-\$1,584,000	-\$2,005,000
Waste Sorts		\$260,000
Total Annual Operating Cost	\$3,534,000	\$4,432,000

### 2.C.2 Modifying Bulky Waste Pickup and Drop off Options Recommendations – Implementation

Offering the right balance of cost-effective and convenient options for bulky waste disposal will help mitigate illegal dumping, while encouraging residents to be mindful about consumption habits and can promote repair and reuse options. Decreasing the number of bulky waste pickups and eliminating free

<sup>51</sup> A new storage outbuilding could be constructed or baled material can be moved directly in to trailers and moved directly to market when full. Adding an additional operating, even given all the operational issues identified by facility management, seems the only viable option that does not increase operational hours per day beyond what is identified in labor agreements and labor law. The addition of a 6th processing day would need to be further evaluated to assess the impacts of single day labor availability.

<sup>52</sup> FY21 Annual Average Unit Cost-SECTION I – Results & Methodology 2-18-2022

<sup>53</sup> Calculations provided in the accompanying model.

<sup>54</sup> The Project Team assumes the costs will be the same in all areas of the County once SAYT is implemented County wide.

trash drop off options can result in financial and operational efficiencies for Montgomery County. Since Subdistrict B was not previously receiving a consistent level of service due to multiple trash contracts not managed by the County, the Project Team recommends writing bulky waste pickup requirements into the hauler contract(s).

**Recommendation for Modifying Bulk Waste pickup and drop off options for households in both Subdistricts during Implementation** → County phase out current practice of up to five free bulky waste pickups on request for Subdistrict A and move toward two times a year (spring and fall) bulky waste pickups on a schedule<sup>55</sup> in all areas. Discontinue free trash drop off at Shady Grove Transfer Station and Poolesville Beauty Spot. Additional charge (use prepaid stickers) for extra bulk material or material can be taken to TS for extra charge (prepaid).

Elements / Steps include:

- County includes bulky waste pickup recommendation as stipulation in hauler RFP.
- County build information on bulky waste pickup service into SAYT web page. Update each year based on the schedule below. When pickups move to a schedule, provide schedule on web page.
- County provides education to households via mailer about bulky waste pickup options at beginning of years one, two, and three. From year three onward, provide information to household via mailer six weeks before scheduled pickup.
- County moves toward bulky pickups 2x/year in Subdistrict A by beginning the phase-down process in year two of SAYT implementation.
  - In **year one of implementation**, provide status quo (up to 5x/year by request) service to both Subdistricts. County begins to limit amount of material households can put out for bulky waste pickup.<sup>56</sup>
  - In **year two of implementation**, provide 2x/year by request and 2x/year scheduled service to both Subdistricts.
  - In **year three of implementation**, provide 2x/year (spring and fall) scheduled service to both Subdistricts.
  - **After year three (ongoing)**, continue 2x/year (spring and fall) scheduled service to both Subdistricts.
- County discontinues free trash drop off at Shady Grove Transfer Station and Poolesville Beauty Spot. This practice negates the behavior change benefits of a SAYT incentive program. Notify residents of change when providing information on what to do with excess trash (see section Mitigating Overflowing Containers). Build information on change into SAYT website. Ensure staff at both locations are properly educated on changes to service and can refer residents to web page for excess trash options.

**Timing: First year of implementation**

**How Recommendation affects Residents:**

Residents in both Subdistrict A and Subdistrict B will have options for disposing of bulky waste. Residents will be able to access bulky waste schedule on SAYT web page. Residents will be notified ahead of bulky waste pickups. Residents will understand options for disposing of excess trash that do not include free drop off at County facilities.

**How Recommendation affects Haulers:**

- Hauler will provide bulky trash pickups as described to both Subdistricts.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.
- County will need to educate residents in Subdistrict A and Subdistrict B on excess trash options and bulky waste pickup schedule.

<sup>55</sup> Recommendation for scheduled pickup 2x/year is most efficient, easiest to track and easiest to plan around. The other option is to reduce by-request pickups from 5x/year to 2x/year.

<sup>56</sup> Suggested limitation for bulky waste set out is less than 10 CY per Household per set out. This equates to roughly 150 pounds of material (dependent on items) or a pile that is 8 feet long, 6 feet wide, and 6 feet tall. Residents should be able to drop off additional material at the TS for an added fee.

- County will need to keep web page up to date with bulky waste pickup schedule.
- County will build bulky waste service into hauler RFPs.

There is no change in the estimated quantity for bulky wastes, so no cost impacts were related to changes in bulky waste collection, which are incorporated into the costs for Refuse Collection & Related Administration.

## 2.D Mitigating Effects

One of the most common issues raised when a SAYT program is proposed is the laundry list of possible negative effects that the system may encourage. Mitigation strategies and recommended implementation steps are provided for each major concern:

- addressing possible increases in contamination of the recycling stream;
- managing possible increases in litter and illegal dumping;
- developing options for occasional extra waste that overflows from the sized containers;
- strategies to address non-payment for service; and
- possible strategies for helping mitigate financial burdens on low-income or vulnerable customers.

Appropriate strategies were developed for each concern. Each is addressed in turn in the sections below.

### 2.D.1 Mitigating Recycling Contamination Recommendations – Implementation

One of the biggest concerns for communities implementing SAYT is that residents will produce trash in excess of their chosen cart capacity and will use their recycling bin as an additional trash can, leading to an increase in contamination in the recycling streams. Similar to how Montgomery County has tackled contamination issues previously, a multi-pronged approach of general education (outreach to the public as a whole), targeted education (cart tagging), and enforcement will help mitigate contamination issues.

#### **Recommendation for mitigating recycling contamination in both Subdistricts during Implementation →**

County maintain up-to-date recycling information, continue cart-tagging program, and implement consequences for repeat offenders.

Elements / Steps include:

- The County should continue robust education on what is and is not recyclable. See Education and Outreach recommendations for more details, but the main recommendations are:
  - County website includes easy-to-find and updated information on how to recycle properly
  - County translates outreach material to include Spanish and Mandarin at a minimum
  - County work with contracted hauler to make sure hauler website is updated with proper recycling information
  - County ramp up Recycling Volunteer and Block Captain programs
  - County replaces aging stickers/labels on recycling carts as needed

#### **Timing: 6 months prior to implementation and ongoing throughout**

- The County should continue its cart-tagging “oops tag” program for households with noticeable recycling contamination. See Tracking Recommendations for more information on metrics and tracking procedures associated with contamination.

- County update “oops tags” with most identified recycling contaminants and include clear information on household’s main contamination issue given feedback from CCL and PPF
- County works with contracted recycling haulers to keep “oops tags” in truck for obvious contamination issues and records service address and takes photo of contamination when hauler is running its normal routes
- County works with CCL/PPF to receive information on most common contaminants in recycling stream. This information will help tailor education and outreach efforts
- County works with DEP enforcement officers to monitor neighborhoods for contamination by lifting lids and placing “oops tags”; records address and takes photo

**Timing: Ongoing throughout implementation.**

- County implement penalties by issuing notice of violation and eventual citation with fines for households who continue to place contaminants in their recycling carts.
  - For households who have had two “oops tags”, County issue notice of violation with information about fines
  - For households who continue to place contaminants in their recycling carts, County issues fine to household
  - County maintain procedures in place for resident appeals; if needed, County can take offender to District Court to settle case

**Timing: Ongoing throughout implementation.**

**How Recommendation affects Residents:**

- Residents will have a clear understanding of what is and is not recyclable in Montgomery County. Residents will receive information on improper recycling through “oops tags”. Residents will understand that continuing to recycle improperly will result in notice of violation and eventual citation with fine. Current fines range from \$150-700/day, dependent on violation type.

**How Recommendation affects Haulers:**

- Haulers will need to be proactive in flagging any obvious contamination via “oops tags” and reporting to County with this information.

**How Recommendation affects the County:**

- County will need to implement education and outreach recommendations in section Education and Outreach to mitigate contamination and make sure residents know what is and is not recyclable.
- County will need to track notice of violation at service addresses.
- County will need to work with DEP enforcement team to examine recycling carts in neighborhoods to lift lids and tag contaminated carts.
- County will need to work with CCL/PPF to identify most common contaminants.
- County continues current procedures for residents to appeal citation.

No costs impacts were included related to Mitigating Recycling Contamination but are incorporated into the costs for Enforcement and Education.

## 2.D.2 Mitigating Litter and Illegal Dumping Hotspot Recommendations – Implementation

Although a concern, SAYT does not typically have much influence on illegal dumping amounts once the program is implemented<sup>57</sup>. There are a number of best practices and strategies included in Appendix F: Mitigating Negative Effects of this report, but the Project Team recommends deterring litter and illegal dumping by addressing overflowing containers, collecting litter data to focus cleanup efforts, and continuing to provide bulky waste pickup, but at a reduced frequency.

<sup>57</sup> See evidence presented in Appendix F: Mitigating Negative Effects.

**Recommendation for Mitigating Litter and Illegal Dumping in both Subdistricts during Implementation →**

County implement plan to address overflowing containers. County collect data on litter and illegal dumping hotspots in neighborhoods to focus volunteer cleanup efforts. County implements right balance of cost-effective and convenient bulky waste disposal options.

Elements / Steps include:

- Overflowing trash and recycling containers can be a source of litter, and the County should implement recommendations to address overflowing containers (in section Mitigating Overflowing Containers). The recommendations include:
  - Providing guidance for rightsizing containers
  - Providing pre-paid stickers for excess trash
  - Enforcing proper container capacity with warnings and eventual fines
  - Providing education and outreach on the impacts of overflowing containers and how to handle excess trash

**Timing: Ongoing throughout implementation**

- County creates web form (in addition to residents being able to call MC311) on SAYT web page where residents can report litter and illegal dumping hotspots in their neighborhoods. Having data on where the litter and illegal dumping hotspots are key to ensuring quick and focused cleanup. Web form should collect: address of the hotspot, estimated size of the hotspot (small/medium/large), and date it was noticed. Map litter and illegal dumping hotspots based on addresses provided to see where the majority of hotspots are and focus cleanup efforts there. Conduct outreach notifying residents of litter and illegal dumping form as recommended in the section on Education and Outreach.

**Timing: One month before program implementation**

- County and County departments partner with grassroots organizations and other County agencies (Police Department, Housing and Community Affairs) to provide information on data hotspots to inform volunteer cleanup efforts.
  - Take before and after pictures of littered/dumped areas to use for social media and outreach campaigns.

**Timing: Ongoing throughout implementation**

- County provides convenient and cost-effective method to dispose of bulky waste. Bulky waste is waste that does not fit in a trash cart (furniture, large scrap plastic, mattresses, etc.), which can lead to it being illegally dumped.
  - See section Modifying Bulky Waste for implementation recommendations to decrease free bulky waste pickups from up to five times pickups per year as requested to two pickups per year on a schedule.<sup>58</sup>
  - County provides education and outreach to households about upcoming bulky waste pickup with a mailer sent to each household.

**Timing: Ongoing throughout implementation**

**How Recommendation affects Residents:**

- Residents in both Subdistrict A and Subdistrict B will receive information on steps to take to dispose of occasional excess trash and guidance on rightsizing their cart.
- Residents will be able to report litter hotspots and find information on bulky waste pickup through County SAYT web page.
- Residents will be notified ahead of 2x/year bulky waste pickup.

**How Recommendation affects Haulers:**

- Hauler will monitor and track overflowing containers or additional non-compliant trash setouts.
- Hauler will provide 2x/year bulky trash pickup to both Subdistricts.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.

<sup>58</sup> Recommendation for scheduled pickup 2x/year is most efficient, easiest to track and easiest to plan around. The other option is to reduce by-request pickups from 5x/year to 2x/year.

- County will need to educate residents in Subdistrict A and Subdistrict B on excess trash options, bulky waste pickup schedule, ways to report litter/illegal dumping hotspots.
- County will need to keep web page up to date with bulky waste pickup schedule and create form for reporting litter.

No cost impacts were included related to mitigating illegal dumping but are incorporated into the costs for Enforcement and Education.

### 2.D.3 Mitigating Overflowing Containers Recommendations – Implementation

One concern communities have about implementing SAYT is that residents will choose a cart size that is too small for them and will often put out too much trash, leading to overflowing containers. This is not only unsightly but can also cause rodent and litter issues. However, there are times – perhaps around the holidays or if they had a large social gathering – when a resident might have occasional excess trash that does not warrant a larger permanent trash container. Addressing this issue takes a combination of education, enforcement, and having methods of addressing excess trash. The Project Team recommends using stickers<sup>59</sup> for purchase so that residents can indicate they are putting out excess trash that has already been paid for.

**Recommendation for Overflowing Containers in both Subdistricts during Implementation** → County to provide stickers for purchase at retail outlets for additional trash beyond cart capacity. Residents will affix sticker on their own trash bag (32 gallons or smaller) and place bag next to their trash cart for pickup.

Elements / Steps include:

- County confirm sticker type, size and design to provide mechanism for residents to use for occasional trash capacity to mitigate overflowing containers. Sticker design should include:
  - County logo
  - Bag size restriction (bag must be 32 gallons or smaller)
  - Resident instructions (place bag next to trash cart on pickup day)
  - Sticker should be brightly colored and easy to see from trash truck

**Timing: 1 year prior to program implementation.**

- County confirms pricing for residents (\$3.50-4.00 per sticker is recommended). County purchase stickers.

**Timing: 11 months prior to program implementation**

- County provides haulers with information on pre-paid stickers and require haulers to collect bags with stickers, as included in the RFP (see sections Modified Contract Trash and Recycling Service in SD A and Contracted Trash and Recycling Service in SD B).

**Timing: Include in RFP when going out for bid for contracted trash service.**

- County starts reaching out to recommended retail partners (local grocery stores, convenience stores, County office, trash hauler office) to sell stickers. County negotiates the recommended retailer commission (10 percent is recommended). County set up contracts for participation, invoicing system, and payment system. To keep invoicing as simple as it can be, it is recommended to choose retail/and or hauler partners the County already does business with and keep the number of partners limited but still accessible.

**Timing: 9 months prior to program implementation.**

- County includes information about pre-paid stickers for excess trash in initial outreach to residents about SAYT. Build info into SAYT program webpage, including locations where and when residents can buy stickers.

**Timing: 6 months prior to program implementation.**

<sup>59</sup> Other communities that utilize stickers for excess trash include Austin, TX and Golden, CO.



- County distributes stickers to retail and/or hauler partners to start selling to residents.  
**Timing: 3 months prior to program implementation.**
- County provides residents with education about the impacts of overflowing containers and how to manage their extra trash. Provide residents with information on how to upsize their trash cart (see section Cart Choice recommendations).  
**Timing: Ongoing throughout program implementation.**
- Retail/hauler partners provide County with quarterly report of how many stickers are sold and how many they have left. County maintains inventory of additional stickers for retail/hauler partners.  
**Timing: Ongoing throughout program implementation.**
- Start enforcing overflowing container management with warnings via “oops tags”, coupled with additional education for the household. Ensure haulers have information and leave-behinds (“oops tags”) for enforcement purposes.  
**Timing: 6 months into program implementation.**
- For repeat offenders, County implements penalties by issuing notice of noncompliance and eventual citation with fines for households who continue to place overflowing containers on the curb.
  - For households who have had two “oops tags”, County issues notice of noncompliance with information about fines
  - For households who continue to place overflowing containers out, County issues fine to household
  - County maintains procedures in place for resident appeals; if needed, County can take offender to District Court to settle case

**Timing: Ongoing throughout implementation.**

**How Recommendation affects Residents:**

- Residents in both Subdistrict A and Subdistrict B will receive information on steps to take to dispose of occasional excess trash.
- Residents will be able to get answers to their questions through webpage and other outreach material.
- Residents will understand why they are issued a warning or fine for an overflowing container.
- Residents will understand how to upsize their trash cart.

**How Recommendation affects Haulers:**

- Hauler offices can serve as a retail outlet for pre-paid stickers for excess trash.
- Hauler will need to train their staff on excess trash procedures (e.g., to collect only bags that have a specific sticker affixed to them).

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County will need to educate residents in Subdistrict A and Subdistrict B on excess trash options.
- County will need to design and purchase stickers and work with retail outlets to sell these.
- County will need to keep inventory of additional stickers available to retail partners.

**Impacts on Retail Partners:**

- Retail partners (local grocery stores, convenience stores, County office, trash hauler office) will need to train their staff on how to sell stickers to residents asking for them.
- Retail partners will need to enter into a contract with County to sell stickers.
- Retail partners will need to report quarterly to the County on number of stickers sold and stickers remaining.

No costs impacts were included related to mitigating illegal dumping but are incorporated into the costs for Enforcement and Education and are assumed to also be included in costs for collection services as stipulated in contractual agreements.

## 2.D.4 Mitigating Nonpayment Recommendations – Implementation



Montgomery County’s current process of handling nonpayment or late payment of a homeowner’s tax bill, which includes the Systems Benefit Charge (SBC) and Refuse Collection Fund (RCF) for solid waste management, is to charge both interest and a penalty for late payment of their property tax bill<sup>60</sup>. Solid waste services are not interrupted during this process. If nonpayment continues until the end of the fiscal year, there is the possibility of tax-sale of their property. Additionally, the County offers a tax credit program for those living on limited or fixed incomes, and informing homeowners of this tax credit could help alleviate some nonpayment issues. The recommendation is to continue these practices.

**Recommendation for mitigating nonpayment in both Subdistricts during Implementation** → The County continues to inform homeowners about Homeowners’ Property Tax Credit program for those living on limited or fixed incomes. County continues established process for nonpayment or late payment of property tax bill (which includes the SBC and RCF). County continues to provide a variety of methods to pay property tax bill. County continues to provide solid waste services to that property regardless of property tax payment status.

Elements / Steps include:

- County continues to inform homeowners about Homeowner’s Property Tax Credit program by including information on the County tax payment website and in the mailed property tax bill.
- County continues to provide a variety of mechanisms for homeowners to pay: online, phone, in-person, and by mail.
- County continues to enact the established process for nonpayment or late payment of a property tax bill.
  - Delinquent notice sent in April.
  - Property owner must pay interest (8%) and a penalty (12%) for late payment of their property tax bill.
  - If nonpayment continues, the homeowner is notified that the property will be sold at the tax lien sale.
- Regardless of property tax payment status, the County will continue to provide solid waste services to that property.

**Timing: Ongoing throughout implementation**

**How Recommendation affects Residents:**

- Residents will understand the actions taken and consequences as a result of nonpayment.

**How Recommendation affects Haulers:**

- No effect on haulers.

**How Recommendation affects the County:**

- County continues property tax nonpayment process.

### 2.D.5 Mitigating the Effects of SAYT on Low Income / Vulnerable Customers

SAYT may be perceived to negatively affect low-income<sup>61</sup> households and the RFP for this project indicated these types of policy considerations are relevant to Montgomery County.

<sup>60</sup> Information about process provided on 4/7/23 in an email from Anthony Skinner.

<sup>61</sup> Interested households can apply to the County for a discount. County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County’s traditional metric for other services).

A number of communities<sup>62</sup> with SAYT around the country offer a discount of this type, although it is a minority of communities.<sup>63</sup> This is likely because implementing a subsidy or discount of this type requires: identifying an acceptable, efficient, and reasonably convenient administrative system to certify that the potential recipients meet the desired income qualifications; and the system needs to provide the service in a way that does not stigmatize or identify participating households.<sup>64</sup> Traditionally, the discount is provided for the lowest can size, without additional discounts for larger cans, to preserve incentives for recycling and reduction.<sup>65</sup> In addition, traditionally, the certification is valid for a calendar year or two years, a convention that reduces administrative workload, and acknowledges that, unfortunately, low-income-qualified do not tend to leave the status regularly.<sup>66</sup>

According to Montgomery County data, 46% of households in the Equity Focus Area (EFA) are owner-occupied; in the non-EFA area, the figure is 72%. A total of 11.9% of the residents in the EFA qualify as low-income below the poverty level compared to 6.9% for the County. This indicates there may be a substantial number of households in Montgomery County that are homeowners but are below the poverty line. For these customers, special discounts could be very meaningful and beneficial. The program is assumed to offer a discount on the smallest can (with no additional discounts), and this same dollar discount<sup>67</sup> is applied, no matter which container size is selected by the household. The discount is provided for the full calendar year. The household must qualify for the discount annually, as described below<sup>68</sup>.

A special complicating factor for Montgomery County is that the SBC charges through which the SAYT services would be charged, are included in the property tax bill. Those low-income households that are not property owners cannot easily be reached through a property-tax-bill discount approach. And verifying any system that involves working through property owner landlords to deliver discounts through rent adjustments would be a complex undertaking for the County. This option is not discussed further below.

**Recommendation for Mitigating Effects of SAYT on Low Income Customers** → Low-income homeowners submit qualifications to the County Department of Finance, Division of Treasury (or designated Department) to apply for a 10-20% discount on their SBC. The discount is applied only to those qualified low-income customers for a discount based on requesting the smallest cart size. Households are certified every other year.

Elements / Steps include:

- County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County's traditional metric for other services).
- County staff develops an application portal, application paperwork and a qualification / approval system prior to dissemination of outreach procedures.

<sup>62</sup> Communities with low-income SAYT discounts include Toronto, ON and Seattle, WA

<sup>63</sup> Econservation 2015.

<sup>64</sup> That is, providing specialty-colored bags or containers, etc. is usually considered inappropriate.

<sup>65</sup> In addition, low-income is not coincident with large family. Large family discounts are generally not provided, in favor of preserving a signal to reduce and recycle.

<sup>66</sup> The savings from lower frequency recertifications likely outweigh the inequity of possibly providing a discount for a little extra time to a household that has stopped being low-income.

<sup>67</sup> Dollar discount is based on a percent discount set by the County.

<sup>68</sup> Trash volumes can be an issue in low-income areas. That means that those with limited income could have high trash bills and that is why some communities have introduced low-income rates or low-income adjustments. However, the billing system preferred by the County makes it difficult to offer subsidies to anyone beyond homeowners. To address renters, the County will have to consider options outside of its existing trash system.

- County staff devise a method to flag in the tax billing record for those households that successfully qualified for the discount. Those flags are used to “turn on” SBC values that are discounted by 10-20% for the SBC for the lowest container size. The certification is valid for 2 years (to minimize paperwork).
- County staff develops and releases outreach detailing qualifications for receiving a low-income discount on the SBC at the same time it advertises the cart request forms.

**How Recommendation affects Residents:**

- Low-income households have the opportunity for a discount on a basic service.
- Interested low-income households must apply for the discount.
- Households receive information on SBC, with additional discounts available to qualified low-income customers.
- Households that wish to qualify submit supporting paperwork, and the County uses its new administrative system for qualifying any applicants.
- Households qualify for and receive a lower SBC bill for the lowest container.
- Households recertify every other year.

**How Recommendation affects Hauler:**

- No change.

**How Recommendation affects the County:**

- County staff modifies the way the SBC is calculated to cover the cost of the subsidy.
- County staff must establish staffing for certification, and the forms associated with approval.
- County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County’s traditional metric for other services).
- County develops a request procedure and application forms for interested low-income households to complete to apply for the discount.
- County conducts outreach, including information on the availability of income-qualified discounts.
- County distributes the paperwork to those requesting the information. County reviews the paperwork and approves qualified applicants. Their addresses are entered into the tax records for use in offering low-income discounts of 10-20% off the SBC for those selecting the smallest container.
- The County refines the system based on results of the pilot test prior to County-wide roll-out.

**Timing:**

- Develop the procedures and outreach materials at least 8 months prior to full roll-out of the program, and refine the system based on results of the pilot test.

## 2.E Cart Selection and Outreach Program

The success of the new SAYT system, especially the system as implemented in Montgomery County, will hinge on a clear, consistent, and aggressive outreach campaign.

### 2.E.1 Customer Cart Choice Recommendations – Implementation

The basis of a SAYT program is allowing homeowners<sup>69</sup> to make a choice for which size trash cart they feel like will be able to manage their household’s trash. The County will need to provide a mechanism for homeowners to make this choice, as well as supporting information to help guide homeowners into making the most appropriate sizing choice for their household. The County will also need to provide

<sup>69</sup> Due to the County’s billing system, cart choice outreach will be sent to, and cart selection will be made, by the property owner, who may or may not be the person residing at the residence (i.e., renters).

information to homeowners on rightsizing the household's cart choice. The steps below walk through what the customer cart choice process should follow in both Subdistricts A and B.

**Recommendation for Customer Cart Choice Process in both Subdistricts** → Have three different options for homeowners to choose the size of their cart: online web form, paper form that can be e-mailed, and by calling MC311. Allow one cart size increase per household, then additional changes incur a fee. Downsizing cart choice should always be no cost to homeowner but a cart switch payment to hauler should be incorporated into all hauler contracts.

Elements / Steps include:

- County creates form structure with information needed from homeowners. Having a variety of ways homeowners can notify the County of their cart choice is key for inclusivity and flexibility. The form should also be in English, Spanish and Mandarin. Encourage online web form as it will be easiest for data transfer to cart distributor. Information to collect and convey on the form:
  - Collect: homeowner/household name, service address and account number (optional), phone number, email address, cart container size choice (32-gallon, 64-gallon, 96-gallon)
  - Include annual pricing next to cart choices.
  - Remind homeowners that recycling is included in the pricing.
  - Remind homeowners that payment will be through tax bill
  - Deadline to respond. If homeowner does not choose a cart size, they will automatically receive a 32-gallon cart
  - Include SAYT specific email address and MC311
  - Mention that occasional excess trash can be put in bags affixed with pre-paid stickers

**Timing: 6 months prior to implementation.**

- County creates rightsizing guidelines for homeowners to include on paper and web form. Include photo of person next to cart sizes for reference.
  - If household generates 2-3 bags (13-gal tall kitchen bags) of trash or less per week: 32-gallon.
  - If household generates 4-5 bags (13-gal tall kitchen bags) of trash per week: 64-gallon.
  - If household generates 6-8 bags (13-gal tall kitchen bags) of trash per week: 96-gallon.
  - If household generates more than 8 bags (13-gal tall kitchen bags) of trash per week, they will need an additional trash cart
- The change for the recycling collection program is to switch out the 22-gallon bin for a 35-gallon cart for comingled containers.
- County sends letter with the information in Step 1 to homeowner. Give homeowners **6 weeks** to respond to cart choice request. Build reminders into SAYT social media content calendar and other SAYT outreach (see section Education and Outreach recommendations).
- County tracks cart requests in database of service addresses organized by route and send reminder **two weeks prior to deadline** to addresses that have not responded.
- If homeowners do not respond, automatically assign them a 32-gallon cart. Provide database of service addresses and cart choices to cart distributor (see section Cart Rollout recommendations).
- For cart exchanges, households can upsize their cart once in the first year for no fee, then additional upsize requests or requests for an additional cart will incur a cart change fee and the associated incremental SBC fee. Requests to downsize carts are not charged either an exchange fee or an incremental fee. (See Method of Billing for SAYT Program – Variable Charges for Cart Sizes section). Cart exchanges and charges should be emphasized in the outreach with reminders 3 months before tax bills are computed, with a deadline 2 months before tax bills are computed, for increases and decreases in container sizes. Every contract going forward should have performance penalty and incentive clauses in them as well as the ability to terminate the contract if the contracted entity it does not meet performance standards.

**How Recommendation affects Homeowners/households:**

- Homeowners will have a clear understanding of their cart options and will receive guidance from the County on rightsizing. Homeowners will have a variety of ways to make their cart choice. households will understand their options to switch cart sizes after program implementation.

<p><b>How Recommendation affects Haulers:</b></p> <ul style="list-style-type: none"> <li>Hauler will need to ensure the service address and route database is up to date and provided to the County.</li> </ul>
<p><b>How Recommendation affects the County:</b></p> <ul style="list-style-type: none"> <li>County staff needed to carry out the steps above. County will need to develop online and paper forms. County will need to send informational letter and paper form to all households.</li> <li>County will work with cart distributor to transfer data on cart choice correlating to service address for delivery of carts.</li> </ul>

The final cost Impact was the cost of providing carts for both the semi-automated and automated cart-based collection service. The SAYT program assumes that two of the three scenarios are cart-based collection programs. The framework assumes the following distribution of carts for trash collection in both Subdistrict A and B<sup>70</sup>.

**Figure 2.8: New Refuse and Recycling Carts**

Collection Cart Costs	32 gal (T) 35 gal (R)	64 gal	96 gal	Total Cost	Cart Replacement & Inventory:	Annual 10 Years
Refuse Cart Cost	\$50.00	\$65.00	\$75.00			
Transportation	\$1.95	\$3.25	\$5.30			
Assembly and Distribution	\$6.50	\$6.50	\$6.50			
Cost per Cart Total	\$58.45	\$74.75	\$86.80			
Replacement and Maintenance					2.50%	
Area A*	54%	28%	18%	\$6,367,440	\$159,190	\$652,660
Area B*	54%	28%	18%	\$8,700,650	\$217,520	\$891,820
Recycling Carts A and B	100%			\$14,732,520	\$368,310	\$1,510,080

Table note(\*): note the derivation of the cart size distribution estimate is discussed in Section 2.F below.

Cart manufacturers will often incorporate the assist communities with the distribution of new carts upon request and will build this cost in the cart cost. The Project Team assumed that the cart manufacturer would assist in the distribution of carts given that large number of carts that would be ordered and the cost per cart reflects these costs. These costs are based on recent bids, but the market is highly variable at this time so the cost could vary up to 10-15%. Alternatively, if the contract with haulers stipulates that they would assist in the distribution of carts, then the cost would be borne by the hauler and spread over the term of the contract. The total cost figures do not include the increase in collection cost for this approach as the recommendation is to operate under the same contract model that is currently utilized in Subdistrict A.

### 2.E.2 Education and Outreach Recommendations - Implementation

Education and outreach are the key to successful SAYT implementation in Montgomery County. This plan walks the County through how to actively engage the public and other stakeholders before, during,

<sup>70</sup> Certain County labor protection laws – including requirements for wages, labor peace agreements, and displaced workers – apply only to employees of trash haulers under County contracts. Expanding Subdistrict A requirements to the entire residential service areas in the County would extend these local protections to more trash collection workers. *Trash and Recycling Collection: An Evaluation of Current Policies, Montgomery County Office of Legislative Oversight, Report 2019-17, November 12, 2019*

and after the SAYT implementation process, as well as what the most important parts to communicate to residents about the upcoming program and decisions that will need to be made. The education and outreach recommendations include a combination of traditional communication techniques (direct mailers, media coverage, etc.) and two-way engagement techniques (responsive website, participation at events, volunteer engagement, etc.).<sup>71</sup>

**Recommendation for Education and Outreach in both Subdistricts** → Continue the award-winning outreach programs Montgomery County has; craft new, clear messaging and outreach specific to SAYT implementation and why it is important; measure effectiveness of these efforts.

Elements / Steps to include:

- County review best practice recommendations in this study (see Appendix H: Education and Outreach Plan) along with learnings that the County has gained over time from previous program implementations. Create template documents for focus group testing. Create and/or revise talking points from pilot and brief upper management and elected officials on the benefits of SAYT. Continue communicating with pilot hauler to make sure pain points from pilot have been addressed. Conduct focus groups with specific audiences: equity areas, pilot participants, etc. Create a SAYT specific email address.

**Timing: 9-to-18 months prior to implementation.**

- County holds public information meetings with county residents, haulers, businesses, community groups, and other interested parties to discuss the timing and implementation of a change in solid waste collection. This process includes:
  - Issue notice of public meeting
  - Present program information and how it affects residents and haulers
  - Gather input from public to help inform program refinements

**Timing: 9-to-18 months prior to implementation**

- County develops and launches SAYT program webpage. All outreach material should be translated into Spanish and Mandarin, at a minimum. Begin communicating via mailers and public meetings to residents when the program is coming and initial details<sup>72</sup>. Include any calls to action, such as choosing a trash cart size (see section Customer Cart Choice). County should have a web-based, paper and phone way to make this choice. County incentivize customers choosing cart size through contests, neighborhood block grants, etc. (e.g., the neighborhood with the largest number of respondents to cart choice gets plants to beautify a neighborhood entrance). Update existing labels for new trash and recycling carts based on feedback from pilot. Update 311 Knowledge Based Articles on SAYT program.

**Timing: 6-to-12 months prior to implementation.**

- County develops outreach material (e-news article, media release, etc.) focusing on the coming program and successes from the pilot. Continue participating in community events and working with faith-based community groups and neighborhood leaders to help get the word out. Create social media content calendar. Ramp up Recycling Volunteer and Block Captain programs.

**Timing: 6 months prior to implementation; 6 months following implementation.**

- County continues general recycling education and outreach activities. Distribute educational material (“oops tags”, notice of violation) for “repeat offenders” – contamination, overflowing containers, etc. (see sections on Mitigating Contamination and section Overflowing Containers). Continue to create and execute on social media calendar.

**Timing: Ongoing throughout implementation.**

- County replaces aging stickers/labels on trash and recycling carts as needed. Update webpages with commonly asked questions/complaints. Highlight program successes. Maintain feedback loop with haulers and CCL/PPF to address challenges and opportunities. Conduct twice/year surveys with households to

<sup>71</sup> Communities with SAYT and strong outreach programs include San Antonio, TX and Milton, MA.

<sup>72</sup> Note that education and outreach will need to be heavier in Subdistrict B, as residents have not received County trash service before and will face more changes to their trash service than residents in Subdistrict A.

determine resident understanding and satisfaction with program.

**Timing: Ongoing**

- County establishes SAYT specific outreach and engagement goals – both quantitative and qualitative – and continue to measure and assess these goals. Use information from Section Tracking and Metrics to build into measures of overall programmatic success. Outreach metrics to track include:
  - Metrics around social media engagement (e.g., total followers, post views, number of shares)
  - Press release picked up by [number] news outlets
  - [Number] of visitors to the Montgomery County SAYT web page
  - [Number] of views of a YouTube video
  - [Number] of volunteers participating in County programs
  - Understanding major successes and challenges from different demographic viewpoints
  - Pinpointing specific contamination issues with the CCL and PPF
  - Recognizing community partnerships that have helped outreach efforts
  - Realizing the extent to which outreach efforts have helped successfully implement SAYT program and identified places that need improvement

**Timing: Ongoing.**

**How Recommendation affects Residents:**

- Residents in both Subdistrict A and Subdistrict B will receive information pertaining to the SAYT program implementation and will better understand next steps, how to participate and how to make the program work best for them.
- Residents will be able to get answers to their questions through webpage and other outreach material.
- Residents will understand the reason for the switch to SAYT, as well as program successes.
- Residents will understand how to participate in the Recycling Volunteer and Block Leader programs.

**How Recommendation affects Haulers:**

- The County should require haulers to participate in some of the outreach activities (include as RFP requirement – sections Modified Contract Trash and Recycling Service in SD A and Contracted Trash and Recycling Service in SD B). Haulers should use cart distribution as an opportunity to provide additional education on SAYT. The initial cart distribution will be performed by contractors working under the management of the County and its cart vendor. Accurate verification of addresses and locations from County residential databases associated with an onboard GIS system on cart distribution trucks are an essential component of a cart distribution program.
- Haulers will need to monitor households for overflowing containers, obvious contamination, etc. (see section Tracking and Metrics).

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County already has a robust education and outreach team capable of producing high-quality outreach materials.
- County needs to provide public education to residents in Subdistricts A and B before, during, and after program implementation.
- County will continue working to support Recycling Volunteer program and Block Leaders program.
- County will establish outreach goals and measure effectiveness of outreach campaigns.

**Figure 2.9: Additional Enforcement and Education Costs**

	Subdistricts A + B
Residential Enforcement	\$374,730
Education and Source Reduction	\$1,106,050



## 2.F Billing and Charges

This section summarizes the design and implementation of the SAYT billing system – using a graduated SBC charge based on size of trash container. It also provides an estimate of the resulting SBC+RCF charges, using the study-estimated impacts for the SAYT program. To develop those fee estimates first requires the derivation of the expected percent of small, medium, and larger carts selected by the single family households County-wide.

### 2.F.1 Estimated Cart Subscriptions for Trash Cart Sizes

Under a SAYT system, neither tonnage nor households are the unit of charging; instead, it is the trash service level, reflected in the container size of trash collected from the household<sup>73</sup>. The choice of container is directly related to the volume (or gallons) of trash service the household will need under the new SAYT system, after any new recycling, yard trim, and source reduction changes that are induced by the SAYT price difference between container sizes.<sup>74</sup>

A curbside trash measurement survey was conducted in Montgomery County to characterize current trash service usage. The ‘set out’ survey recorded the volume and weight of service used by a statistical sample of households in Subdistrict A.<sup>75</sup> This identified the current number of gallons used in a typical week by each household, and as a result, also identified the estimated percent of households needing any particular service level volume. The estimate of the trash tonnage reduction from SAYT outlined earlier in this report provides guidance on how much trash service reduction will occur in the County, and thus, the changes in the percent of County households that are estimated to need different volumes of trash service, driving the selection of specific container sizes. The results from this calculation are used in two places in the design and implementation of the SAYT system design, as outlined below.

**Recommendation for Trash Cart Size Service Level Requests** → The estimate of the cart size requests for the County-side SAYT program is expected to be: 54% choosing 32-gallon can, 28% selecting 64-gallon serviced, 16% selecting 96-gallon carts, and 2% requesting more than 96 gallons of service (second cart).

Elements / Steps included:

- To establish the baseline of the current (pre-SAYT) trash service usage and its distribution County-wide, the consultants conducted a special field survey to gather the volume and weight of trash set out from a statistical sample of households in Subdistrict A.<sup>76</sup> This provided the distribution of trash set outs prior to the introduction of a SAYT program.
- The percent reduction of trash tonnage estimated earlier by the consultants was used to “reduce” the number of gallons used by each household in the set out survey, altering the distribution of service usage for the post-SAYT situation. The estimate of the number of gallons used was further reduced (by 10%) to

<sup>73</sup> Cart subscriptions averages in other communities: San Jose (pop 1M), Seattle (pop 700K), Oakland (pop 400K): 21% on 20 gal; 71% on 32 gal; 7% on 64 gal; and 1% on 96 gal. All have recycling, organics, and strong incentives.

<sup>74</sup> Due to the County’s billing system, cart choice outreach will be sent to, and cart selection will be made, by the property owner, who may or may not be the person residing at the residence (i.e., renters).

<sup>75</sup> The sets outs were conducted in a number of different neighborhoods to represent the community. Information on the study methods is included in Appendix C: Set-Out Field Survey. No data were collected in Subdistrict B because collection days vary by hauler, and their routes and days were unknown. Instead, the averages from the responses from the web survey on the amount of trash set out for survey respondents in Subdistrict A and Subdistrict B were compared and found not to be statistically different. The results from the field work in Subdistrict A were used county-wide.

<sup>76</sup> A description of this study and its design features is provided in Appendix C: Set-Out Field Survey.



represent the service usage if a significant number of customers elected to compact or “stuff” the waste into smaller cans on a regular basis to save money.

- The consultants translated the volume needs into selections of can sizes using the thresholds of gallons of service (32/64/96, and greater than 96 gallons) to identify the percent of customers needing each can service level (“subscriptions”), with and without “stuffing” included.
- The consultants compared these subscription results with those found in a variety of communities across the US. Using these resources, estimates of the recommended or projected container subscriptions were derived, and are presented in the recommendations statement.
- *These estimates should be informed by the results of the pilot study, and revised accordingly, with judgement, recognizing that not all conditions of the full-scale implementation of SAYT can be replicated in the pilot study (actual changes in charges varying by cart size, and the limited level of transparency of the charges when included in a tax mailing).*

**Implementation of the Results:**

These subception projections were forwarded to other parts of the project.

- They are needed to estimate the cost of purchase of new carts for the SAYT system (different sized carts have different purchase prices; discussed in a later section), and
- The subscription results are also vital in the SBC charge setting steps for the SAYT program (discussed in a later section).

**How Recommendation affects Residents:**

- Households need to receive ample education about the annual financial savings associated with different can sizes, achieved through greater recycling, and waste diversion and must consider options based on tradeoffs between savings and behavior change, and choose a continuing cart size. Methods are discussed in section the Customer Cart Choice section.

**How Recommendation affects Haulers:**

- No changes at this point; however the results from the expected distributions will affect cart ordering (discussed later), and SBC charge-setting tasks (discussed later).

**How Recommendation affects the County:**

- The results of these calculations are an input into the new way that the SBC is calculated under SAYT; the computation is more complex, involving multiple steps described in the charge setting implementation section.
- County needs to provide extensive public education to residents in subdistricts A and B to allow households to make informed choices.

**Timing:**

Calculations are needed prior to the date households are asked to select trash cart sizes, as decisions will depend on associated SBC cost variations for the SAYT options.

The projected cart subscriptions developed from these computations are provided in the figure below.

**Figure 2.10: Projected Percent of Customers by Cart Size**

Pct on	Projected Subscriptions by Cart Size
32 gal	54%
64 gal	28%
96 gal	16%
>96	2%

This results in an average gallons of trash service across the County of 52.5 gallons per week<sup>77</sup>. More details on these calculations are included in the spreadsheet model provided under separate cover.

## 2.F.2 Method of Billing for the SAYT Program - Variable SBC & RCF Charges for Cart Sizes

The County's current system of charging for the costs to the County of providing a variety of solid waste collection, processing, and other direct and supporting services is based on charges included in the tax bill as a fee for service. These charges have variations by customer group (residential vs. multi-family vs. commercial, Subdistrict A vs. Subdistrict B, etc.) related to services received. The new SAYT system incorporates a number of changes that affect the way that costs are recovered from households in the County. For example, a change to having trash collection services provided by a (set of) County-contracted haulers in Subdistrict B need to change household payments from direct-to-haulers to the County so these contractors may be paid.

This method of having the solid waste charges included in the property tax bill as a fee-for-service charge brings advantages, and is strongly preferred by the County (See Appendix J: Other Billing Options for more detail on the pros and cons). There is an established set of procedures within the Department of Finance, Division of Treasury if full payment is not received. The fund is stable and well-integrated. After multiple discussions with County staff regarding options to charge for costs to the County for changes to the provision of services from the SAYT program<sup>78</sup>, the recommendation was to continue to compute fee for service charges in a manner consistent with the current system of computing costs for base and incremental solid waste management services, but to provide a volume-based signal focused on the System Benefits Charge (SBC) as follows.

*The current SBC is identified as the baseline, and is the charge for costs to the County for base and incremental solid waste management services County-wide. This is the SBC level charged for the smallest trash container offered (32 gallons). Extra charges are then added to the base SBC to reflect the volume-based SAYT charge incentives associated with the larger cart sizes, in turn (64-gallon, 96-gallon and additional 96-gallon containers). With the new system, it is assumed the County moves to uniform services across the County, and all single-family households face the same SBC charges, whether they live in Subdistrict A or Subdistrict B.*

The charges remain included in the tax bill as a fee-for-service charge, using current assessment, distribution, billing, and enforcement procedures. As noted elsewhere, for cart exchanges, property owners can upsize their cart once the first year for no fee beyond the associated incremental SBC charge; after the first in the first year, additional upsize requests or requests for an additional cart in any year will incur both a delivery fee and the associated incremental SBC fee. This is a special invoice to the property owner that will need to be produced by the Department of Finance, Division of Treasury. Requests to downsize carts do not incur an additional delivery fee, and the SBC charge reductions are reflected in the *next* tax bill, with no special invoice issued.

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<sup>77</sup> Less aggressive scenario results can be found in the accompanying model on tab "SetOutTables." The less aggressive subscription levels are: 32-gallon 40%, 64-gallon 40%, 96-gallon 15%, over 96-gallons 5%, with a County average of 57.6 gallons per week.

<sup>78</sup> The Appendix E: Feasibility Analysis discusses the tradeoffs associated with several options.

The Refuse Collection Fund (RCF) is currently charged to all households in Subdistricts A & B. Reduction in routes and staffing (See Section Collection Route and Truck Impacts and Costs), and costs for purchasing new carts are reflected in the updated RCF included in the tax bill.

**Recommendation for Method of Charging for SAYT System Charges-for-Service County-Wide** → The County's current SBC charge for costs related to solid waste management services is used as the SBC level charged for the smallest trash container offered (32 gallons). Extra charges are then added to the base SBC to reflect the volume-based SAYT charge incentives associated with each larger cart size offered. These, along with the RCF, become the uniform County-wide fee-for-service charges under the SAYT system. These fees are in place for the year. Households up-sizing their carts are provided a separate invoice including a delivery fee plus the extra incremental SBC associated with the larger cart size.<sup>79</sup>

Elements / Steps include:

- Programming changes:
  - The County modifies the programming for the single-family properties to account for: County wide SBCs (same levels for Subdistrict A and B); and allowing for at least 6 charge levels, four of which will be used in the short term (matched to the charges for the four recommended cart sizes).<sup>80</sup> The County modifies any automated language used to explain fees on the tax bills to properly reflect the changed SBC & RCF.
  - The County develops an input system for associating the cart size requests for any property into the record for each single family property that receives a tax bill.
- Process for Cart Size Assignment and Changes in Property Owner Records for Tax Bills:
  - The County inputs the cart size request / delivery information to identify the cart size associated with each single-family property that receives a tax bill.
  - The County develops a system by which Property Owners may request changes in their cart size (on-line and written or phone-in options). The requests must be verified and delivered to the Department of Finance, Division of Treasury. The Department may elect to delegate these activities to the Department of Environmental Protection, Recycling and Resource Management Division or another Department / Division.
  - The Department of Finance, Division of Treasury must issue an invoice to the property owners requesting an up-sized cart, including the cart exchange fee and the incremental SBC associated with the cart up-sizing. If it is the first request in the first year, the cart delivery fee is not included. For a cart down-size, no invoice is sent.
  - After invoice payment is received by the County (or immediately, in the case of a down-size), authorization to provide a cart exchange is forwarded to the Department of Environmental Protection, Recycling and Resource Management Division. The Department prepares the appropriate work order for the relevant collection contractor or cart management contractor. When the work order is complete, the Department forwards the information to the County Department of Finance, Division of Treasury to complete the update of the cart size in the customer's tax bill record.
- Computing the Variable SBC:
  - The County uses its current procedures to identify the average cost per household for the SBC for the fee-setting period.
  - The County uses the best estimate of distribution of cart sizes for households across the County (including Subdistrict A and Subdistrict B). In the first year, this will come from the study's results

<sup>79</sup> One first free cart size increase in the first year is allowed without the delivery fee. Cart size decreases are allowed without delivery charges. However, the reduction in SBC is not provided until the next tax bill. The Consultants recommend that the Department of Finance, Division of Treasury work to incorporate a retroactive reduction in the next tax bill for the proportional savings due, but the Department will need to determine if this can be accommodated.

<sup>80</sup> At the same time, the County may want to allow for one or more "extra charges", depending on how it plans to charge for organics collection or for low-income discounts.

and the results of the pilot test cart selections. In later years, this will come from the existing distribution of carts, adjusted for any size-change requests made as a result of the annual reminder to customers to update their cart sizes.

- The County confirms the policy for the incentive level for charge increments between cart sizes for the SAYT system. The consultants recommend that this incentive be set at 60% for double the cart volume for the early years (see discussion below this box). The County may opt to increase this to provide stronger incentives in later years, or as available diversion programs are refined or new options introduced.
- County staff runs the charge calculator provided in the spreadsheet model delivered with this report. The County staff fill in the relevant inputs – specifically 1) 60% differential for double the cart volume; 2) the cart size distribution, specifically the percent of households with 32-gallon, 64-gallon, and other cart sizes; and 3) the computation of the SBC.<sup>81</sup>
- County staff subtracts the calculated result for each cart size larger than the smallest container (larger than 32 gallons) from the value assigned for the smallest cart size (32 gallons). These increments are added to the base SBC and assigned as the SBC for each cart size in turn. These are the charges assigned for each cart size, and are the SBC charges included in outreach, and in the tax bill.
  - The smallest cart (32 gallons) is charged the traditional SBC. The next size cart (64 gallons) is charged an SBC computed as the 32-gallon SBC plus the difference between the model’s annual estimate for 64 gallons minus the annual estimate for the 32-gallon cart. The next size cart (96 gallons) is charged an SBC computed as the 32 gallon SBC plus the difference between the model’s annual estimate for 96 gallons minus the annual estimate for the 32-gallon cart. The charge for additional 96-gallon carts is computed as the SBC computed as the 32-gallon SBC plus the difference between the model’s annual estimate for extra 96-gallon carts minus the annual estimate for the 32-gallon cart.
- Invoicing for Extra / Overflows in Carts Using Stickers purchased at stores:
  - The development of this system is documented in the section on “Mitigating Overflowing Containers”, including identifying vendor partner stores, setting up invoicing and other tasks.

**How Recommendation affects Residents:**

- Property owners in Subdistricts A and B continue to pay the County for Service.
- Households in Subdistrict B no longer receive bills for service from their individual trash collector. Payments are now made by Property Owners to the County through the tax billing mechanism.
- Property Owners in Subdistricts A and B may request cart size changes (See Cart Change section)<sup>82</sup> by submitting a request through a system managed by Department of Finance, Division of Treasury, unless delegated to another Department. The Department of Finance invoices the Property owner for upsized carts, and owners must pay this invoice before a larger cart is delivered. Those requesting down-sized carts are not invoiced.
- Households receive ample education about the annual financial savings associated with different cart sizes, achieved through greater recycling, and waste diversion.
- All households will continue to receive RCF charge.

**How Recommendation affects Haulers:**

- Haulers in Subdistrict B do not send bills; no change for haulers in Subdistrict A.

**How Recommendation affects the County:**

- County staff refine the tax-based billing system to allow for the requirements of the new SAYT system, including: modifying the way the SBC is calculated; the computation is more complex, involving steps 1-5 above.

<sup>81</sup> Inputs for cart volume differential and cart distribution are located in the accompanying model on tab, “SBC Calc by Cart (SAYT).” New SBC costs are located on tab, “LIVE SBC Plus Refuse Collection.”

<sup>82</sup> See section, “Customer Cart Choice Recommendations – Implementation,” for more information, including deadlines for cart changes.

- County needs to provide extensive public education to property owners and households in Subdistricts A and B.

**Timing:**

- The changes to the billing system will take time and should be started at least a year prior to full implementation of the new SAYT system, and tested fully.
- The new invoicing system for cart size changes should be started near the same time to take advantage of the deferred start that will be provided through the pilot test period and the waiting time for RFPs and contractor selection that is part of the full roll-out of this new system.
- Work to input the requested cart sizes will also need to be completed in advance of the date that tax bills are computed and issued.
- Calculations for the new SAYT SBC charges are needed prior to the date households are asked to select cart sizes / service levels (Using best estimates of cart sizes from the modeling and the pilot), as decisions will depend on associated cart charges.

To achieve behavior change from SAYT requires differences in charges that meet thresholds that are noticeable to households, and are visible and clearly linked to service levels. Higher financial incentives (much higher costs for larger carts) would be expected to lead to more diversion than low financial incentives (carts that are very close in cost). The aggressiveness of the SAYT incentive can be expressed as the percent extra charge for double the gallons or for 32 additional gallons beyond the first 32 gallons. A percent of 100% means the SBC is double the level for twice the service volume (or 32 more gallons); a difference of 50% would mean the SBC would be half as large for the second 32 gallons as the first. The best available research on optimal differences in charges for different sizes of carts<sup>83</sup> indicates that:

- Fee differentials of 80% extra for double the trash service volume (moving from 32 to 64 gallons) provide nearly the same diversion performance as charges that are 100% extra for double the service (double the cost for double the service, or “linear” charges).
- The recycling incentive associated with cart costs that are less than 50% extra for double the service volume show a substantial drop-off in impact.
- The ability to achieve a similar recycling incentive with an 80% differential reduces the revenue risk to the community (or hauler) from potential mis-calculations in projections of container size selections.

The County’s system of charging for solid waste services (annually, and with SAYT charges to be one somewhat obscure element in a larger tax bill) is unusual, and it is not certain how customers will react to this incentive signal. To reduce the chances of implementing a complicated SAYT program (and its associated administrative, collection, and other changes) and *not* achieving significant diversion, the consultants recommend using a 60% incentive differential in the SAYT charge incorporated into the SBC. A longer discussion of this issue and associated tradeoffs is provided in Appendix E discussing the Feasibility Study.

### 2.F.3 Calculation of the Estimated SAYT Incentive Charge Increments for the SBC

The assumptions provided above provides the information needed to estimate the graduated SBCs associated with each of the container sizes for the new SAYT system. This derivation of the SBC and RCF is described below.

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<sup>83</sup> *Econservation 2014, for EPA Region 9.*

**Recommendation for Variable Charge Levels for Service County-Wide** → Estimation for County-wide annual SBC levels for SAYT cart sizes (based on incremental changes from existing SBC base fee) are: \$307.98 / year for properties selecting 32-gallon trash service; \$438.12 / year for properties selecting 64-gallon trash service; \$568.25 / year for properties selecting 96-gallon trash service, and \$958.65 for properties selecting an additional 96-gallon cart. These fees reflect a 60% SBC increase for 32-gallon increments of service over the first 32-gallon cart, and are based on the projections of cart size distribution developed by the study. The RCF billed to all households will decrease from a projected \$127.00 (2023) to \$150.22 (2023). Rates for overflow stickers are confirmed at \$3.50-\$4 per sticker (assuming a 10% commission for retailers), and the cart switch fee should be determined based on costs negotiated with the contracted agent (hauler or specialized cart firm).

The calculations, provided in the accompanying workbook, were conducted as follows.

- The previous single-family SBC of \$288.21 from the spreadsheet memo<sup>84</sup> from the County served as the starting point for computations of the revised SBC for the SAYT program.
- RCF current charge of \$127.00 and updated computation are based on spreadsheet provided by the County<sup>85</sup>
- The consultants reviewed the source of each element of the incremental SBC computation, which included items especially relevant to the SAYT program (recycling, etc.), and developed changes to the estimates using the following steps:

#### BASE SYSTEM BENEFIT CHARGES

- Change to the sector share of base costs assuming changes in tons from SAYT<sup>86</sup>.
- Change in the offset from refuse disposal fees tipping fees to reflect a reduction in disposal tons from SAYT.
- Change carried through to the Base Costs to Collect on property levy
- No change to the (relevant) households or commercial gross floor area units
- Leads to recomputed Base System Benefit charge on Property Levy from \$40.15 to \$42.16 per household (from reduced disposal offset and change in sector tonnage share)

#### INCREMENTAL SYSTEM BENEFIT CHARGES

- Change to the recycling entry to reflect increased tons diverted by SAYT, and implied dollars per ton unchanged.
- Satellite sites changed to reflect the increase in scrap metal diversion from SAYT.
- No change to the entries for studies specific to non-residential sector
- No change to the organics – food waste entry (pilot program)
- No change to the stabilization fund entry
- Change to the composting entry based on number of tons times the incremental cost per ton
- Household counts are changed to reflect the current number of households and the predicted increase in households for the next year.
- Leads to recomputed ISCB to be Charged on Property Tax Levy (\$/household) from \$198.89 to \$220.87 (from increased recycling and composted tons.).

#### DISPOSAL FEES

- Change to Tons of disposal in Sub-Districts A and B non-municipal, reflecting a reduction of 29,314 tons from SAYT.
- Following through the calculations adding a small change in number of households, leading to a re-computation of disposal tons per household (from 0.8193 to 0.7491).

<sup>84</sup> Solid Waste System Disposal Fund, Rate Setting Methodology FY23

<sup>85</sup> FY23 Refuse Collection Fund display

<sup>86</sup> See tab, "New SBC Calculation," in the supporting model.



- No change in County Tipping Fee for Accepting Refuse at its Transfer Station (\$60/ton) leads to a revised figure for disposal fee levied on subdistrict A and B households on the tax bill in dollars per household. This value changes from \$49.16 to \$44.95.
- Revised total for Total System Benefit Charges Levied on Tax bill for non-municipal Single Family homes: changes from \$288.21 to \$307.98 annually as the base SBC.

**REFUSE COLLECTION FUND**

- RCF covers the omitted trash collection costs from previous calculations.
  - Changes in trucks, staff, and carts (See Appendix I: Memo Combined SBC and RCF Calculations for Montgomery County SAYT), result in a 17% reduction in trash collection (excluding tonnage related changes). This equates to a per household decrease of \$21.78.
  - The RCF decreases from \$127.00 to \$105.22 per household
- The smallest can available (32-gallons) is charged the \$307.98 annual SBC plus \$105.22 RCF for a total of \$413.21.
  - The “SBC Calc by Cart (SAYT)” sheet uses three inputs to estimate the SBC allocation to each container size. It uses information on 1) the average SBC plus 2) the percent of households expected to select each service cart size, and 3) the selected SAYT incentive differential (in percentage terms). The first two numbers come from previous calculations in this SBC Step and in the step forecasting the cart distributions. The third (60%) was outlined in the previous step on the method in which the SAYT SBCs would be billed and calculated.
  - This provides the computed can-specific SBCs that are consistent with the three assumptions above. These figures are used indirectly, providing the incremental amounts that are added to the 32-gallon SBC level for each successive cart size.
  - The SBC associated with the 32-gallon cart is the \$307.98 noted above. The differences between each cart size and the estimated 32-gallon charge are added to the \$307.98 to calculate the SBC for each cart size. This is a conservative approach that assures that the County will recover all costs associated with the SAYT system. The resulting figures are shown below.
    - Estimated 32-gallon SBC: \$307.98/year (\$25.67 per month)
    - Estimated 64-gallon SBC: \$438.12/year (\$36.51 per month)
    - Estimated 96-gallon SBC: \$568.25/year (\$47.35 per month)
    - Estimated SBC for additional 96-gallon carts: \$958.65/year (\$79.89 per month).
  - The combined SBC+RCF is calculated by adding the fixed RCF of \$105.22 to the variable SBC for the following annual (and monthly) charge values.
    - Estimated 32-gallon SBC+RCF: \$413.21/year (\$34.43 per month)
    - Estimated 64-gallon SBC+RCF: \$543.34/year (\$45.28 per month)
    - Estimated 96-gallon SBC+RCF: \$673.47/year (\$56.12 per month)
    - Estimated SBC for additional 96-gallon carts: \$1,063.87/year (\$88.66 per month).
  - As noted above, fees for overflow material stickers should be high enough to encourage households to sign up for the service level they really need. Dividing the incremental monthly fees by 4.3 (the number of collections per month), identifies about \$2.50 per 32 gallons for a weekly trash collection. The sticker fee should be significantly more than this value to encourage “right can size sizes to fit needs. The suggestion of \$3.50 to \$4 per sticker allowing disposal of an extra 32 gallons of trash volume is appropriate.

**How Recommendation affects Households:**

- These values reflect the new SBC+RCF to be included in the tax bills.
- Their sticker fees are also reflected; these stickers are to be affixed to material overflowing the cart size they subscribed to.
- Households receive ample education about the annual financial savings associated with different can sizes, achieved through greater recycling, and waste diversion. The published values should reflect

computations similar to those included here, but updated for any changes in conditions between now and when the SAYT system is implemented.
<p><b>How Recommendation affects Haulers:</b></p> <ul style="list-style-type: none"> <li>• No contracted haulers send bills; all SBC billing is to property owners through tax bills.</li> <li>• Contracted haulers collect waste in the sized containers.</li> <li>• Haulers should not collect materials outside the containers unless they have a sticker affixed.</li> </ul>
<p><b>How Recommendation affects the County:</b></p> <ul style="list-style-type: none"> <li>• County staff modifies the way the SBC is calculated; the computation is more complex, involving steps listed above.</li> <li>• County needs to provide extensive public education to residents in Subdistrict A and B.</li> <li>• County revenues are conservative and protected.<sup>87</sup></li> </ul>
<p><b>Timing:</b></p> <p>Calculations are needed prior to the date households are asked to select cart sizes, as decisions will depend on associated charges.</p>

**Figure 2.11: Annual SBC+RCF Results**

Cart Size (gallons)	Incremental SBC Incentive above 32 Gal	New SBC for cost to County for each can size	Monthly Differences (SBC/12)	New SBC+RCF (RCF=\$105.22)	SBC+RCF Monthly Differences (SBC+RCF)/12
32		\$307.98	\$25.67	\$413.21	\$34.43
64	\$130.13	\$438.12	\$36.51	\$543.34	\$45.28
96	\$260.27	\$568.25	\$47.35	\$673.47	\$56.12
192	\$650.67	\$958.65	\$79.89	\$1,063.87	\$88.66

Table Note: Computations using a lower rate differential can be found in the model on tab "LIVE SBC Plus Refuse Collection."

## 2.G Tracking and Refinement

Evaluation and feedback are essential to assessing the performance of the SAYT system, and they support continual improvements. Up-front planning to make sure data to support key metrics is a vital part of this evaluation and feedback loop. Implementation of these steps is described below.

### 2.G.1 Tracking and Metrics Recommendations – Implementation

Performance measures and metrics are an important part of tracking how successful a program is operating, and this information is particularly necessary as a new program is being implemented. Data tracking software installed in collection vehicles can ease the transfer of information from the curb to County staff, and having the ability for haulers to document and photograph noncompliance issues is key to educating and enforcing these issues. Examples of data collection software include (but are not limited to): Rubicon, Routeware, Soft-Pak, or other systems.

**Recommendation for Tracking, and Metrics** → County adopts and implements tracking with real-time tracking software used by collection vehicles to inform program enforcement, outreach, program evaluation, and continuous improvement.

<sup>87</sup> The model estimates that the charges structured in this conservative manner could potentially over recover on the SBC portion of the fees approximately 30%, or \$91/household in the first year. This protects the financial system and can be adjusted over time once the subscription levels are known, rather than estimated.



Elements / Steps to include for Tracking and Metrics for County:

- County identifies county data lead coordinator for the SAYT program (this person will manage all tracking for all metrics). This should be approximately .25 of an FTE. Please note that this role can be combined with SAYT Program Manager or can be handled by another person at the County.
- County ensures Montgomery County Department of Environment data team has the needed skills and/or training for data systems to be utilized for synthesizing hauler and disposal and processing facility data and that data systems are integrated as appropriate with enforcement team data systems.

Haulers

- Haulers of all material types shall utilize on board cameras and data systems with real time data transfers to the County for customer service and enforcement purposes (See Trash service recommendation for Subdistricts A and B). During the startup period of approximately 3 months data collection would lag as systems are integrated and data transfer tested. The County would use existing data collection program in areas currently served as an interim system. County shall ensure these requirements are incorporated into all collection procurements and contracts.
- Utilizing real time reporting and uploading to County data system, haulers shall daily report:
  - Scale tickets, including date, time, truck number, route number, net tons, material type, destination facility.
  - Set outs by address for each material type, date and time
  - Carts out of compliance, address, date, and time, and image
  - Contaminated recyclables by address, date, and time, and image captured through the onboard data system and cameras required under the new collection standards
  - Communications materials left on cart (such as “oops tags”), communication types, date, time, and addresses

Paper Processing Facility (PPF)

- The PPF contractor shall notify Montgomery County Department of Environment daily regarding loads of recyclables that based upon visual inspection are deemed to consist of  $\geq 15\%$  contamination by weight.<sup>88</sup> Contractor(s) shall supply the following information for the loads of recyclables that are deemed to consist of  $\geq 15\%$  contamination based on visual inspection: Date, time, truck number, route number, net tons, whether the load had  $\geq 15\%$  contamination by main contaminant, image of contaminated load.
- The PPF contractor shall monthly report to the County the percent of inbound recyclables by weight disposed as residue. This includes both rejects from any presort and residue from the processed recyclables.
- To assess recycling contamination, for the first two years of the SAYT program, the PPF contractor shall conduct hand sort audits of recyclables every six months using a methodology that complies with ASTM D5231: Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste. After the first two years of the program, hand sort audits shall be conducted annually unless issues arise resulting in the need for more frequent hand sort audits.
- Inbound tonnage reported monthly as part of invoice.

Comingled Container Line (CCL) Facility

- CCL contractors shall notify Montgomery County Department of Environment daily regarding loads of recyclables that based upon visual inspection deemed to consist of  $\geq 15\%$  contamination by weight. Contractor(s) shall supply the following information for the loads of recyclables that are deemed to consist of  $\geq 15\%$  contamination based on visual inspection: Date, time, truck number, route number, net tons, main contaminant, image of contaminated load.

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<sup>88</sup> Montgomery County can modify the percent contamination based on current performance. Prior to contamination cart tagging campaigns, Montgomery County had a 22% contamination rate.

- The Material Recovery Facility contractor(s) shall monthly report to the County the percent of inbound recyclables by weight disposed as residue. This includes both rejects from any presort and residue from the processed recyclables.
- To assess recycling contamination, for the first two years of the SAYT program, the Material Recovery Facility contractor shall conduct hand sort audits of recyclables every six months using a methodology that complies with ASTM D5231: Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste. After the first two years of the program, hand sort audits shall be conducted annually unless issues arise resulting in the need for more frequent hand sort audits.
- Inbound tonnage reported monthly as part of invoice.

Resource Recovery Facility

- Monthly invoices with tonnage data.

Yard Trim Composting Facility

- Yard trim composting facility shall notify the Montgomery County Recycling and Resource Management Division within 4 hours of receiving a load regarding loads of yard trim that has excess contamination. Contractor(s) shall supply the following information: Date, time, truck number, route number, net tons.
- Inbound tonnage reported monthly as part of invoice.

Landfill for Non-combustible Waste

- Monthly invoices with tonnage data by material type and which is collected curbside (date, truck, route, tons, time, material type, origination point (e.g., curbside, transfer station, RRF).

Transfer Stations

- Scale tickets for scrap metal collected curbside provided through real time.
- Tons of MSW collected at drop off locations for a charge provided monthly to data coordinator.
- Number of vehicles using MSW drop offs provided monthly to data coordinator.

Data Coordinator

- Ensures data is received from haulers and facility contractors as required per contracts.
- Annually, data coordinator publishes primary sustainability measures, sustainability sub measures, secondary sustainability measures, cost measures, illegal dumping measures and equity measures. These results should be made available to the County Department of Environment Leadership, County Government, the Solid Waste Advisory Committee, and the public (see table in attached Appendix K: Tracking and Metrics for detail).
- Quarterly, the data coordinator shall provide sustainability sub measures and equity measures to County Department of Environment Leadership, County Government, the Solid Waste Advisory Committee, and the public.
- Monthly, the data coordinator shall synthesize internal measures data (see table) from various departments and distribute to various teams in the department to inform effective implementation. Data sources and audiences includes: outreach, enforcement, billing, data from facilities and haulers, and customer service.
- Data lead coordinator reports monthly on data findings to department for first year of rollout and quarterly to department thereafter.
- County synthesizes data and presents annually to leadership.
- Annually, the County calculates net greenhouse gas (GHG) emissions change, and costs of service per household (see section Assessing Extra Environmental Benefits for details on methodology), Lbs. per household (HH) of trash disposed curbside per year; Lbs. per household of curbside waste generated per year (trash, yard trim, bulky waste, recyclables), Number of notices of violation and reason; and Number of tickets issued and reason.

#### Enforcement Team

- Monthly, the data coordinator provides enforcement team with list of households and associated evidence of households with three or more violations for same infraction.
- Monthly, County enforcement team provides save as you throw coordinator number of notices of violation and reason; and number of tickets/fines issued and reason.

#### Outreach Team

- Monthly, data coordinator provides outreach team with key trends in trash and recycling data, illegal dumping, and MC311 questions and requests to inform outreach goals, strategy, and target areas.

#### Customer Service Team

- Monthly, customer service desk provides a tally of MC311 complaints by priority issue (e.g., litter, missed collection, trouble getting new cart, etc.).

#### Billing Department

- Monthly, quarterly, and annually, the County billing department provides the County data lead the percentage of eligible households for which annual payment has been received.
- Annually, the billing department provides the data county lead with the number of carts purchased by size (e.g., 25% of households use 64-gallon carts).

#### **How Recommendation affects Residents:**

- Residents will receive “oops tags” for noncompliance. Residents who continue to be in noncompliance will receive a fine.

#### **How Recommendation affects Haulers:**

- Haulers will be required to have an onboard tracking system, real time data reporting, and to record data during collection, and provide outreach materials such as ‘oops tags’ on carts as needed.

#### **How Recommendation affects the County:**

- County will report to the SWAC and residents on a quarterly and annual basis about performance of program using the metrics described.
- County will identify data lead coordinator.

Most importantly, the tracking system needs to provide continual feedback on the progress of the program in helping the County reach diversion goals, and on problem areas that need timely adjustment. The (quarterly and) annual reports need to be reviewed for underperforming areas like lower diversion than expected, or higher can sizes that anticipated, or lags in cart deliveries or other bottlenecks that can harm the potential that SAYT provides for diverting significant new tonnages in Montgomery County.

## CHAPTER 3: PILOT PROGRAM RECOMMENDATIONS AND IMPLEMENTATION PLAN

In addition to the design and implementation plan for the County-wide roll-out of a SAYT program contained above, this study also developed a Plan for a pilot test. The pilot test is designed to identify and work out kinks in the design and implementation of the programs, outreach, carts and delivery, and identify key negative effects that may result from the program and need redesign or revisit prior to full County-wide rollout. Especially important outputs from the pilot include input into the likely demand for small and other sized-carts, and the tracking data that will provide an early estimate of whether the program's effectiveness in diverting tons may track with expectations – taking into account the differences between the design elements of the full County-wide implementation of the program and the areas of the pilot that could not perfectly replicate the full-scale design.

### 3.A Authorities and Impact Estimates - Pilot

The County has a precedent of conducting pilot tests for its important programs. The design of this pilot program does not include a change in SBC/RCF charges, but instead, offers gift cards as a proxy for savings on the SBC/RCF for selection of smaller carts. It is not anticipated that authority for this pilot is in question.

The remainder of this section provides estimates of the tonnage diversion, and the associated greenhouse gas reductions from the pilot program efforts are provided. In the Pilot's metrics and evaluation work, these values will be used to compare with actual pilot performance to determine if the program's design performed well, needs revision, or whether the program underperformed significantly against goals, and the SAYT roll-out is reconsidered.

#### 3.A.1 Estimated Reductions in Tonnage for SAYT Pilot Program

The SAYT pilot program is designed to mimic the full-scale program in order to inform program design and roll-out refinements, and to provide information on tonnage changes by material, based on real customer data. The pilot cannot completely match the full-scale SAYT program because the pilot cannot charge in the same way as the full-scale program. Enthusiasm and engagement cannot help but differ from a full-scale rollout, and the combination of the variations in the pilot vs. full-scale programs can result in greater-than-representative engagement, or less engagement. Additionally, the pilot area is demographically representative of Montgomery County as a whole but will not be comparable to or representative of every service area. The best estimate is that the diversion will be similar to that projected program-wide; however, the values for Subdistrict A should be used in the computations, as that is where the pilot is expected to be implemented. The percent diversion is reproduced in the box below; the tonnage is calculated as the <number of pilot households divided by all households times the total tonnage diversion> using data from Subdistrict A.

**Recommendation related to Estimated Tonnage Reduction from SAYT** → The County’s residential tonnage disposal is expected to decrease by 11 percentage points<sup>89</sup>, expressed as the percent of overall residential tonnage generated. The estimate includes 5.4 percentage points diverted to increased recycling, 0.4 percentage points to yard trim, and 4.5 percentage points are new source reduction. Tonnage estimates for the pilot test are 123 total tons in the first year (assuming all pilot homes are treated at one time) provided in the table after this box.

Elements / Steps to develop this estimate included:

- Consultants use the same estimate of percent recycling and composting behavior associated with Subdistrict A.
- Contractors use the tonnage projections for Subdistrict A, and scale to the pilot program that pilot collection consisting of one route of 850 households in the pilot.
- *The results of the pilot study will be used to refine the design of the full-scale implementation of SAYT, keeping in mind there will be some design/ delivery option differences between the pilot and full-scale roll-out because not all aspects cannot be replicated in the pilot study.*
- Implementation of the Results:
  - Consultants or county incorporate pilot results into improved estimates of tonnage flows and impacts on staffing and operations at facilities (discussed later).
  - The County or consultants use the updated information on tons (and carts) from the Pilot to adjust the full-scale SAYT rollout. These updated results are used in computations of the various elements of the SBC/RCF for solid waste services, including a new varying SBC that incorporates the SAYT volume-based incentive (discussed later).

**How Recommendation affects Households:**

- Variable pricing encourages households to set out less trash for collection, and more in other containers. They are also encouraged to make different decisions at the grocery store, and where possible, consider repairing items rather than disposing / replacing.
- Households participating in the Pilot receive a gift certificate in lieu of revised, incentive-based charges.

**How Recommendation affects Haulers:**

- Only one contracted hauler in Subdistrict A will be affected, including renegotiation of elements of the contract, delivery of containers.
- County will likely not need to reroute recycling for more tonnage per household for the small pilot.

**How Recommendations affect Facilities:**

- Less tonnage and processing costs related to trash; more tonnage, processing costs, and income from sales of materials in the recycling and composting streams.

**How Recommendation affects the County:**

- Finances will likely not change a great deal because the system does not change SBC/RCF fees; the costs of the gift cards will be a new cost (see discussion elsewhere).
- The tonnage losses in trash will exceed the increases in recycling and composting in the amount of new waste reduction / source reduction. Facility operations may be slightly affected.
- County outreach for this pilot will need to focus strongly on emphasizing the relationship between service level and *potential savings* to households in order to get customers to visualize the critical financial incentives for the SAYT program. In reality, however, in the pilot, this takes the form of a gift card, rather than changes in their SBC/RCF in the tax bill. See discussion in Customer Cart Choice Recommendations – Pilot.

**Timing:**

- Calculations provided up-front to drive the remaining analyses, and to provide a heads-up of the tonnage impacts on facilities, and the targeted outreach on incentives and options.

<sup>89</sup> County wide decrease is estimated at 10 percentage points. Subdistrict A (where the pilot is planned) is predicted to experience a slightly higher diversion.

**Figure 3.1: Estimated Tonnage Decrease for the SAYT Pilot Program:  
By Material and Total**

Material	Total incremental tonnage changes from SAYT Pilot
Trash	-123
Commingled Materials	16
Mixed Paper, OCC	45
Yard Trim	5
Scrap Metal	6
Ash	-37
Source Reduction	51
Total Tons Diverted	71
Total Tons Diverted and Reduced	123

*Table Note: Results for a scenario assuming the lower behavior change from the SAYT program are found in the model on tab, "Pilot Tonnage Estimates." The tons diverted from the alternate scenario in the pilot are 54, with total tons diverted and reduced estimated at 92.*

### 3.A.2 Assessing Extra Environmental Benefits from the SAYT Pilot – GHG Effects

SAYT incentivizes reductions in trash disposal and increases in recycling, composting, and waste reduction, and these changes affect greenhouse gas (GHG) emissions, in units of metric tons of carbon dioxide equivalent (CO<sub>2</sub>e). The reduction values are useful; multiplying these MTCO<sub>2</sub>e times one or more of the three leading market prices provides estimates of the dollar value of these environmental, health and other effects. The pilot test will divert material, and these actual diverted tons will allow an estimate of the GHG diversion and the value of these diversions for the Pilot program, which is easily valued using CO<sub>2</sub>e prices from EPA, the White House, or Stanford research values per metric ton. Recall that the estimate provided in this report is conservative.

**Recommendation related to Estimated Value of Avoided Greenhouse Gas (GHG) Emissions from SAYT in Montgomery County** → A conservative estimate of the Metric Tons of Carbon Dioxide equivalent (MTCO<sub>2</sub>e) emissions avoided due to the Pilot SAYT program is 194 MTCO<sub>2</sub>e per year. The annual dollar value of these reductions range from \$11,977 to \$54,626 per year<sup>90</sup>, depending on the market value used. This value represents additional environmental benefits attributable to the Pilot SAYT program. After the Pilot is completed, this estimate can be refined based on the actual tonnage shifts.

**Elements / Steps to develop this estimate included:**

- The consultants use the tonnage change figures for Subdistrict A computed earlier in the study, and multiply times the number of households in the pilot divided by the households in Subdistrict A. This value is reflected in the recommendation. This information can be used to estimate the value of the Pilot and in outreach information on the Pilot.

<sup>90</sup> The consultants also developed a less aggressive scenario for the effectiveness of the SAYT program. Less aggressive estimates 145 MTCO<sub>2</sub>e per year with total savings of \$8,982 to \$40,969.

<ul style="list-style-type: none"> <li>After the pilot is completed and the tonnage diversion estimate is refined, the consultants or County can rerun the WaRM model to refine the GHG MTCO<sub>2e</sub> estimates and the values that are used in decision-making and potentially for outreach.</li> </ul> <p><b>Implementation of the Results:</b></p> <ul style="list-style-type: none"> <li>Results are reported in MTCO<sub>2e</sub> and dollar terms, to help the County quantify the environmental effects of implementing the SAYT program and enhance the reporting of benefits and costs.</li> </ul>
<p><b>How Recommendation affects Households:</b></p> <ul style="list-style-type: none"> <li>No effect.</li> </ul>
<p><b>How Recommendation affects Haulers:</b></p> <ul style="list-style-type: none"> <li>No effect.</li> </ul>
<p><b>How Recommendations affect Facilities:</b></p> <ul style="list-style-type: none"> <li>No effect</li> </ul>
<p><b>How Recommendation affects the County:</b></p> <ul style="list-style-type: none"> <li>The additional information may allow a more enhanced review of benefits and costs from the SAYT program to support decision-making about the program.</li> <li>County outreach will need to focus strongly on emphasizing the relationship between service level and costs to households in order to establish the critical financial incentives for the SAYT program.</li> </ul>
<p><b>Timing:</b></p> <ul style="list-style-type: none"> <li>Calculations provided up-front to provide information for the pilot route.</li> <li>Calculations can be repeated after the Pilot to provide better information on the full-scale SAYT program, particularly for decision support and outreach materials.</li> </ul>

**Figure 3.2: Incremental GHG Emission from Recycling and Composting (MTCO<sub>2e</sub>) - Pilot**

Outputs from WARM_v15.1	Reduction in MTCO <sub>2e</sub> from recycling and composting from SAYT
Total GHG Emissions from Baseline MSW Generation and Management (MTCO <sub>2e</sub> ) <sup>91</sup> :	0.01
Total GHG Emissions from Alternative (Recycling and Composting) MSW Generation and Management (MTCO <sub>2e</sub> ):	-1.57
<b>Subtotal:</b> Incremental GHG Emissions from Recycling and Composting (MTCO <sub>2e</sub> ):	-1.58
Incremental tons (recycling, composting, SR) - Pilot	123
<b>Results:</b> Incremental reduction in MTCO <sub>2e</sub> from recycling, composting, and SR from SAYT - Pilot	194

**Figure 3.3: Value of MTCO<sub>2e</sub> Reduction from Recycling, Composting, and Source Reduction from SAYT - Pilot**

	MTCO <sub>2e</sub> Value in 2023 Dollars	Incremental reduction in MTCO <sub>2e</sub> from recycling, composting, and SR from SAYT - Pilot	SD A value of MTCO <sub>2e</sub> reduction from recycling, composting, and SR from SAYT - Pilot
Recycling, Composting, SR		194	
EPA <sup>92</sup>	\$61.74		\$11,977

<sup>91</sup> Montgomery County reported factor for combustion is 0.01.

<sup>92</sup> EPA - [https://www.epa.gov/sites/default/files/2016-12/documents/social\\_cost\\_of\\_carbon\\_fact\\_sheet.pdf](https://www.epa.gov/sites/default/files/2016-12/documents/social_cost_of_carbon_fact_sheet.pdf); White House - [https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument\\_SocialCostofCarbonMethaneNitrousOxide.pdf](https://www.whitehouse.gov/wp-content/uploads/2021/02/TechnicalSupportDocument_SocialCostofCarbonMethaneNitrousOxide.pdf); Stanford - <https://news.stanford.edu/2015/01/12/emissions-social-costs-011215/>



	MTCO2e Value in 2023 Dollars	Incremental reduction in MTCO2e from recycling, composting, and SR from SAYT - Pilot	SD A value of MTCO2e reduction from recycling, composting, and SR from SAYT - Pilot
Recycling, Composting, SR		194	
White House	\$88.64		\$17,195
Stanford	\$281.60		\$54,626

### 3.B Modifying Collection - Pilot

The pilot program is expected to take place in Subdistrict A, requiring changes in collection for one trash route for the existing contractor.

#### 3.B.1 Pilot Rollout Recommendations

The study presented strong arguments for both a phased-in approach of the overall SAYT program implementation and for a pilot test of the system. To ensure an effective SAYT program roll-out, the County selected the pilot test as its preferred option, with the test area occurring on a route in Subdistrict A, as Subdistrict B's trash collection is not currently administered via County contracts. The total cost of the 12-month pilot is estimated to be \$241,000 and the pilot budget is included in the supporting model<sup>93</sup>. The goal of the pilot program is to gauge changes in waste generation and disposal, gain insight on cart size distribution and contamination issues, and evaluate customer service efficiency. The County will incentivize residents to choose the properly sized trash cart by providing gift cards to households at the end of the pilot based on the size of trash cart the household chooses. The gift card amounts are of similar proportion and are based on the cost savings recommended for the SAYT full program. Based on representative socioeconomic factors in the county, including median household income, household size, and number of rooms per residence, the recommended routes for the SAYT pilot program can be found in the figure below<sup>94</sup>. Route RE04W02 is most statistically similar to the demographics of Montgomery County and is the recommendation of the project team.

**Figure 3.4: Representative Route Options for SAYT Pilot Program for A&B**

Route Number	Median Number of Rooms	Median Household Income	Average Household Size	Collection Day
Montgomery County	6.2	\$112,854	2.7	n/a
RE02M03	6.0	\$117,272	2.9	Monday
*RE04W02	6.1	\$112,676	2.6	Wednesday

<sup>93</sup> See tab, "Pilot Costs."

<sup>94</sup> IF the SAYT program is going to be implemented after the food scrap program goes county-wide, then a case can be made for implementing the pilot on the food scraps pilot route, as it will test a system that is more like the situation in place for roll-out. Note that the estimated impacts presented in this report will not apply. However, if the food scraps program is not going county-wide, or if there will be a long period between the introduction of SAYT and (later or never) the food scraps program, then a route different from that pilot-testing food scraps should be used. Recall also that it is far better to implement the food scraps program before or concurrent with the SAYT program; it will not work to implement the SAYT program, and then shortly after, implement the food scraps program. The disruptive effects on carts and household decision-making will cause a significant backlash and significant extra costs from mis-ordered / delivered carts.



Route Number	Median Number of Rooms	Median Household Income	Average Household Size	Collection Day
RE05F02	6.6	\$118,082	2.6	Friday
RE05W04	6.3	\$102,698	2.9	Wednesday
RE06W04	6.1	\$115,175	3.0	Wednesday
RE08M02	6.4	\$116,870	3.0	Monday
RE11W03	6.1	\$119,239	2.9	Wednesday

**Recommendation for Pilot** → Conduct 12-month pilot<sup>95</sup> to gauge changes in waste generation and diversion, gain insight on contamination issues, and evaluate customer service efficiency.

Elements / Steps include for pilot implementation:

- County assigns staff lead.
- County and hauler select Route RE04W02, which has 850 households, in Subdistrict A for pilot. Selected given its similarity to Montgomery County demographics. If needed, additional pilot route options are available above in Figure 3.4.

**Timing: 6 months prior to pilot.**

- County holds preliminary meeting with participating hauler to explain pilot and planning timeline. Discuss compensation for hauler for cooperating with County to run pilot (recommend \$3/household/month). Hold preliminary public neighborhood meeting to talk about the pilot, how it will work, timing, the benefits of SAYT, and when to expect to choose cart size. Launch education web page and pilot-specific email address.

**Timing: 5 months prior to pilot.**

- Hauler determines if existing trucks support semi-automatic collection for pilot or if trucks need to be leased. If trucks do not support semi-automatic collection, consider choosing different pilot route with hauler that can support semi-automatic collection (representative routes listed in Figure 3.4 of this report). Hauler and County determine data tracking capabilities and reporting capabilities for pilot.

**Timing: 4 months prior to pilot.**

- County sends letter(s) to homeowners on pilot route to select which garbage cart size they will utilize for the pilot (see Pilot Customer Cart Choice). Residents participating in the program who opt for a 32-gallon cart will receive a \$90 gift card at the end of the pilot, a 64-gallon cart will receive a \$65 gift card at the end of the pilot, a 96-gallon cart will receive a \$50 gift card at the end of the pilot, and two 96-gallon carts will receive a \$30 gift card at the end of the pilot<sup>96</sup> to incentivize participation. If a household switches to a smaller cart during the pilot, they will receive the gift card amount corresponding to their new choice<sup>97</sup>.

**Timing: 4 months prior to pilot.**

- County establishes baseline metrics and performance. Determine metrics through reviewing proposed metrics and through reviewing hauler capabilities (see Section Pilot Program Evaluation Recommendations - Pilot). Develop baseline.

**Timing: 3 months before pilot.**

- County reviews outreach and education and non-compliance plan for pilot (section Education and Outreach - Pilot). County ensures MC311 has information on participating pilot households in order to track calls specifically about pilot.

<sup>95</sup> The Project Team initially recommended a 9-month pilot but Montgomery County staff wanted to ensure the pilot spanned the length of all the seasons to more accurately gauge trash and recycling generation.

<sup>96</sup> The County may not want to wait for the entire year for the rebate amount for the pilot – people move, and it may seem too far off for a pilot. Perhaps a rebate after 6 months and again after 12 months.

<sup>97</sup> The County has inquired about matching the gift card amounts to the incremental changes in the SBC as follows: Updated Incremental SBC (annual): 32 gallons = \$260, 64 gallons = \$130, 96 gallons = \$0. Incremental SBC (monthly): 32 gallons = \$22, 64 gallons = \$11, 96 gallons = \$0. Updating the gift card amounts will significantly increase the cost of the pilot to the County.

**Timing: 3 months before pilot.**

- County purchases trash and recycling carts. Purchase trash bags for excess trash generation (2 trash bags provided per household on pilot route for use during the entire pilot; limit 32 gallon in size; heavy-duty bag encouraged)<sup>98</sup>.

**Timing: 6 months prior to pilot.<sup>99</sup>**

- County distributes new trash (with 2 trash bags included for excess trash) and recycling carts and collects current carts and bins for resident pilot participants. For residents who do not respond after 2 attempts at reaching them, provide them with the 32-gallon cart.

**Timing: < 1 month prior to pilot.**

- County and hauler roll-out pilot. Hold weekly internal meetings to gauge success/address issues as they arise. County field team conducts sets out survey on ~ 20% of pilot households each month and leaves targeted outreach materials on carts such as Oops Tags. See pilot program evaluation.

**Timing: First month of pilot.**

- **Pilot implementation:** County addresses issues as they arise. Review monthly and quarterly performance data.

**Timing: Ongoing throughout pilot.**

- **Pilot completion:** County sends letter to participating residents and share plan for collecting pilot carts and returning previously sized carts. Distribute survey to residents on pilot experience.
- Collect pilot carts and return old recycling and trash containers.

**Timing: 1 week after pilot concludes.**

- **Pilot evaluation:** County evaluates pilot data compared to other county data to evaluate performances. Evaluate lessons learned, best practices, and common questions asked by residents participating. Share data with County leaders and other stakeholders.

**Timing: 1 month after pilot concludes.**

**How Recommendation affects Residents:**

- A small group of residents (850 households) will be affected by the pilot program and will be required to participate. Residents must choose cart size and comply with use.

**How Recommendation affects Haulers:**

- Hauler will need to participate in pilot.
- Hauler will pick up trash and recycling and collect tonnage and contamination data on the 850 households.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County will need to educate households and provide incentive gift card.
- County will need to analyze data and assess pilot successes to incorporate into program implementation.

### 3.C Processing & Facility Impacts - Pilot

The next sections discuss the impact and implementation plan for the processing and facility impacts from the Pilot program.

<sup>98</sup> Households who produce excess trash beyond the two 32-gallon bags will need to request a larger cart size. See Section Modifying Bulky Waste Pickup and Drop off Options Recommendations – Pilot.

<sup>99</sup> This timing could be faster if current County cart vendor, Rehrig, has carts readily available in inventory. County regularly orders cart replacements from vendor.

### 3.C.1 Processing Site Changes Recommendations – Pilot

The pilot should not have any noticeable operational or procedural effects to Montgomery County facilities as the pilot is affecting only 850 households.

**Recommendation for Processing Sites for Pilot** → Scale tickets with tonnages for pilot route from disposal and processing facilities required to be reported monthly to the Montgomery County Department of Environment by recycling processing and disposal contractors. No change required for facility operations procedures, staffing, or hours.

Elements / Steps to include for Changes to Processing Sites for Pilot:

- No changes needed to processing facilities for pilot. Since only one route will be participating in the pilot, processing facilities can absorb changes in tons processed without changes in working hours, staffing, or operating days.
- Scale house at disposal and processing facilities should track and report the following monthly for the pilot route: date, time, truck number, route number, net tons, material type, contamination, Facility Name

**How Recommendation affects Residents:**

- No impact.

**How Recommendation affects Haulers:**

- No impact.

**How Recommendation affects the County:**

- No impact.

### 3.C.2 Modifying Bulky Waste Pickup and Drop off Options Recommendations – Pilot

Given the small pilot area and limited time frame, the Project Team does not anticipate needing to make any changes to the way bulky waste is collected or the way the drop off options are structured.

**Recommendation for Modifying Bulk Waste pickup and drop off options for Pilot** → County maintain service level status quo for bulky waste pickup options and transfer station trash drop off during SAYT pilot.

Elements / Steps include:

- Since the pilot affects only the 850 households on the selected pilot route, the recommendation is for the County to maintain the status quo for bulky waste pickup options (5x/year by request) and free trash drop off at transfer station.

**Timing: Ongoing leading up to and throughout pilot**

- County build in messaging (see section Education and Outreach - Pilot) during SAYT pilot outreach to households on pilot route that conveys:
  - Why SAYT is important, and residents should be mindful of trash they are generating
  - To utilize the provided trash bags for excess trash generated during the pilot
  - To upsize trash cart if excess trash is a recurring issue (there should be no additional excess trash bags issued after the 'free' two)<sup>100</sup>

<sup>100</sup> Note that pilot route households will technically still be able to use the TS to drop off trash for free. The County will need to ensure education is focused on why the pilot is important and the ideal way to manage excess trash, as recommended in section 3.D.3 of this report.

- In post-pilot survey to residents, County ask about transfer station use during pilot (if any occurred, estimation of amount of material dropped off, etc.)

**How Recommendation affects Residents:**

- Households on the pilot route will still be able to access the same level of service for bulky waste and trash drop off. Residents will understand options for disposing of excess trash. Residents will understand how to upsize their trash cart if needed.

**How Recommendation affects Haulers:**

- Hauler will collect excess trash placed beside trash cart in county-provided trash bag<sup>101</sup>.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.
- County maintains current service level for bulky trash pickups and trash drop off at transfer station.
- County will need to carry out Pilot Education and Outreach recommendations.

### 3.D Mitigating Effects - Pilot

Mitigation of some impacts is difficult for a pilot program covering only about 850 households. These individual effects are discussed below.

#### 3.D.1 Mitigating Recycling Contamination Recommendations – Pilot

The County should continue to execute its robust education and outreach initiatives to inform the community, including the pilot route, about how to recycle properly. As County staff are doing monthly route checks, it should tag carts that contain obvious contamination. The County should provide haulers with “oops tags” to tag and track any obvious contamination when running weekly routes.

**Recommendation for mitigating recycling contamination along pilot route** → County maintain up-to-date recycling information, continue cart-tagging program, and implement consequences for repeat offenders.

Elements / Steps include:

- The County should continue robust education on what is and is not recyclable. See Education and Outreach recommendations for more details, but the main recommendations are:
  - County website includes easy-to-find and updated information on how to recycle properly
  - County translates outreach material to include Spanish and Mandarin at a minimum
  - County works with contracted hauler to make sure hauler website is updated with proper recycling information

**Timing: 3 months prior to pilot and ongoing throughout.**

- The County should, on a monthly basis, conduct a set-out survey of a minimum of 170 households on pilot route. See Tracking and Metrics Recommendations for more information on metrics and tracking procedures associated with contamination. County use “oops tags” to tag contaminated carts along pilot route during monthly surveys.
  - County works with contracted recycling haulers to keep “oops tags” in truck for obvious contamination issues and hauler records service address and takes photo of contamination when hauler is running pilot route.

**Timing: Ongoing throughout pilot.**

**How Recommendation affects Residents:**

- Residents will have a clear understanding of what is and is not recyclable in Montgomery County. Residents will receive information on improper recycling through “oops tags”.

<sup>101</sup> Households who produce excess trash beyond the two 32-gallon bags will need to request a larger cart size.

**How Recommendation affects Haulers:**

- Haulers will need to be proactive in flagging any obvious contamination along pilot route via “oops tags” and reporting to County with this information.

**How Recommendation affects the County:**

- County will need to implement education and outreach recommendations to mitigate contamination and make sure residents along pilot route know what is and is not recyclable.
- County will need to track contamination issues at service addresses along pilot route.

### 3.D.2 Mitigating Litter and Illegal Dumping Recommendations – Pilot

Given the small pilot area and limited time frame, the Project Team does not anticipate needing to make any changes to the way illegal dumping is addressed. To address overflowing containers, which may cause increased litter, the Project Team recommends a simple solution of including two excess trash bags per household. Households also have the ability to right size their container throughout the pilot.

**Recommendation for Mitigating Litter and Illegal Dumping during pilot** → County address overflowing containers on pilot route. County maintain status quo during pilot for bulky trash pickups (up to 5x/year/household by request).

Elements / Steps include:

- Overflowing trash and recycling containers can be a source of litter, and the County should implement recommendations to address overflowing containers (in section Mitigating Overflowing Containers - Pilot).

**Timing: Ongoing throughout pilot**

- County maintain status quo during pilot for bulky trash pickups. See section Modifying Bulky Waste Pickup - Pilot for recommendations on bulky trash during pilot.

**Timing: Ongoing throughout pilot**

**How Recommendation affects Residents:**

- Residents along pilot route will receive information on how to dispose of occasional excess trash and guidance on rightsizing their cart.
- Residents along pilot route will have the same access to bulky trash pickups as they have always had.

**How Recommendation affects Haulers:**

- Hauler will maintain status quo for bulky trash pickups.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above.
- County will educate residents along pilot route on excess trash and bulky waste options.

### 3.D.3 Mitigating Overflowing Containers Recommendations - Pilot

There are times – perhaps around the holidays or if they had a large social gathering – when a resident might have occasional excess trash that does not warrant a larger permanent trash container. Conducting a pilot warrants a simple solution to address this, and the Project Team recommends distributing excess trash bags when distributing the new trash carts. Additionally, the County should encourage pilot households to right size their trash container at any point during the 12-month pilot.

**Recommendation for Mitigating Overflowing Containers during Pilot** → County address overflowing containers by providing a vehicle for additional waste. When distributing carts, County also provides 2 free bags for excess trash to households on pilot route. Bags should be uniform in size, 32 gallons or less, and provided by the County to pilot households during cart distribution.

Elements / Steps include:

- County decide on bag type (heavy duty, uniform in size and shape) and size (32 gallons or less) to give to pilot households for additional trash should residents need it. Purchase bags and provide pilot hauler with information on county-authorized excess trash bags.  
**Timing: 3 months prior to pilot.**
- County allow option for households to request additional recycling carts as needed throughout pilot and keep track of requests. Allow option for households to switch trash cart sizes if needed and keep track of requests (see Pilot Cart Size Choice). Utilize pilot-specific email address for these requests.  
**Timing: Ongoing throughout pilot.**
- County staff lead for pilot coordinate with hauler to select one day/month to survey at least 170 households ahead of trucks for tracking purposes.  
**Timing: 1 month prior to pilot.**
- County ensure trash carts delivered to pilot households contain 2 bags for excess trash. Should residents need more than the provided bags, they have the option to upsize trash carts (see Pilot Cart Size Choice).  
**Timing: One week prior to pilot start date.**
- County staff continue to monitor routes monthly and measure items mentioned above. County staff respond to resident requests for additional recycling carts or need to switch trash cart sizes.  
**Timing: Ongoing throughout pilot.**
- County staff provide outreach via letter and “oops tag” to households who consistently have overflowing containers explaining the options for upsizing trash cart.  
**Timing: Ongoing throughout pilot.**

**How Recommendation affects Residents:**

- Residents on pilot route will understand steps to take for excess trash. Residents will understand options for right sizing their trash and recycling containers. Residents will be able to communicate with County via pilot-specific email address.

**How Recommendation affects Hauler:**

- Hauler will need to understand the purpose of excess trash bags.
- Hauler will need to coordinate with County staff lead to select monthly route checks.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County will need to educate residents along pilot route about options for excess trash and changing trash cart sizes or requesting additional recycling carts.
- County will need to procure bags for excess trash and distribute with new trash carts.
- County will need to track information on cart requests, excess trash set-outs, etc.
- County staff lead will coordinate with pilot hauler to select monthly route checks.

### 3.D.4 Mitigating the Effects of SAYT on Low Income Customers in the Pilot

SAYT may be perceived to negatively affect low-income households<sup>102</sup> and the RFP for this project indicated these types of policy considerations are relevant to Montgomery County. The statistics on the number of households likely to be low-income, and support a test of methods for low-income strategies,

<sup>102</sup> Interested households can apply to the County for an additional gift card. County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County’s traditional metric for other services).

is likely limited. Limited means even ad hoc strategies (extra gift cards or other tailored strategies) are feasible, because the one-on-one is likely a small number. However, that small sample works against the transferability of the low-income procedures to large-scale application of a county-wide program.

**Recommendation for Mitigating Effects of SAYT on Low Income Customers for the Pilot** → For the pilot program, the recommendation is to test the very basics of a reduction in charges for the smallest container for low-income customers. Information is provided on how to apply for the discount, and a second \$10-\$20 gift card is provided for qualified homes on the pilot test route.

Elements / Steps include:

The structure for billing for the SAYT program is not well suited to either true test changes in charges based on cart selections (see section on SBC/RCF charges below), or to discounts for low-income customers. Instead, the pilot test will function as follows.

- County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County's traditional metric for other services).
- County staff develops an application portal, application paperwork and a qualification system prior to start of the pilot.
- County develops paperwork for interested pilot households to complete to apply for the discount. County sets up a request procedure, and distributes the paperwork to those requesting the information.
- County staff develops outreach detailing qualifications for receiving a low-income discount on the pilot test.
- County reviews the paperwork submitted by any applicants (there may not be many applicants on an 850 household route).
- For those qualified homes that request the smallest cart, a second gift card (\$10-\$20) is mailed.
- The pilot test serves as a small pilot on procedures for and reactions to special discounted charges for low-income households in the full-scale program roll-out.

**How Recommendation affects Residents:**

- Households receive information on additional discounts (extra gift cards) available to qualified low-income customers.
- Households that wish to qualify submit supporting paperwork, and the County tests its administrative system for qualifying any applicants.
- Qualified households that select the smallest cart size receive an additional gift card.

**How Recommendation affects Hauler:**

- No change.

**How Recommendation affects the County:**

- County conducts outreach, including information on income-qualified discounts.
- County selects the qualification it wishes to use for low-income qualification (e.g., County SNAP or HUD or the County's traditional metric for other services).
- County develops paperwork for interested pilot households to complete to apply for the discount. County sets up a request procedure, and distributes the paperwork to those requesting the information. County reviews the paperwork submitted by any applicants (percentage may be as low as 8 qualified homes in the route).
- For those qualified homes that request the smallest cart, a second gift card is mailed.

**Timing:**

- Develop the procedures and outreach materials at least 6 months prior to roll-out of the pilot test.

### 3.E Outreach - Pilot

Outreach for this pilot test must be extremely focused. The pilot covers only one route, so it will be important for information to remain targeted and not bleed over to other neighborhoods. The outreach must be effective for this target area, which will have several features that do not perfectly mimic the plan for the County-wide roll-out. This includes the lack of a billing-based charge incentive in favor of a short-term proxy of a gift card. The pilot design and implementation plan balances as close a match as possible against the realities of what can be accomplished for one route, surrounded by many others, for a short time.



### 3.E.1 Customer Cart Choice Recommendations – Pilot

Residents whose homes are on the selected routes will be required to participate in the SAYT pilot program. To facilitate their participation, the county will need to purchase variable size garbage carts to be leased to the 850 homes that are selected on each route, in addition to recycling carts to replace the current recycling bins. The county will need to buy trash and recycling carts from cart manufacturers and work with haulers to distribute the carts to the recommended routes.

**Recommendation for Customer Cart Choice Process for Pilot** → Have three different options for homeowners on pilot route to choose the size of their cart: online web form, paper form that can be e-mailed, and by calling MC311. Allow one cart size increase per household throughout pilot period (12 months). Households can decrease cart size at any point throughout pilot period and receive the higher value gift card.

Elements / Steps include:

- County creates form structure with information needed from homeowners on pilot route. Having a variety of ways homeowners can notify the County of their cart choice is key for inclusivity and flexibility. The form should also be in English, Spanish and Mandarin. Information to collect and convey on the form:
  - Collect: homeowner/household name, service address and account number (optional), phone number, email address, cart container size choice (32-gallon, 64-gallon, 96-gallon, 96-gallon x2)
  - Include information on gift card incentive (sent at the conclusion of the pilot) for choosing the different cart sizes (\$90 for smallest 32-gallon cart, \$65 for 64-gallon cart, \$50 for 96-gallon cart, \$30 for two 96-gallon carts)
  - Remind homeowners that recycling is still included and that they will get an additional recycling cart to replace the comingled container bin
  - Remind homeowners that they are not paying anything additional to participate in the pilot
  - Deadline to respond. If homeowner/household does not choose a cart size by deadline, they will automatically receive a 32-gallon cart<sup>103</sup>
  - Include pilot-specific email address and MC311
  - Mention that occasional excess trash can be put in bags included in carts when delivered

**Timing: 4 months prior to implementation.**

- County creates rightsizing guidelines for homeowners to include on paper and web form. Include photo of person next to cart sizes for reference.
  - If household generates 2-3 bags (13-gal tall kitchen bags) of trash or less per week: 32-gallon
  - If household generates 4-5 bags (13-gal tall kitchen bags) of trash per week: 64-gallon
  - If household generates 6-8 bags (13-gal tall kitchen bags) of trash per week: 96-gallon
  - If household generates more than 8 bags (13-gal tall kitchen bags) of trash per week, they will need an additional trash cart

**Timing: 4 months prior to implementation**

- County sends letter with the information in Step 1 to homeowners on pilot route. County creates and disseminates door hangers to households on pilot route. Give homeowners **6 weeks** to respond to cart choice request. (See Education and Outreach for Pilot recommendations).
- County tracks cart requests in database of service addresses and send reminder letter **two weeks prior to deadline** to addresses that have not responded.
- If homeowner does not respond by deadline, automatically assign them a 32-gallon cart. Since County will distribute both trash and recycling carts to pilot households, County will maintain database of service addresses and cart choices to ensure smooth delivery by County.

**Timing: One week prior to pilot start date**

- For cart exchanges, households can upsize their cart once during the pilot period (9 months). Households can decrease their cart size at any point during the pilot and receive a gift card incentive.

**Timing: Ongoing throughout pilot**

**How Recommendation affects Homeowners/Households:**

- Homeowners on pilot route will have a clear understanding of their cart options and will receive guidance from the County on rightsizing. Homeowners on pilot route will have a variety of ways to make their cart choice. Households on pilot route will understand their options to switch cart sizes after pilot begins.

**How Recommendation affects Haulers:**

- No effect on haulers.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County will need to develop online and paper forms for households on pilot route. County will need to send informational letter and disseminate door hanger to all households on pilot route.
- County will track household cart choice correlating to service address and County will deliver trash and recycling carts to households on pilot route.

### 3.E.2 Education and Outreach Recommendations – Pilot

The pilot program must be coupled with educational efforts for the households participating to ensure a smooth transition from their current services to the SAYT program. Because the pilot is a small number of households compared to the County as a whole, the education and outreach efforts should be more engaging to get the right information to the right households on the specific pilot route. Outreach techniques such as using door hangers and hosting neighborhood meetings will help ensure that pilot households have the proper information they need to participate in the pilot. Ensure residents are

**Recommendation for Education and Outreach for Pilot** → County craft new messaging and outreach specific to SAYT pilot. Communicate pilot details and ‘asks’ directly to pilot households. Disseminate general messaging on pilot for whole county.

Elements / Steps to include:

- County conducts focused meetings with hauler to address specific concerns around a pilot program. Create talking points and brief upper management and elected officials on benefits of SAYT, as well as any pain points that came from focus group conversations that they should be aware of. Include information on why the County is conducting a pilot before full implementation.

**Timing: 6 to 9 months prior to pilot.**

- County develops and launches SAYT pilot webpage with pilot details. Create pilot-specific email address. Include pilot area map. Create door hanger for households on pilot. Begin communicating with homeowners through mailers and neighborhood meetings with pilot households. Create an online and paper form where household can select their cart size. Design labels for new recycling and trash carts. Develop 311 Knowledge Based Articles on SAYT pilot.

**Timing: 5 months prior to pilot.**

- County creates and sends letter to pilot households with more detailed information on the pilot and instructions to choose a trash cart size by a certain date (give 6 weeks to respond). Include link to online form, as well as a paper version of the form. Clarify that residents will receive 32-gallon trash cart if they do not respond to form. Include information on how to handle excess trash generation and why it is important to right-size their trash cart. Include information on additional recycling cart households will receive. Include information on gift card incentives for choosing smallest bin or sizing down during pilot.

**Timing: 4 months prior to pilot.**

- **Two weeks prior to deadline** to respond to cart choice, send reminder letter to households who have not chosen cart size.
- County develops other outreach material (e-news article, media release, etc.) to notify the community of the pilot and why it is being implemented. Maintain open feedback loop with residents by creating a pilot-specific email address and web form.  
**Timing: 4 months prior to pilot.**
- County send pilot households letter to remind them of why their participation in the pilot is important and how SAYT can work for them. Include information to target any issues experienced (contamination, etc.).  
**Timing: 4-to-6 months into pilot.**
- County survey pilot households to learn about what worked and what did not work well, changes in perceived trash generation, use of other County solid waste services (e.g., transfer station), changes in perceived recycling generation (e.g., “did you notice your recycling increasing?”). Ask if in the end, they would have chosen a different sized cart. Incentivize survey participation with possibility of winning a gift card.  
**Timing: 1 week after pilot concludes.** If pilot continues past the 12-month mark, survey every 6 months after one year.
- County work with hauler and work through data from pilot. Synthesize data. Report back to pilot households and use information to inform full program implementation, messaging, and refinements. Develop outreach material around successes and lessons learned from pilot, as well as anticipated full implementation date.  
**Timing: 1 month after pilot concludes.**

**How Recommendation affects Residents:**

- Residents on the selected pilot route will receive information pertaining to the SAYT pilot to better understand next steps and how to participate.
- Residents will be notified that they must select a trash cart size and that they will receive a new recycling cart.
- Residents will be able to get answers to their questions through webpage and other outreach material.
- Residents will understand the reason for the switch to SAYT.

**How Recommendation affects Haulers:**

- County should be in a feedback loop with hauler to address any concerns and receive data on pilot.

**How Recommendation affects the County:**

- County staff needed to carry out the steps above. County already has a robust education and outreach team capable of producing high-quality outreach materials.
- County analyzes data and assesses pilot successes; communicate this to County leaders and other stakeholders.
- County to provide outreach to pilot households before, during, and after the pilot takes place.

### 3.F Billing and Charges – Pilot

The pilot program covers only one route of about 850 households. Many elements can be made to align with the County-wide rollout, but the billing system and charge structure are not easily tested. The alternate design elements for the pilot test households are described below.

#### 3.F.1 Estimated Cart Subscriptions for Trash Cart Sizes for the Pilot Program

Cart subscriptions are likely to be requested, rather than estimated, in the Pilot Test, and up-front estimates are not needed for uses related to charge computations, as the Pilot test does not charge

actual price differences between can size selection. The SBC/RCF Charge calculation results from the Full-Scale implementation for Subdistrict A are used in the outreach materials on the Pilot Program, in order to represent likely SBC/RCF differentials for a full-scale rollout.

<p><b>Recommendation for Trash Cart Size Service Level Requests (pilot)</b> → The estimates for percent of households selecting each size of trash cart are: 54% on 32 gallons, 28 % on 64 gallon, 16% on 96 gallon, and 2% on more than 96 gallons (second cart).</p> <p>Elements / Steps included:</p> <ul style="list-style-type: none"> <li>• Consultant / County provides the estimates for Subdistrict A’s estimated container distribution, and the cost differentials represented by each choice.</li> <li>• <i>The results from the pilot test will be used to improve the estimates for the full study, with the resulting refinements in the up-front cart orders, cost to purchase carts, and SBC/RCF estimates for SAYT.</i></li> </ul> <p><b>Implementation of the Results:</b> The results from the Pilot study are used to improve the information for the full-scale implementation:</p> <ul style="list-style-type: none"> <li>• They are used to develop refined estimates of the cart distribution and cost of purchase of new carts for the SAYT system, and</li> <li>• Revised subscription results are also vital in the charge setting steps for the full-scale SAYT program (discussed in a later section).</li> </ul>
<p><b>How Recommendation affects Residents:</b></p> <ul style="list-style-type: none"> <li>• Households on the pilot route need to receive ample education about the annual financial savings associated with different can sizes, achieved through greater recycling, and waste diversion and must consider options based on tradeoffs between savings and behavior change, and choose a continuing cart size.</li> </ul>
<p><b>How Recommendation affects Haulers:</b></p> <ul style="list-style-type: none"> <li>• No changes at this point; however, the results from the expected distributions will affect cart ordering (discussed later), and charge-setting tasks (discussed later).</li> </ul>
<p><b>How Recommendation affects the County:</b></p> <ul style="list-style-type: none"> <li>• County needs to provide extensive public education during the rollout of the pilot test so residential in the pilot route in subdistrict A to allow households to make informed choices.</li> <li>• The Consultants or County staff will use the actual can size selections from the pilot program to refine estimates used for cart orders, estimated program costs, and SBC/RCF charge setting for the full-scale program.</li> </ul>
<p><b>Timing:</b></p> <ul style="list-style-type: none"> <li>• Information on the full-roll-out SBC differentials are provided to the pilot households to inform their cart selections.</li> <li>• Actual pilot program cart selections are monitored, and are then used to refine the computations of the full-rollout program’s estimates of cart costs and SBC charge differentials.</li> </ul>

**Figure 3.5: Projected Percent of Customers by Cart Size**

Pct on	Projected Subscriptions by Cart Size
32 gal	54%
64 gal	28%
96 gal	16%
>96	2%

### 3.F.2 Method of Billing and Charges for the SAYT Pilot Program

The County’s SAYT pilot program is planned to be conducted in only one route in Subdistrict A. It cannot use County’s current County-wide tax-based billing system to vary the charges for this group of 850 households. The recommended approach for the SAYT pilot, previously mentioned, is described below.

<p><b>Recommendation for Billing and Charges for the SAYT Pilot</b> → Households selecting smaller containers, and those moving to smaller containers during the pilot, receive gift certificates of a higher value as a proxy for receiving lower SBCs for use of smaller carts. The only set up for this system is that the Solid Waste Department, in cooperation with the Department of Finance and Division of the Treasury, 1) receives requests for cart sizes, 2) delivers the carts; 3) purchases and delivers gift cards to the relevant households, and 4) collects carts at the end of the pilot test.</p>
<p>The recommended charge-for-service is outlined above. The recommendation is \$90 gift card (SBC charge-reduction proxy) for those selecting small sized carts (32-gallon), and down to a \$30 gift card for selecting the largest cart volume (2 96-gallon carts). If a household requests a smaller cart during the conduct of the pilot test, they receive the new corresponding gift card amount to reflect the savings in SBC they would receive under a full-scale roll-out<sup>104</sup>.</p>
<p><b>How Recommendation affects Residents:</b></p> <ul style="list-style-type: none"><li>• Residents receive a small incentive for reducing their service level and making the supporting behavior changes.</li></ul>
<p><b>How Recommendation affects Hauler:</b></p> <ul style="list-style-type: none"><li>• No change.</li></ul>
<p><b>How Recommendation affects the County:</b></p> <ul style="list-style-type: none"><li>• Costs and administration incurred for the value of the gift cards to the percent of the 850 pilot homes that initially select, or later move to, small containers.</li></ul>
<p><b>Timing:</b></p> <ul style="list-style-type: none"><li>• Set up the systems up front at least 4 months prior to advertising or implementing the pilot; issue cards at the end of the pilot for those changing service level downward.</li></ul>

### 3.G Tracking and Refinement - Pilot

#### 3.G.1 Pilot Program Evaluation Recommendations – Pilot

Data collection during the pilot phase will assist in program evaluation and planning for full implementation. Additionally, data collection teams will assist with outreach to participating households through tagging non-compliant carts and identifying issues as they arise to ensure a successful pilot program.

<p><b>Recommendation for Pilot Program Evaluation</b> → Establish baseline metrics and conduct an ongoing evaluation of the pilot to forecast program impact on tonnages collected, changes to collection routing and processing facility staffing and operating days, cart sizes for procurement, and to understand experience and support of the program by participating households.</p>
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<sup>104</sup> The County may not want to wait for the entire year for the rebate amount for the pilot – people move, and it may seem too far off for a pilot. Perhaps a rebate after 6 months and again after 12 months.

Elements / Steps to include for Pilot Program Evaluation:

- County sets up excel file to be used to manage and track pilot data and designed to include with automatic charts and figures to facilitate automatic comparisons.
- County tracks number and percent of each cart selected from pilot sign up records and compare with baseline and performance projections in the report to inform future procurement of carts for program roll-out.
- One month prior to pilot rollout, County establishes baseline metrics with an initial set-out survey<sup>105</sup> of 170 households (20 percent of pilot route) to track number of trash and recycling cans set out, visible contamination, and percentage cans are full. Hauler provides County with tonnage information for both trash and recycling for the pilot route.
- County holds weekly internal meetings to gauge success and address issues as they arise.
- On a monthly basis, County tracks any adjustments in cart size made by households participating in the pilot, both for distribution information and gift card information.
- On a monthly basis, County conducts set out survey for a minimum of 170 households on the pilot route for trash can compliance, recycling and yard trim contamination, and trash, recycling and yard trim volume and frequency of set outs. Tag carts using “oops tags” for contaminated carts or warnings for carts that do not meet compliance, and these should be distributed by the survey team and noted in survey data. Compare to 2022 set out survey findings included in this report. Use procedures described in set out survey for selecting households to audit (see Appendix C: Set-Out Field Survey).
- Hauler servicing pilot route provides scale tickets daily for each broad material type (containers and fiber).<sup>106</sup> Tickets will be utilized to calculate the following: lbs. per household recyclables collected curbside per year, lbs. per household trash collected curbside per year, lbs. per household bulky waste collected curbside per year, and lbs. per household of yard trim collected curbside per year. Data can be compared to route data from the pre-pilot survey, data from the previous month and set out data from this report to establish performance results.
- County use data collected to calculate lbs. per household of curbside waste generated per year (trash, yard trim, bulky waste, recyclables) (see report for calculation methodology.).
- If performance is high after the first three months, household/cart audits could transition from monthly to every other month.
- Conduct online survey of households participating in pilot to gauge their satisfaction with the program and receive feedback on areas of improvement. Conduct survey at end of pilot. If the pilot continues or expands past the 12 months, survey participants every 6 months afterwards.

**How Recommendation affects Residents:**

- Households participating in pilot may have lid lifted on trash and recycling carts as part of inspection and may receive communications related to the pilot.

**How Recommendation affects Haulers:**

- Hauler will need to provide scale tickets monthly for each material type to the County.

**How Recommendation affects the County:**

- County will need to appoint a data coordinator to compile and synthesize pilot data. County will need to arrange for field teams to collect data on a monthly basis. Budget changes may be required if contracted labor is required for set out surveys. The cost of contract labor is included in the budget for the pilot program.

<sup>105</sup> Template for set-out survey can be found in the supporting model on tab, “Set Out Field Survey.”

<sup>106</sup> As an alternative, pilot route collection truck drivers can let scale houses at processing and disposal facilities know that they are delivering material collected from pilot households and the processing and disposal facilities can report pilot tonnage data daily to the County. Recycling pilot trucks will need to make two passes thru the scales to get weights for each broad material category.

## APPENDIX A: REFERENCES

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## APPENDIX B: TONNAGE CALCULATIONS

Tonnage calculation walkthrough. This appendix offers a brief explanation and walkthrough of how the estimated diverted tons from a SAYT program for Montgomery County, MD, were calculated in the spreadsheet titled “TonnageCalculationWalkThrough\_12212022,” provided to Marilu Enciso on 12/21/2022.

### Step 1: Current Collection Tonnages

Tonnage information for the different streams was provided in the data request form Montgomery County<sup>107</sup>. Information was provided for 2017-2021. After discussion with County staff, Marilu Enciso, the data from 2020 due to the anomaly numbers of tons generated during the COVID-19 Pandemic by single-family homes shifting from the non-residential sector. The remaining four years were averaged to provide current tonnage estimates for Commingled Materials, Mixed Paper / OCC, Refuse, Scrap Metal, and Yard Trim. The results are in the figure below.

**Figure B.1: Yearly and Average Tons for each Stream in Subdistricts A and B.**

	2017	2018	2019	2020	2021	Total	Average of 2017, 2018, 2019, & 2021
<b>Sub-District A</b>	<b>125,102</b>	<b>120,782</b>	<b>122,603</b>	<b>139,399</b>	<b>129,021</b>	<b>636,907</b>	<b>124,377</b>
Commingled Materials	10,304	9,926	10,586	13,290	11,582	55,688	10,600
Mixed Paper, OCC	19,636	19,161	17,908	18,680	16,769	92,154	18,368
Refuse	74,751	68,276	76,016	84,737	80,917	384,697	74,990
Scrap Metal	534	462	816	1,057	995	3,864	702
Yard Trim	19,878	22,956	17,277	21,636	18,757	100,504	19,717
<b>Sub-District B</b>	<b>167,694</b>	<b>171,061</b>	<b>164,525</b>	<b>185,615</b>	<b>178,308</b>	<b>867,202</b>	<b>170,397</b>
Commingled Materials	12,684	12,682	12,914	15,344	13,457	67,081	12,934
Mixed Paper, OCC	23,526	22,646	20,313	21,756	19,481	107,724	21,492
Refuse	115,965	119,001	115,537	130,163	129,640	610,305	120,036
Scrap Metal	542	456	516	616	467	2,596	495
Yard Trim	14,977	16,277	15,245	17,736	15,262	79,496	15,440
<b>Grand Total</b>	<b>292,796</b>	<b>291,843</b>	<b>287,128</b>	<b>325,013</b>	<b>307,329</b>	<b>1,504,109</b>	<b>294,774</b>

Figure Notes: Average of 2017, 2018, 2019, and 2021. Excludes 2020. Source: Data request: Item 2.b – Tonnages of trash, recycling, yard trim provided by Montgomery County, MD.

### Step 2: Current Waste Composition

From the Single Family, 4-Season, Residential Waste Composition<sup>108</sup>, recoverable materials were identified for Subdistrict A and Subdistrict B and are provided in the figure below.

**Figure B.2: Percent of remaining materials in Single Family Refuse from Waste Composition Study (2021)**

<sup>107</sup>Data request: Item 2.b – Tonnages of trash, recycling, organics provided by Montgomery County, MD

<sup>108</sup>Waste Composition Study, 2021



Available in Trash	SD-A	SD-B	Materials
Recyclable Paper	11.29%	12.01%	Newspaper/Magazines/Catalogs/Books, Corrugated Cardboard, Paperboard, Office Paper, Carryout Paper Bags, Other Recyclable Mixed Paper
Recyclable Plastic	2.60%	2.86%	PET (#1) Bottle Bill Bottles, Other PET (#1) Bottles, #1 PET Thermoforms, HDPE (#2) Narrow Neck Bottles-Natural, HDPE (#2) Narrow Neck Bottles-Colored, #3-#7 Bottles
Plastic Harder	5.80%	5.27%	Plastic Flower Pots, Other Plastic Containers/Tubs, Other Rigid Plastic
Plastic Film	7.99%	7.71%	Film Plastic - Shopping Bags, Film Plastic - Other
Yard Trim	6.53%	5.42%	Grass/Leaves, Brush/Painting
Food Vegetative	19.31%	19.16%	Food Waste - Vegetative
Food other	0.00%	0.00%	Food Waste - Non-Vegetative
Textile	7.61%	7.48%	Clothing/Linens/Textiles/Leather, Carpets/Rugs/Carpet Padding
Cans Aluminum & Metal	0.81%	0.97%	Ferrous/Bi-metal Cans, Aluminum Cans
Foil	0.50%	0.45%	Aluminum Pans/Foil
Other Ferrous & Nonferrous	1.73%	1.49%	Other Ferrous, Other Non-Ferrous
Glass	1.95%	2.43%	Clear, Brown, Green
Aseptic	0.59%	0.65%	Aseptic/Coated Paper Containers

Figure Notes: Source – Single Family, Subdistricts A & B, 4-Season, Residential Waste Composition Study, from Waste Composition Study 2021.

### Step 3: Availability of Materials to Divert (Tons)

The percent of each stream remaining in the refuse (from Step 2) was multiplied by the available tons of refuse calculated in Step 1. This results in the total available divertible tons of each stream remaining in the refuse (Figure B.3)

Figure B.3: Percent and Number of Tons Available to Divert from Refuse.

Availability in Trash	Available to Divert (Tons)					
	SD-A	SD-B		SD-A	SD-B	SD- A&B
Commingled Materials	5.37%	6.26%		4,025	7,514	11,539
Mixed Paper, OCC	11.29%	12.01%		8,466	14,417	22,883
Yard Trim	6.53%	5.42%		4,895	6,504	11,399
Food	19.31%	19.16%		14,483	23,000	37,483
Scrap Metal	1.73%	1.49%		1,301	1,794	3,094

### Step 4: SAYT Diversion

Figure B.4 shows the Status Quo and SAYT Diversion for Subdistrict A & B in relation to manual cart systems, manual bag-in-can systems, and automated cart systems.

The status quo in Tonnage Flows was obtained from Step 1 (Figure B.1), which represents the baseline for our analysis. To calculate the potential impact of SAYT systems, we used the Diversion (%) from SAYT

published by Skumatz (2015)<sup>109</sup>. This percentage was multiplied by the Status Quo Tonnage Flows, resulting in the New Diversion (Tons). Finally, this new figure was added to the Status Quo Tonnage Flows, resulting in the Tonnage Flows for the three possible SAYT systems. This approach allows us to estimate the potential increase in waste diversion and tonnage flows that can be achieved through the implementation of SAYT systems.

**Figure B.4: Current Generation, Diversion from SAYT Programs, and New Diversion**

TONNAGE FLOWS	SD-A&B Status Quo	SD-A&B Carts	SD-A&B Bags in Cans	SD-A&B Automated Carts
Total Generation	295,622	295,622	295,622	295,622
Trash collected	195,026	165,712	162,781	165,712
Commingled Materials	23,534	28,402	28,889	28,402
Mixed Paper, OCC	39,860	50,436	51,493	50,436
Yard Trim	35,157	35,774	35,835	35,774
Food	848	848	848	848
Scrap Metal	1,197	1,916	1,988	1,916
Bulky items	0	0	0	0
Ash	53,987	45,872	45,061	45,872
Source Reduction	0	12,534	13,788	12,534
DIVERSION (%) FROM SAYT	SD-A&B Status Quo	SD-A&B Carts	SD-A&B Bags in Cans	SD-A&B Automated Carts
Commingled Materials	8%	1.6%	1.8%	1.6%
Mixed Paper, OCC	13%	3.6%	3.9%	3.6%
Yard Trim	12%	0.2%	0.2%	0.2%
Food	0%	0.0%	0.0%	0.0%
Scrap Metal	0%	0.2%	0.3%	0.2%
Bulky items	0%	0.0%	0.0%	0.0%
Source Reduction	0%	4.2%	4.7%	4.2%
NEW DIVERSION (TONS)	Existing	New from SAYT	New from SAYT	New from SAYT
Commingled Materials	23,534	4,868	5,355	4,868
Mixed Paper, OCC	39,860	10,576	11,633	10,576
Yard Trim	35,157	616	678	616
Food	848	0	0	0
Scrap Metal	1,197	719	791	719
Bulky items	0	0	0	0
Ash	53,987	(8,207)	(9,028)	(8,207)
Source Reduction	0	12,534	13,788	12,534
New Trash	195,026	(29,314)	(32,245)	(29,314)
Generation incl. Source Red'n (collection)	295,622	295,622	295,622	295,622

## Step 5: Captured Tons

From the first two steps, generated tons of each stream are calculated from the current captured tons and the tons remaining in the refuse stream. To calculate the current capture rate, the current captured tons were divided by the generated tons. The third step revealed an opportunity to capture additional tons, referred to as opportunity tons. To take advantage of this opportunity, the fourth step calculated

<sup>109</sup> Skumatz, et al., "PAYT: 2014 Update", Econservation Institute prepared for EPA Region 9, 2015.

the incremental tons that could be captured under a SAYT system. The new total tons were then calculated by adding the current captured tons and the incremental tons. Finally, the new capture rate was determined by dividing the new total tons by the generated tons. Figure B.5 shows the current and possible new capture tons and capture rate for a SAYT bag in can system for Subdistricts A & B. Note that the new captured tons do not exceed the generated tons.

**Figure B.5: Current and Possible New Capture Rate from Implementation of SAYT Bag in Can System.**

Tons Remaining	SD-A						
	Generated (tons)	Current Captured (tons)	Current Capture Rate %	Opportunity (tons)	Incremental from	New Total Tons	New Capture Rate %
Trash collected	74,990	74,990		56,303	(13,478)	61,512	
Commingled Materials	14,624	10,600	72%	4,025	1,747	12,347	84%
Mixed Paper, OCC	26,834	18,368	68%	8,466	4,980	23,348	87%
Yard Trim	24,612	19,717	80%	4,895	524	20,241	82%
Food				-	-	-	
Scrap Metal	2,003	702	35%	1,301	612	1,313	66%
Bulky items				-	-	-	
Ash				-	(4,080)	(4,080)	
SR				-	5,616	5,616	
Tons Remaining	SD-B						
	Generated (tons)	Current Captured (tons)	Current Capture Rate %	Opportunity (tons)	Incremental from	New Total Tons	New Capture Rate %
Trash collected	120,036	120,036		89,808	(15,835)	104,201	
Commingled Materials	21,929	12,934	59%	7,514	3,121	16,055	73%
Mixed Paper, OCC	37,112	21,492	58%	14,417	5,596	27,088	73%
Yard Trim	20,244	15,440	76%	6,504	92	15,532	77%
Food				-	-	-	
Scrap Metal	2,126	495	23%	1,794	108	603	28%
Bulky items				-	-	-	
Ash				-	(4,128)	(4,128)	
SR				-	6,918	6,918	
Tons Remaining	Countywide (A&B)						
	Generated (tons)	Current Captured (tons)	Current Capture Rate %	Opportunity (tons)	Incremental from	New Total Tons	New Capture Rate %
Trash collected	195,026	195,026		146,111	(29,314)	165,712	
Commingled Materials	36,553	23,534	64%	11,539	4,868	28,402	78%
Mixed Paper, OCC	63,946	39,860	62%	22,883	10,576	50,436	79%
Yard Trim	44,856	35,157	78%	11,399	616	35,774	80%
Food	-	-		-	-	-	
Scrap Metal	4,129	1,197	29%	3,094	719	1,916	46%
Bulky items	-	-		-	-	-	
Ash	-	-		-	(8,207)	(8,207)	
SR	-	-		-	12,534	12,534	

Table Note: Less Aggressive Scenario can be found in the model on tab "Results – Captured Tons."

## APPENDIX C: SET-OUT FIELD SURVEY

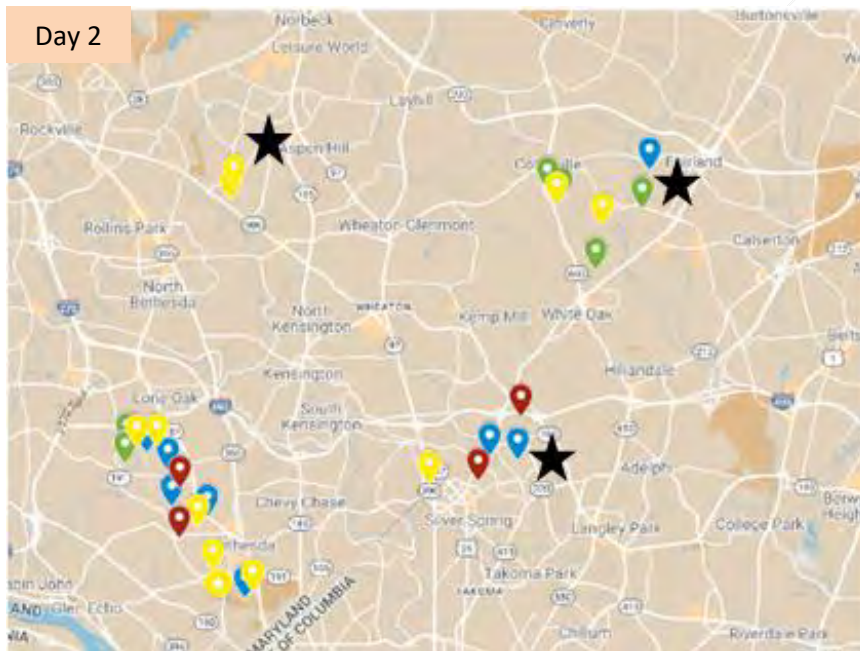
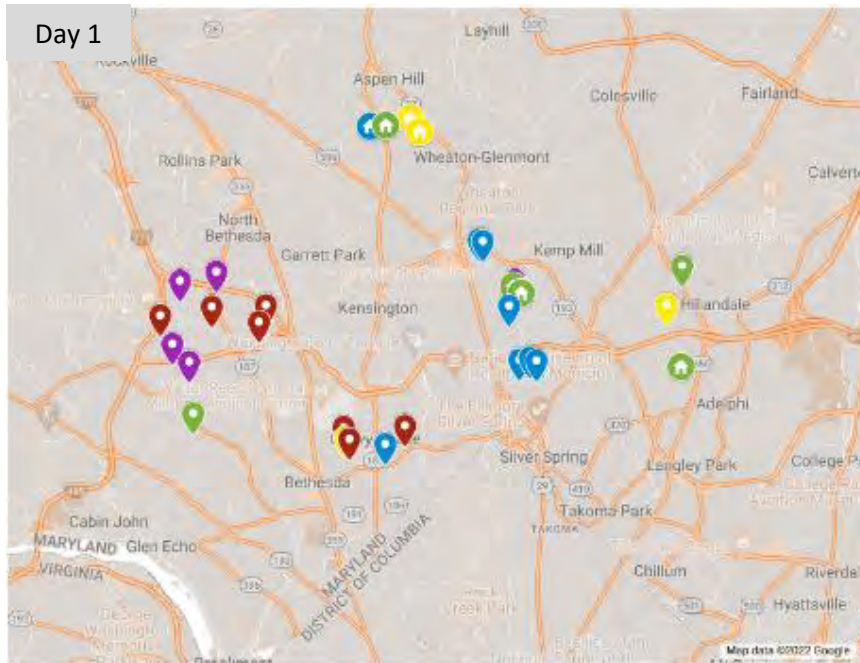
The Set-out Field Survey was conducted by consultant staff. Staff weighed and inspected how full trash, recycling, yard trim, and food (where applicable) containers were from a statistical sample of households in Subdistrict A. The information was used to identify how much service is currently being used and the range of usage (essential to estimating the distribution of can size or the number of bags are needed for the rate / fee analysis). The usage and space remaining in trash, recycling, and yard trim carts informed how much additional diversion could be managed within the containers available. The weight and space in trash identified compaction potential under a can scenario. The information was input into SERA's models to estimate changes in service needs under SAYT assuming additional diversion to recycling, yard trim, and waste reduction, and how much compaction can occur. This let us identify "revenue units" of trash under the new SAYT system (vital to financial viability estimates), and informed the estimates of changes in trash, recycling, yard trim, and waste reduction tons from the new system (vital to cost analysis and relative benefits). These estimates were tailored for each of the scenarios.

The survey was conducted in Subdistrict A only as Subdistrict B does not have standardized trash collection days and was not time nor cost-effective for conducting a field survey. The survey was conducted over two days, Wednesday, August 31, 2022, and Thursday, September 1, 2022. 60 starter homes (30 for each day) were randomly identified from route information provided by Montgomery County (MOCO), see Figure C.1. Two teams of two people were used each day for the survey. Each team was assigned 15 homes each day based on estimated route pick-up times, equity emphasis areas, and collecting in each of the 5 collection areas to measure a representative sample on Subdistrict A.

Teams arrived at a starter home and identified if any of the streams had been collected. If it was identified that a stream (trash, paper, containers, yard trim, or food) had been collected, the team moved to the next starter home. Once a team arrived a starter home that had not been collected, the teams noted if containers were present or not, how many containers of each stream were set out, the size of each container, how full each container was, and then weighed each container on a large portable postage scale. This was done for the starter home and the following 5 homes adjacent to the start home (for a total of 6 homes per starter home). When these 6 homes were completed, the team moved to the next starter home. Teams remained in communication and moved throughout Subdistrict A as needed based on which routes had or had not been collected. Hugo Morales, Program Specialist II, accompanied the teams on both days of collection and provided invaluable assistance in the collection of data during this survey.

**GOAL:** The goal of the survey was to obtain representative data on the set-out distribution of volumes and weights of all levels, not just the average, in order to make projections about changes due to the SAYT incentives, such as increased diversion.

**Figure C.1: Maps of Starter Homes for Set-Out Survey on Day 1 (Wednesday) and Day 2 (Thursday)**

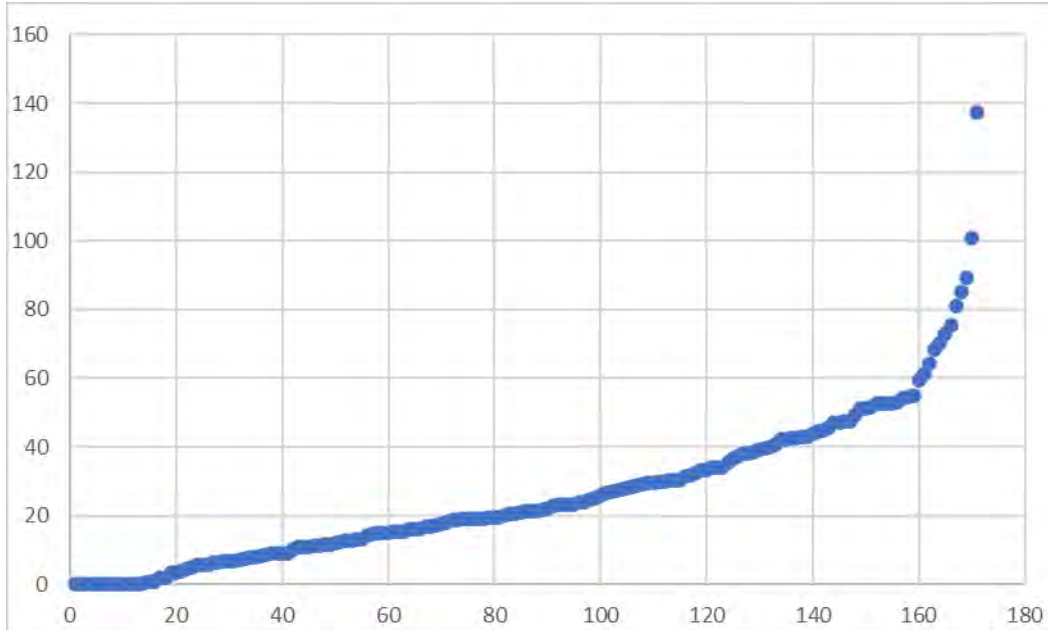


**Figure Notes:** ★ Denotes Equity Area. There are a total of 17 houses from the field survey that are in the equity census tracts. This makes up approximately 10% of the field survey sample (our estimates that single family homes in the EFA represent about 13% of the households in the county). The equity homes were used as part of the overall sample analysis. We did not sample for substrata.

The information collected from the Set-out Field Survey was entered into a spreadsheet in excel. Figure C.2 shows the distribution of trash (in pounds) by households. The average weight of trash set out by

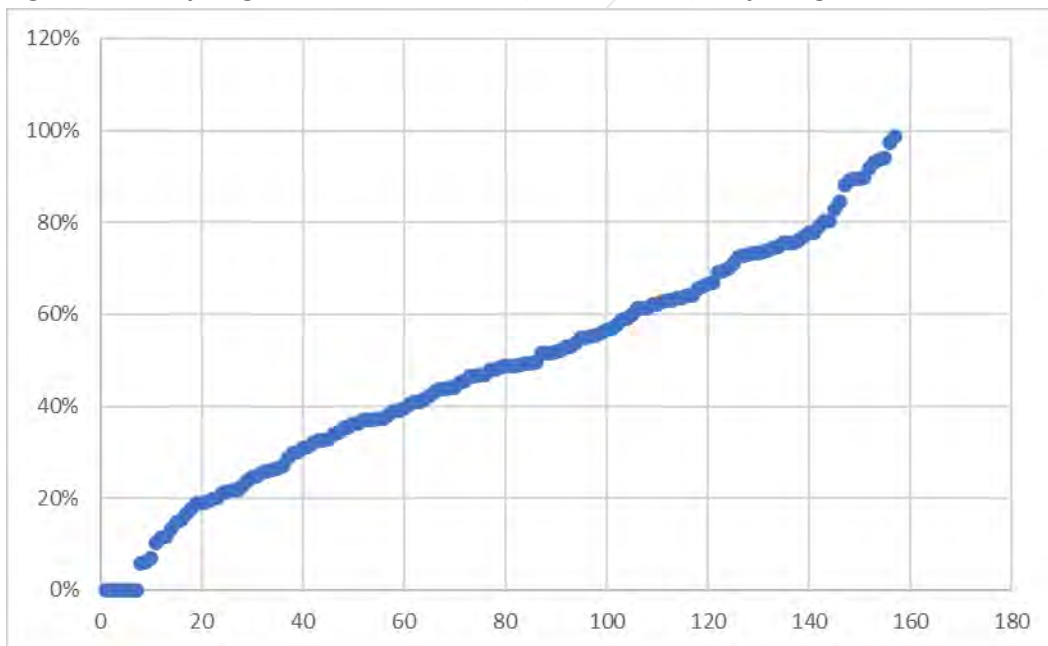
households is approximately 26 lbs. For households with trash set out, the average diversion by weight for recycling and yard trim is 48%, meaning approximately half of currently set out generation, by weight, is being diverted (Figure C.3).

**Figure C.2: Trash Weight Set Out – Distribution**



*Figure Notes: Y-axis: Pounds; X-axis: Count of Homes, Average=26.35 lbs, Median=21.32 lbs*

**Figure C.3: Recycling + Yard Trim Diverted (of Generated) – By Weight**



*Figure Notes: Y-axis: Percent diverted; X-axis: Count of Homes With Trash Out, Median=48.5%, Average=48.0%*



Based on the size and how full each container was, we were able to calculate the amount of trash in gallons (Figure C.4). Comparing the weight of the containers (in pounds) and the number of gallons of space that trash occupied in each can, we calculated the distribution of compaction for each home. Figure C.5 shows this compaction distribution and is used to calculate how much more compaction is possible in a SAYT system (Figure C.6). In first column in Figure C.6 is the current percent of households setting out various amounts of trash in gallons. The second column is the distribution accounting for additional compaction. The third column (Column C) shows calculated new distribution homes producing the different gallon amounts of trash when accounting for additional compaction and additional diversion from SAYT.

**Figure C.4: Trash Gallons Set Out – Distribution**

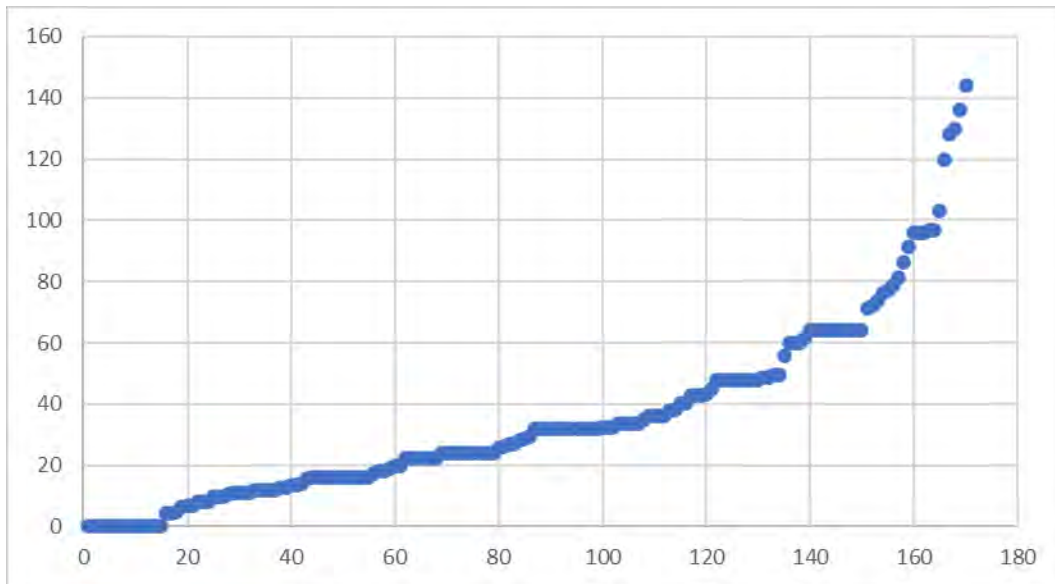


Figure Notes: Y-axis: Gallons; X-axis: Count of Homes, Average=36.6 gal, Median=29.95 gal  
\*(Plus one at 240 gal)

**Figure C.5: Trash Pounds/Gallon – Distribution (compaction)**

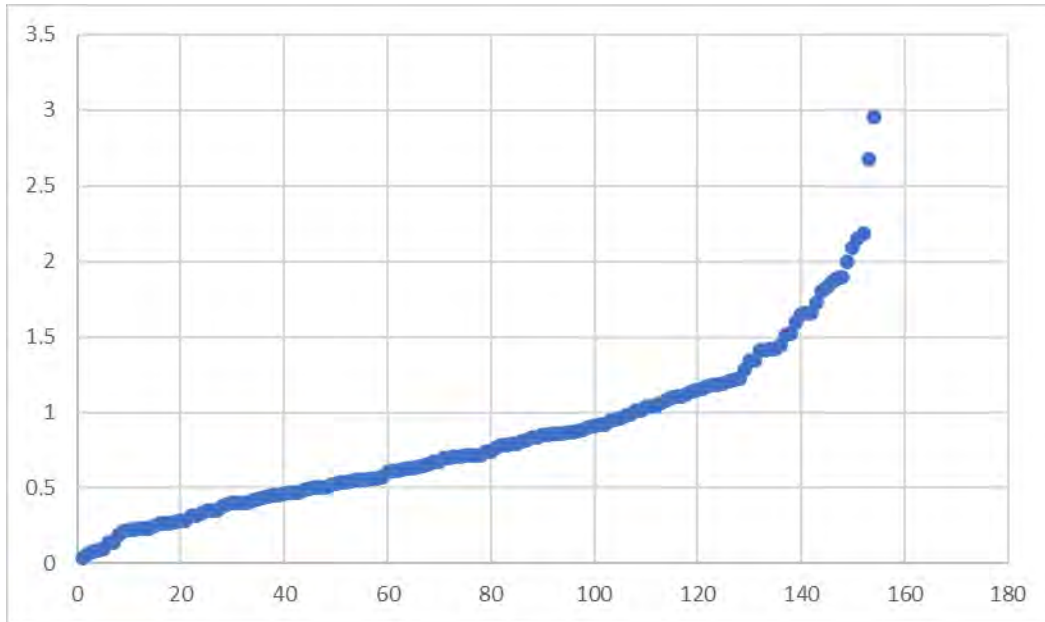


Figure Notes: Y-axis: Pounds to Gallon Ratio; X-axis: Count of Homes With Trash Out, Average=0.89 (0.834), Median= 0.718

\*+one at 9.4

**Figure C.6: Estimated New Subscriptions Based on Gallons**

	A: Base - Current	B: Accounting for Diversion	C: With Diversion AND compaction
0 gal	9%	9%	9%
20 gal	27%	31%	38%
35 gal	22%	26%	21%
48 gal	18%	13%	13%
64 gal	12%	11%	11%
96 gal	7%	7%	5%
>96	5%	4%	3%
Total HH	100%	100%	100%



## APPENDIX D: WEB SURVEY

The web survey was designed by the SERA team to gather information from a statistical sample of customers in Montgomery County, MD. The ideal sample size was between 68 and 97, with a +/- 10% confidence level of 90 or 95%. The survey was conducted on Survey Monkey and utilized a purchased sample from Dynata, stratified by those in Areas A and B. The survey was aimed at collecting information on current waste management behaviors, customer satisfaction, barriers and concerns, support for program changes, likely service needs, willingness to pay, and other relevant information.

To participate in the survey, respondents had to meet certain criteria, including living in Montgomery County, MD, being at least 18 years of age, and living in a single-family home or an apartment with 6 or fewer units. Respondents were required to have knowledge of who they pay for trash collection and the amount of trash generated in their household. The respondents were asked to estimate the amount of trash they set out based on bin size, average weekly fullness, and the frequency of set out. This information was then used to calculate the estimated gallons of trash set out each week. The survey took approximately 11 minutes to complete.

The main question used to assign respondents to Subdistrict A vs. Subdistrict B was a question related to who they paid for trash service. A total of 249 complete responses were collected, with an original goal of 138, with 124 responses from Subdistrict A and 125 from Subdistrict B. This provides a strong basis to look for significant differences between the Subdistricts, and for confidence in the overall results. The survey instrument was reviewed by staff. The responses for Subdistrict A and B separately have similar confidence levels (+/- 9.5% at 95% confidence) and the confidence for the entire sample (A and B combined) is +/-6.5% at 95% confidence level.

The analysis showed no significant difference in the respondent's set out amount between Subdistricts A and B. The survey results were used to refine the design of the SAYT program and address barriers or concerns. This survey also provided a touchstone with resident attitudes and helped Montgomery County make informed decisions about the waste management program.

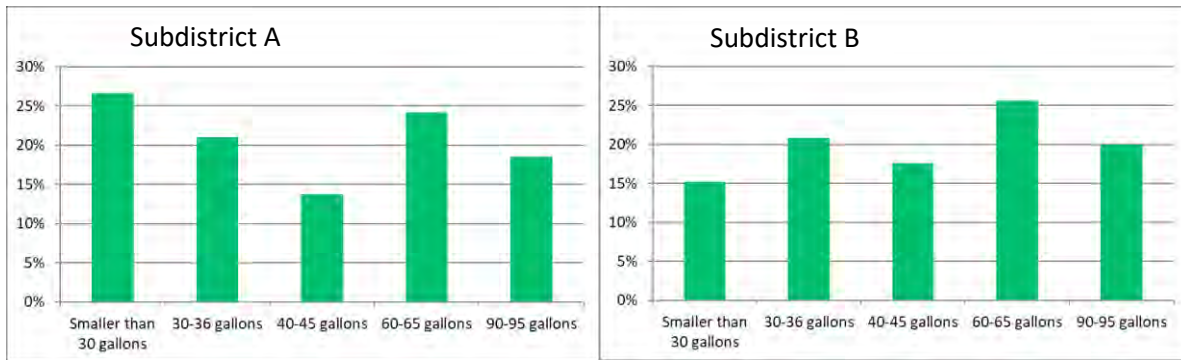
GOAL: How many gallons of trash does each subdistrict set out?

The results of the online survey were used to determine the relationship between the reported gallons of trash generated in Subdistrict A and Subdistrict B. The amount of reported generated trash is represented in the following equation:

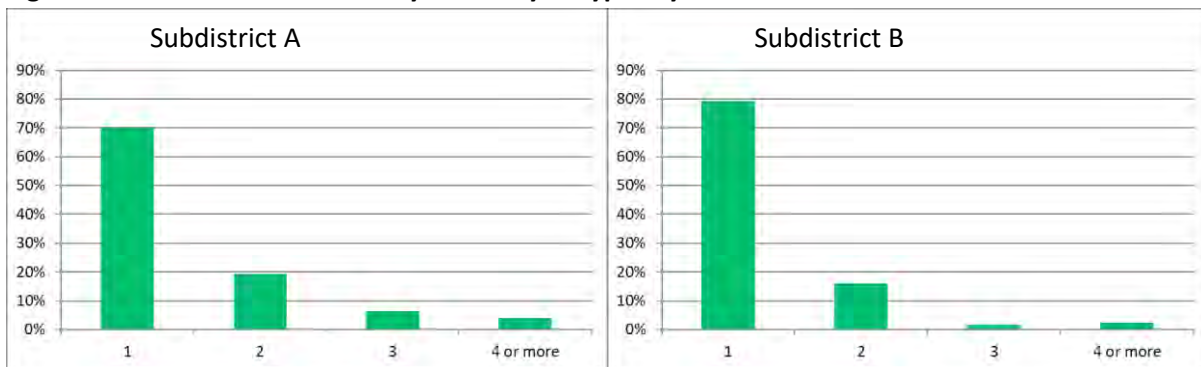
Gallons generated = Can Size \* Number of Cans Set out \* Frequency of Set Out \* Can Fullness

This information is represented in Figures D.1, D.2, D.3, and D.4.

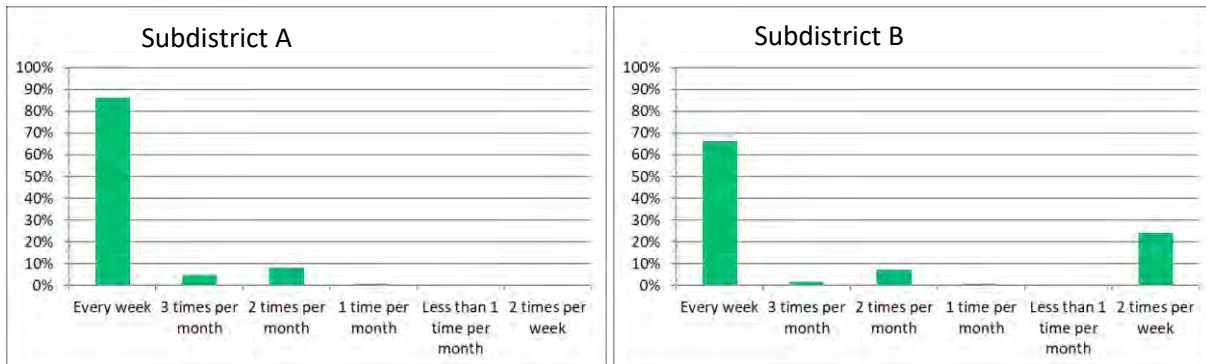
**Figure D.1: Question 6. How large are any cans you typically set out for TRASH or GARBAGE collection?**



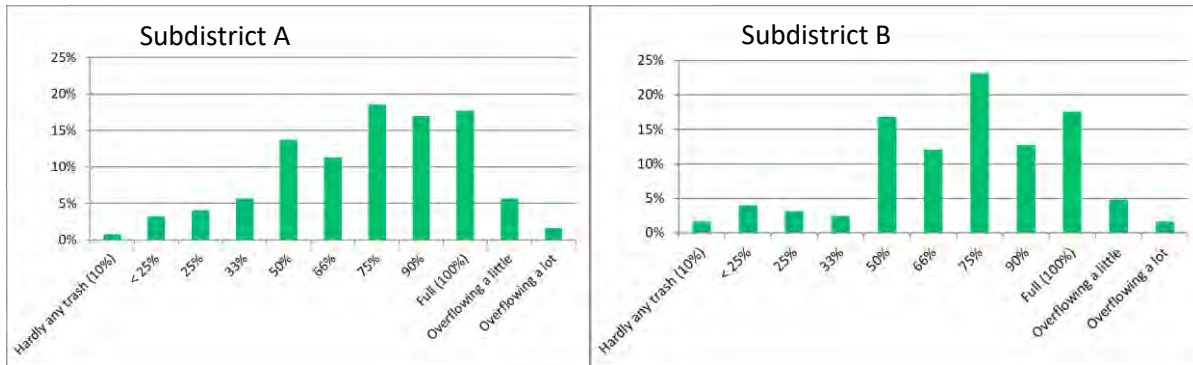
**Figure D.2: Question 7. How many cans do you typically set out for TRASH collection?**



**Figure D.3: Question 8. On Average, How Often Do You Set Out These Cans for TRASH Collection?**



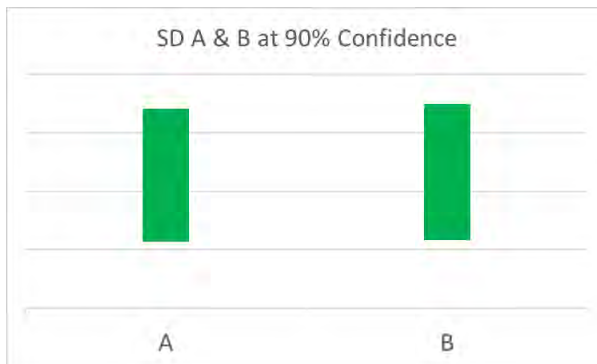
**Figure D.4: Question 9. Typically, Approximately How Full Is/Are The TRASH can(s) When You Set It/Them Out?**



While there may appear to be small reported differences between the groups based on the graphs, analysis determined that the responses to each of these factors were not statistically different between Subdistrict A and Subdistrict B as seen in Figure D.5.

Based on these results, average and distribution data from the Set-out Field Survey in Subdistrict A can be used to make accurate predictions about waste generation in Subdistrict B.

**Figure D.5: Analysis Results – Gallons of Trash From Subdistricts A & B**



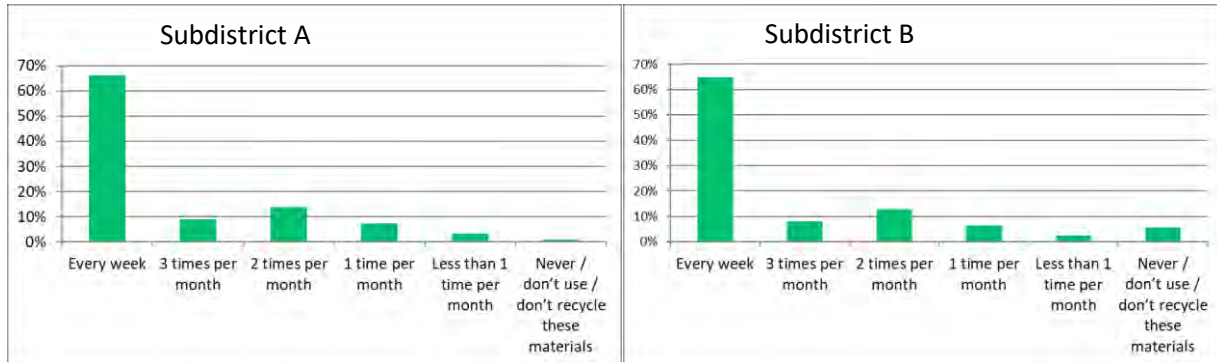
Overall results include:

- Question 9 – Approximately how full is your trash cart when you set it out. The majority of respondents stated their cans are between half full and 100% full (Figure D.4).
- Recycling is being participated in well; 65-70% of the households set out the two streams on a weekly basis. (Question 13)
- Households report recycling the following items regularly (reported in decreasing order): plastic, glass, cans/commingled, cardboard, and mixed paper (Question 17, Figure D.7)
- 80% do not bring recycling elsewhere (beyond curbside), and about 15% use the county facility (Question 18).
- Question 27 showed households still see a lot of recoverable material in their trash (Figure D.9).

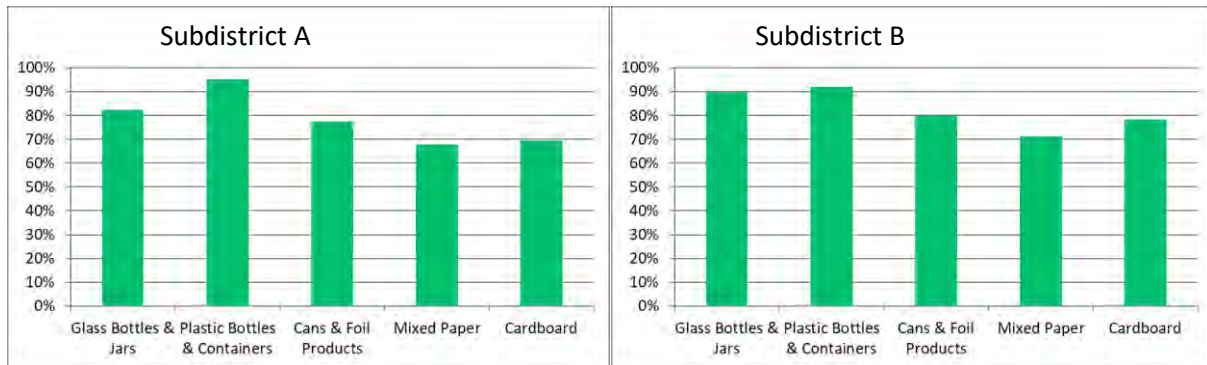
The survey points out some differences between Areas A and B as well.

- Question 30 – Reception to SAYT. Overall, respondents in both subdistricts are interested or likely to change to a smaller trash cart for a reduced price. Subdistrict B did have the most respondents selected “Extremely unlikely,” although it is not known if this is a response to SAYT or to changing haulers to the County (Figure D.10).
- Questions 31 and 32 – Satisfaction with Trash and Recycling service. The majority of respondents in both Subdistricts state they are very satisfied with their services, however, it appears that more respondents are Subdistrict A are satisfied with their service than those in Subdistrict B.

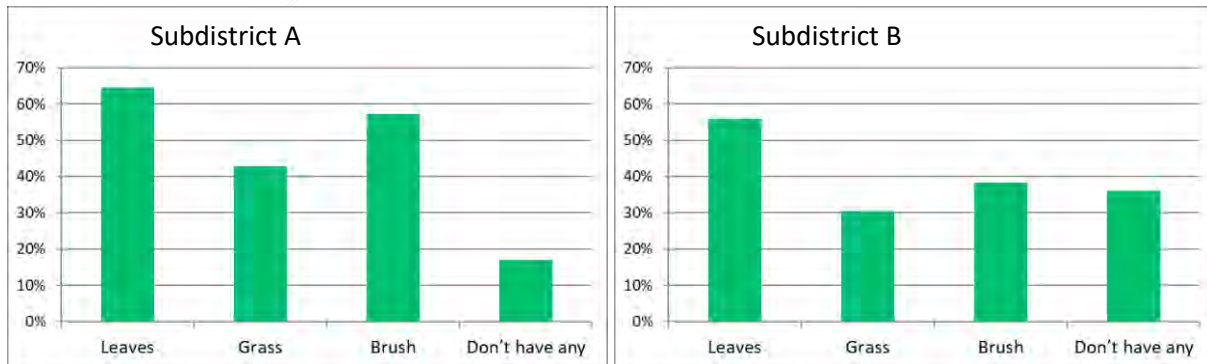
**Figure D.6: Question 15 How Often Do You Set Out Recycling?**



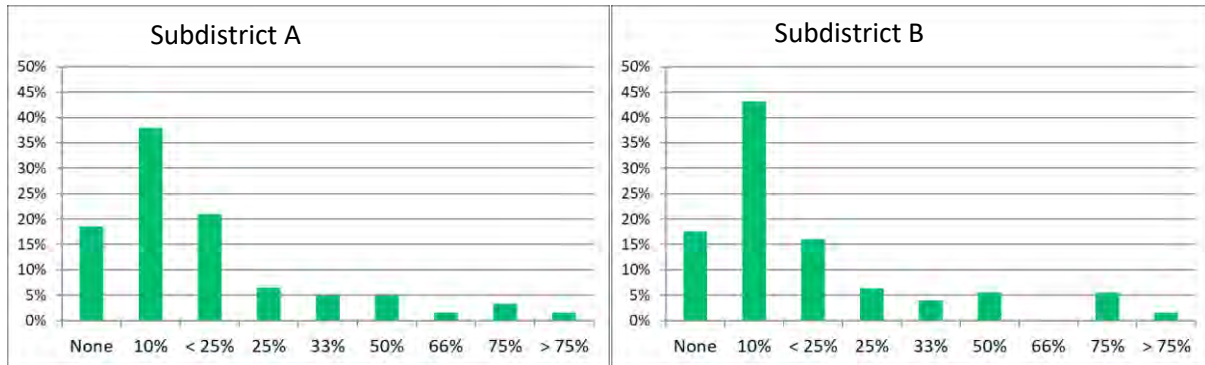
**Figure D.7: Question 17 Which Materials Do You Recycle Regularly?**



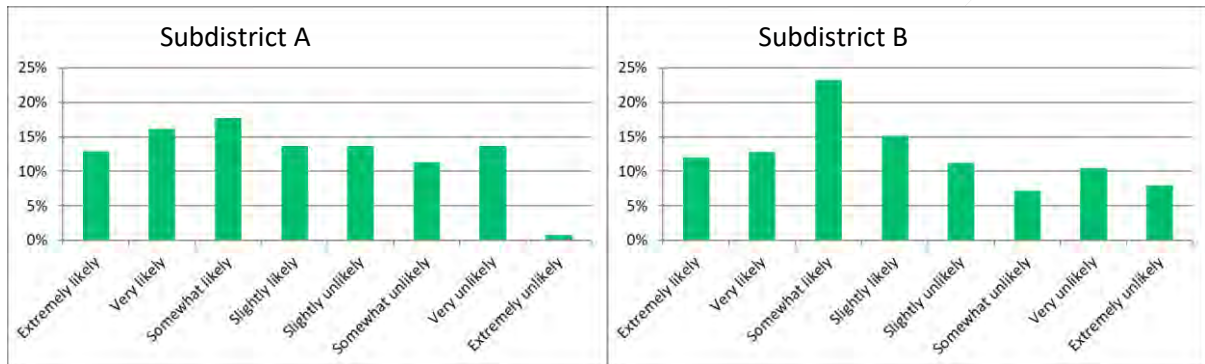
**Figure D.8: Question 23. Which YARD TRIM Materials Do you Commonly Set Out?**



**Figure D.9: Question 27. About how much of all materials thrown away in your TRASH CAN is possibly recyclable?**

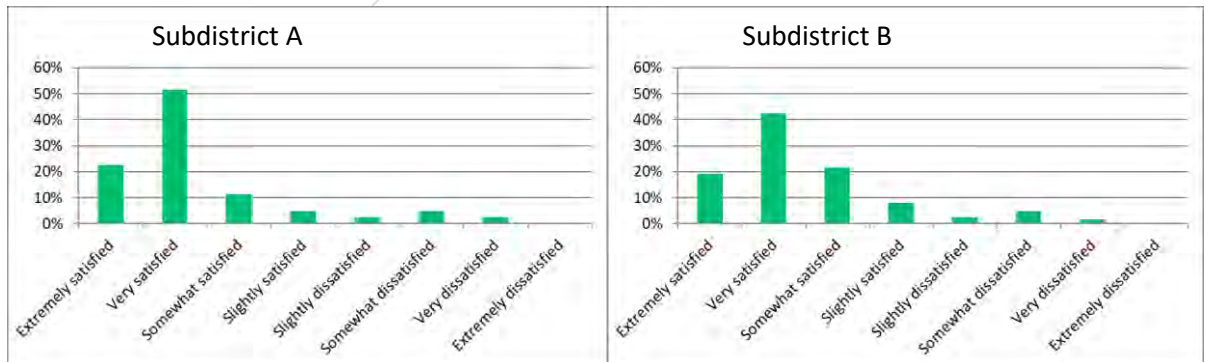


**Figure D.10: Question 30. Reception to SAYT – How Likely Would You Be To Switch To a Lower Trash Service**



*Figure Notes: Subdistrict A Average Score: 0.69; Subdistrict B Average Score: 0.59. These scores were calculated based on a scale of +4 to -4 ranging from Extremely satisfied through Extremely not satisfied. These scores reflect respondent answers and were assigned the score to help visualize the difference between the two subdistricts. Statistical significance was not calculated.*

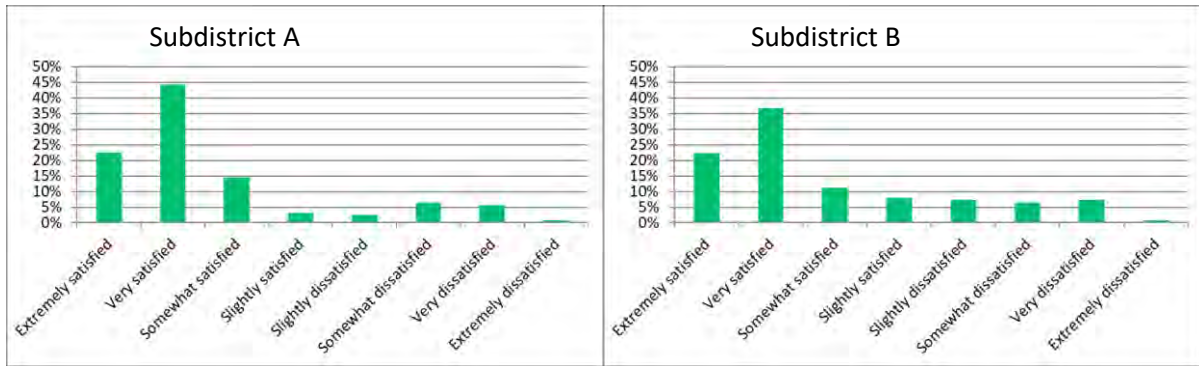
**Figure D.11: Question 31. How Satisfied Are You With Your TRASH Service?**



*Figure Notes: Subdistrict A Average Score: 2.53; Subdistrict B Average Score: 2.38. These scores were calculated based on a scale of +4 to -4 ranging from Extremely satisfied through Extremely not satisfied. These scores reflect respondent answers and were assigned the score to help visualize the difference between the two subdistricts. Statistical significance was not calculated.*



**Figure D.12: Question 32 How Satisfied Are You With Your RECYCLING Service?**



*Figure Notes: Subdistrict A Average Score: 2.20; Subdistrict B Average Score: 1.86. These scores were calculated based on a scale of +4 to -4 ranging from Extremely satisfied through Extremely not satisfied. These scores reflect respondent answers and were assigned the score to help visualize the difference between the two subdistricts. Statistical significance was not calculated.*

Survey instrument and full results for Subdistrict A and B can be found in the Appendix D attachments.

## APPENDIX E: FEASIBILITY ANALYSIS

### E.1 Introduction to the Feasibility Analysis

As requested in Montgomery County's (MOCO) Request for Proposal, this study was conducted as a two-phase project. The first phase of the project focused on conducting a planning-level feasibility study to assess the practicality of the change from Montgomery County's existing Solid Waste Management system to a new Pay-As-You-Throw (PAYT) or Save-As-You-Throw (SAYT) system. In the feasibility phase, the study provided a planning-level assessment of a number of topics, including new systems and incremental changes related to:

- the volume of waste generated, the behavior of waste producers, the usage of the current collection system,
- different collection systems and providers,
- mitigation strategies to address any issues with the new system
- the impacts of potential waste management facilities and options
- the financial aspects of the project.

The outcomes of this phase included a performance scoring of different options based on a set of criteria and the resulting rankings indicated by the scoring of the options.

The second phase of the project built off the results of the feasibility work and included a detailed analysis of the leading option(s) identified in the first phase. This phase involved a deeper dive into the chosen option(s) to better understand the feasibility, costs, and benefits of the proposed solution. In addition, the implementation section, addresses the important concerns related to the limitations from Chapter 48 of the Solid Waste Collection Regulations, a topic not addressed in this appendix. If a feasible, effective SAYT program cannot be developed, there is no need to further investigate options of Chapter 48's limitations and implementation strategies.

In summary, the two-phase project was designed to provide a comprehensive analysis of the existing Solid Waste Management (SAYT) system and identify potential improvements while also ensuring that the solution is feasible, cost-effective, and sustainable in the long-term, taking into account factors such as cost, feasibility, sustainability, and community impact.

As background, this project had numerous moving parts, so it is not strictly possible to conduct each step in turn without considering pieces that were being analyzed related to another topic. For this reason, there are places in the text that, when discussing one topic, refer to later analyses that support a special sub-component of the topic being addressed. The work is interrelated, not strictly independent, step by step. The report is organized to minimize this, but strict independence was not possible.

This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.

## E.2 Authorities and Service Providers in Subdistrict A vs. Subdistrict B

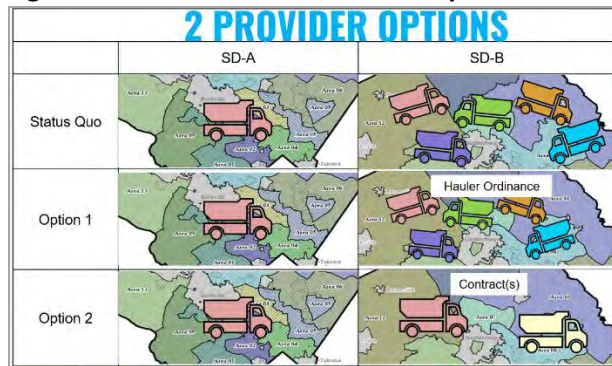
A successful SAYT program will require success in both areas SD-A and SD-B. Of particular importance was the consideration of the very different existing trash collection arrangements in Subdistrict A (collected via multiple county-contracted trash haulers) and Subdistrict B (trash collected via multiple haulers operating independently / competitively). The existing system is more uniform for the collection of recycling; the County provides this collection via multiple county-contracted trash haulers across the entire county (SD-A and SD-B).

The project assessed options for how the SAYT program could be delivered and managed in SD-A and SD-B. Given the existing authorities and operation, SD-A's arrangement made the most sense as a continuation of the existing program – County-run through a contractor arrangement. However, managing a new system with multiple independent, disconnected haulers in SD-B is more complicated. Based on a review of successful models used nationally, two overarching options are most feasible:

- requiring SAYT structures by all haulers operating within the SD-B area (an “ordinance” option), or
- issuing a Request for Proposals (RFP) for one or more haulers to provide trash service under contract to the County. One contractor may be issued (contract), or multiple contracts (districted).<sup>110</sup>

The pros and cons of these options are discussed below.

**Figure E.1: Illustration of Provider Options in SD-A and SD-B**



### Hauler Ordinance Option

Ordinances requiring SAYT serve as a strong driver for diversion and provide a fair amount of control (the necessary elements) without “interfering” in hauler business as much as the contracting option does. The method of implementing this option is to pass an ordinance that requires all haulers wishing

<sup>110</sup> Franchising was also considered, but the County's existing contracting arrangements, and the unusual billing system used in the County led to a preference for a stronger contract-based arrangement.



to operate in the area (SD-B, here) to conform to specific conditions to be granted that right to operate.<sup>111</sup> These conditions, modified to the MOCO situation, follow.

- **Various Safety Issues:** Requirements for truck and operator safety issues, avoiding leakage, etc. (usually addressed at the local ordinance or licensing level)
- **Fees and PAYT:** The cost for trash service must be in a PAYT structure<sup>112</sup>. The PAYT system must:
  1. Offer, as its smallest container, a container no larger than X gallons, and must offer service in Y gallon increments above this service. These service levels are specified by the County. For reasons discussed later, the service levels carried forward for this project are 32 gallons as the smallest container, and 32-gallon increments thereafter, up to 96-gallon containers.
  2. The cost of the trash container service must be set so that, throughout the service levels available, the percentage rate differentials between trash container sizes must conform to MOCO's requirements (in percentage, not dollar rate, levels). These levels will be discussed later in the report. Note that ordinances cannot dictate rates; however, examples around the nation have successfully required percentage rate differentials without difficulty.
  3. The county should establish auditing rights to provide itself the opportunity to assure the haulers are promoting the smaller-than-maximum container size options, as well as other auditing functions that may be desired by the authorities.
- **Reporting and Audit Authority:** The County should require haulers to report the trash collected within the county's boundaries, with reporting at least quarterly. This will allow the County to monitor progress in diversion. Establishing the authority to audit compliance with the ordinance is also important.
- **Educational responsibilities:** The legislation should designate minimum requirements for the frequency of recycling education and how much outreach the County or the hauler (or both) should be required to provide (e.g., requiring haulers to provide annual outreach or mailers to customers).<sup>113</sup>

The advantages of a Local SAYT Ordinance (in SD-B) follow.

- **Hauler Advantages:** The system doesn't not restrict the number of haulers operating in the area, helping existing haulers protect their businesses more than a contracting option does. The system covers all haulers, establishing a new level playing field for haulers. Haulers prefer this option to the risk of losing the right to serve in an existing territory, which can come from the introduction of a competitive contracting arrangement.

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<sup>111</sup> Specific recycling requirements are a usual part of these PAYT ordinances, but MOCO already provides this service across both SD-A and SD-B. There is no overarching reason to change this system with the introduction of SAYT.

<sup>112</sup> This SAYT structure usually requires incorporation of the full costs of the recycling service as well. MOCO is an exception, as this cost is provided by and funded by MOCO, so these provisions are omitted.

<sup>113</sup> Often the best programs have both the hauler and the County providing education to households. This establishes the portion for which the hauler is responsible. This can augment county outreach efforts and provide a coordinated message.

- **SAYT program benefits:** The new system provides ranges of levels of service for residents, with rates that are considered incentivization and more equitable for small / large disposers;
- **SAYT recycling incentive:** Better participation and diversion from recycling and other programs due to the price incentive introduced;
- **Public Benefits:** Potentially, safety, health, and other benefits are realized. This can introduce additional conditions that MOCO may want in order to better protect the public.

### Contracting to Achieve PAYT

A somewhat more complex – but also beneficial – option to achieve PAYT is to undertake an initiative to district or franchise trash collection or alternatively to contract for trash service with one or more haulers, depending on the size of the County.

For Montgomery County, it will likely be very beneficial to split the service territory into at least two areas and have haulers propose. Two areas are suggested in order to maintain competition or to have a fallback option in case one hauler underperforms. However, for MOCO, we suggest that with two areas, these areas be uneven sizes. Pencils are sharpened, and the bidders can no longer count on getting half the service territory if you award the larger share of the County to the lower bidder. Otherwise, a hauler confident of finishing in the top two will not have the incentive to reduce prices. This has proved very successful in communities across the country.

**Contracting has a barrier:** An RFP process is more complex to implement than an ordinance-based process, requiring a more involved set of specific steps than an ordinance. However, the main complexity is not the requirements of advanced publication / notification, RFP development, scoring, negotiation, or other steps in the process. Rather, the greater complexity or barrier comes from the fact that the political issues are more prickly. The new system may lead to some local haulers being “winners” and others, “losers”, and the losers will not usually stay quiet during the process of considering this option, because there is a risk their livelihood and business<sup>114</sup> will be affected.

This perceived (and real) hauler business risk can be mitigated by establishing multiple districts and offering multiple contracts, improving the odds for any existing hauler. If a major concern is the preservation of small haulers (a common concern in times of consolidation), smaller districts can be established, and restrictions or RFP conditions put on the competition for that area. The total number of districts that are advantageous to MOCO can be determined based on the number of households. Too many districts are not efficient; too few lead to other issues. Phase 2 of the project conducts this calculation.

However, in general, in an area like MOCO’s SD-B, with multiple competitive haulers providing service, a contracting option with multiple districts (but fewer districts than the current number of haulers) can lead to:

- **Efficiencies:** lower rates because of economies of scale and collection from all households in an area;

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<sup>114</sup> and consequently, retirement funded by sale of the business.

- **Fewer Trucks:** lower wear and tear on streets from fewer trash trucks supplying the same neighborhoods and lower greenhouse gas emissions, and
- **Customer effects:** “neater” streets, with trash containers out on one day instead of multiple collection days,
- **Control:** greater control and uniformity in the collection, messaging, and other benefits.

A new contract can lead to benefits for the County; however, it requires strong political will to pass the program. Many communities that have taken this approach have heard complaints from residents that they do not like having their choice among haulers taken away – that they like their haulers. In addition, haulers will tend to prefer the “status quo.” They fear possibly losing some of their customers – or all their customers if they are an unsuccessful bidder. They will likely oppose the new contracting option. To implement a contract requires a number of steps (detailed in Appendix E: Feasibility Analysis).

**Figure E.2: Advantages and Disadvantages of Collection Service Provider Arrangements in SD-A and SD-B**

Option	Pros	Cons	Other
Across All	<ul style="list-style-type: none"> <li>• Increased Diversion</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in routing &amp; labor to arrange for one trip to facility per day per truck</li> </ul>	
SD A: Continue	<ul style="list-style-type: none"> <li>• Minimal disruption in delivery and contracts</li> </ul>	<ul style="list-style-type: none"> <li>• Changes in routing for all services</li> </ul>	
SD B – Continue	<ul style="list-style-type: none"> <li>• Minimal disruption in delivery for county</li> </ul>	<ul style="list-style-type: none"> <li>• County recyclables routing / staff</li> <li>• Disruption in trash service for SD B haulers</li> <li>• Trash service compliance</li> </ul>	
SD B – Hauler SAYT Ordinance	<ul style="list-style-type: none"> <li>• Minimal disruption for county;</li> <li>• More control, including rate differentials, service</li> <li>• Small effort for ordinance; some fight</li> <li>• Fewer SD B-hauler complaints than contracts</li> <li>• Enforcement for SD B compliance</li> </ul>	<ul style="list-style-type: none"> <li>• Same as above, with better hammer for compliance</li> <li>• Staff for compliance</li> <li>• SD B-hauler complaints</li> <li>• Draft/pass ordinance with key elements</li> </ul>	<ul style="list-style-type: none"> <li>• Control, fewest complaints, common; ordinance</li> </ul>
SD B – Hauler Franchise / multiple contracts	<ul style="list-style-type: none"> <li>• Similar to above plus more authority, uniform</li> <li>• Fewer SD B-hauler complaints than one contract</li> <li>• Can do uniform rate designs</li> </ul>	<ul style="list-style-type: none"> <li>• Similar to above plus: County RFP effort and contract management</li> <li>• SD B-hauler complaints; may oppose</li> </ul>	<ul style="list-style-type: none"> <li>• Greater authority, common</li> </ul>

Option	Pros	Cons	Other
SD B – Single contract / take over	<ul style="list-style-type: none"> <li>Control &amp; authority</li> <li>Uniform rates and service; quality control</li> </ul>	<ul style="list-style-type: none"> <li>SD B-hauler complaints; haulers will launch a campaign against the initiative, hurting UBP / SAYT passage</li> <li>Staffing for RFP, contract management</li> </ul>	<ul style="list-style-type: none"> <li>Common</li> </ul>

**Policy / System Design Results Discussion and Rationale – Service Provider Arrangement**

The consultants discussed these two options with the County. Many communities select ordinance options because of the political pressure exerted by haulers. The County is willing to bear that burden in order to provide greater collection efficiencies, less wear-and-tear on streets, and greater uniformity that can be achieved. One of the most important reasons for the greater feasibility of the contracting / distribution option for MOCO is that the County’s feasible billing options are limited. The County relies on a fee-based system administered through property taxes. Extending this option to multiple private haulers operating under only an ordinance, would be much more complex than basing fees and billing on costs associated with direct contracted haulers.

**Figure E.3: Key Advantages of Ordinance vs. Contracting for MOCO SD-B**

Advantages of Ordinance	Advantages of Contracting
<ul style="list-style-type: none"> <li>Likely fewer haulers, increasing collection efficiencies for customers and decreasing trucks on the street</li> <li>More competition in the area</li> <li>Fewer complaints from haulers related to “taking away” their business</li> </ul>	<ul style="list-style-type: none"> <li>Fewer haulers, increasing collection efficiencies for customers</li> <li>More organized and uniform collection service in the area</li> <li>More administrative control</li> <li>More feasible for billing options for the County</li> </ul>

**Policy / System-Design Results – Feasibility-Level:** Implement service in SD-B by identifying multiple districts within the service area, and issue a competitive RFP process, and enter into multiple contracts for trash collection service in SD-B. Maintain the Status Quo single-hauler contractor system in SD-A.

**E.3 Estimating Tonnage and Subscription Options from SAYT**

The price incentive aspects of the SAYT system will lead to behavior change, increasing recycling and reduction, and decreasing trash tonnage. This is the goal of the SAYT system. A key step driving all the other changes in the feasibility study is an assessment of the changes in tonnage and the resulting customer service levels (or subscriptions to container sizes) driven by the price incentive and behavior changes. The results of the tonnage analysis have impacts on the costs, facilities, and other aspects of the waste management system. Increasing significant amounts of waste to recycling will increase the cost of managing this stream, while the costs of managing the waste stream may decrease.

Higher rates for removal of more trash (and the resulting financial reward from using less service) is the core incentive associated with SAYT.

The analysis of subscriptions will result in revised revenue units and will have impacts on the rates, rate design, and cart purchases associated with the waste management system.

- The new tonnage estimates for the SAYT system were developed using a variety of sources, including data from Montgomery County Tonnage records, a survey, a set-out survey, statistical studies, data on communities, and modeling. The goal of this analysis was to develop an estimate of the amount of waste disposed and diverted, which will take into account waste reduction efforts. The information will then be transferred to the "facilities analysis" portion of the project. This analysis will help to determine if any changes are needed to the existing facilities or if new facilities need to be built to accommodate the estimated waste processing needs.
- The study also estimated the new subscription levels under the new trash collection system. The goal of the new subscription level estimation is to determine the likely usage of different can sizes under the new trash collection system, taking into account the expected increase in tonnage diverted to recycling and waste reduction, as well as the potential impact of compaction. These results feed directly into the rate computation, among other uses.

#### Steps Used in Estimating Tonnage and SAYT Subscription Levels for MOCO

- Tonnage: - Start with data on total trash tonnages, by stream, from the County
  - Review available statistical studies and information on tonnage impacts of SAYT's effects in incentivizing increases in recycling, composting, and waste reduction
  - Closely review the materials still available to divert – by category - from MOCO's trash waste composition
  - Estimate diversion to 3 streams (recycling, compost, reduction)
  - Revise based on an assumption of slightly greater reduction effects from bag programs
  - Use the results to drive the study's work on impacts on costs, facility operations, etc.
- Subscriptions: Start with distribution of trash volumes from set out survey
  - Apply diversion (above) to recycling, based on incentive, and recoverable material remaining
  - Add stumping impact
  - Results in revised revenue units
  - Subscriptions have impacts on rates, rate design, cart purchases, etc.

## Estimating Tonnage Impacts

The feasibility analysis started by analyzing the tonnage impacts. The study reviewed the literature on statistical information on the impact of SAYT's incentivizing programs (such as recycling, composting, and waste reduction) on the tonnage of waste generated. These studies<sup>115</sup> indicated that in general, SAYT leads to a reduction of 17-18 percentage points of generated tonnage from the landfill destination, and allocates it to three new destinations. About 6 percentage points now represent an increase in the amount of recycling, another 5-6 percentage points move to increased diversion of yard trim, and another 6 percentage points are removed from collection entirely as new source reduction – almost

<sup>115</sup>Econservation, 2015

exactly one-third, one-third, and one-third to the three diversion destinations. The source reduction reflects changes in behavior toward buying with less packaging, more reuse and repair, and other household strategies. The estimates of recycling and yard trim effects are the relevant estimates for systems with relatively convenient recycling and yard trim programs. Note, MOCO’s system does not collect food waste.

However, this estimate needs local refinement, based on local conditions. The next step was to conduct a close examination of the types of materials available for diversion from the MOCO trash stream. As it turns out, MOCO has a highly unusual residential disposal stream waste composition compared to other locations. Its composition has an extremely small percent of remaining yard trimmings, or put a different way, the MOCO system has an extremely high capture rate for yard trim. This result capped the diversion potential for yard trim. In a similar way, the amount available from recycling was checked; MOCO collects and processes and tracks paper and containers separately. These analyses were conducted separately for SD-A and SD-B.

These two limitations were considered in developing an estimate that the SAYT system would lead to a diversion rate of approximately 11 percentage points from the trash stream into diversion options.

The final step was to consider whether the container choice would affect the incentives for diversion. The consultants’ experience and past estimation work indicates that there may be a slightly greater incentive for diversion from a bag system over a container-based system. This is because, under a container-based systems, households are paying for the full container’s volume, whether they actually fill it up on a weekly basis. Thus, if the trash isn’t full, they don’t have any penalty if they leave a few of the recyclables still in the trash. Under a bag-based system, the payment doesn’t “happen” until the bag is full and put out for collection. Therefore, households are encouraged to be more meticulous about more of the diversion and recycling. Although the authors were unable to find that this effect is statistically significant, data in the area is not perfect. Therefore, as a last step, an additional reduction was assigned to bag and sticker-based systems. The final tonnage estimates for SD-A and SD-B are shown in Figure E.4. The impacts of these programs on costs, facilities, and other aspects of the waste management system are addressed in later sections of the report.

**Figure E.4: Estimated Tonnages in SD-A and SD-B**

	SD-A	SD-A	SD-A	SD-B	SD-B	SD-B
	Status Quo	Cart-based	Bag-Based	Status Quo	Cart-based	Bag-Based
Tons recycled	49,811	57,673	58,459	50,785	59,702	60,594
Tons reduced	0	5,616	6,178	0	6,918	7,610
Percent recycled & reduced	40%	51%	52%	30%	39%	40%
Including Ash	58%	66%	66%	48%	55%	56%

### Estimating Subscription (Container Size Distribution) Impacts

The second part of the tonnage and behavioral effect of importance for a SAYT study is to estimate the likely effects on changes in the volume of trash set out by households. The new trash tonnages derived above, divided by households, will provide the average tonnage set out by household. However, rate

setting for a SAYT program needs to provide an incentive. Therefore, it needs to provide households with a rate that varies based on the amount of trash set out, reflecting the variations in the amount by household. Because weight-based collection at the residential level is not yet legal-for-trade<sup>116</sup>, this incentive is represented by different volumes of trash set out – using either a bag- or a sized-container-based signal. Rate-setting, and resulting incentive-based charges to the households, will depend on the distribution of volumes needed by each household. This requires projections of the percent of households that will set out each of the different volume-based units of service. This section develops those projections. There are three steps to estimating the new distribution of service needs.

- **Base subscription:** This is the percentage of households using each "can size" under the current trash and recycling system. The base subscription is determined by observing the amount of trash (in gallons) collected during the set-out survey. It should be noted that the base subscription does not reflect the current cart sizes used by households.
- **Diversion:** This step incorporates the estimated increase in tonnage that is expected to be diverted to recycling and waste reduction because of the new rate incentive system. This estimate is based on the predicted set-out with the SAYT diversion program in place.
- **Compacted:** This step takes into account the effect of customers compressing the trash, or "stuffing" more trash into the containers to make them fit. The "compacted" can distribution is based on the predicted set-out with both the SAYT diversion and compaction effects in place.

The results of this estimation will provide a better understanding of the new subscription levels that can be expected under the new trash collection system, taking into account the effects of the rate incentives and customer behavior. This information will be useful in developing the financial and rate design aspects of the waste management system.

The main source used for this estimation is the "set-out" audit or survey that the consultant team conducted in MOCO. The design and conduct of this set-out survey is discussed in detail in Appendix C: Set-out Field Survey. The set-out survey collected data at the individual household level on the trash weights and volumes, which also allows the computation of the density of the trash set-out (pounds per gallon). The set-out survey's sample provided a distribution of all these data across the area. The "base" results from the set-out survey provide the current distribution of trash set out by a statistically significant sample of households across SD-A.<sup>117</sup>

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<sup>116</sup> "Garbage by the Pound" (GBTP) was developed by Skumatz in the late 1980s, and used RF tags and on-truck scales to charge households for the actual pounds of waste set out for collection on a route. The technology was pilot tested, fairly successfully, in more than a dozen communities. The technology was even used and adapted by RecycleBank to provide incentive-based point rewards for increased recycling. However, the US's national NIST agency determined that very stringent accuracy levels were needed to use GBTP systems for charging customers, and scales on a garbage truck, operating on rough routes every single day, were not able to achieve that accuracy on a regular basis. Thus, the system has not been made legal for trade. For more information, see Skumatz, PAYT / Variable Rates In Solid Waste: Using Economic Signals To Increase Recycling And Reduce Waste, Technical report prepared for The Reason Foundation, Los Angeles, March 2001. Also see Sasao et al., 2021. "Does weight-based pricing for municipal waste collection contribute to waste reduction? A dynamic panel analysis in Flanders," (<https://www.sciencedirect.com/science/article/pii/S0956053X21002543>)

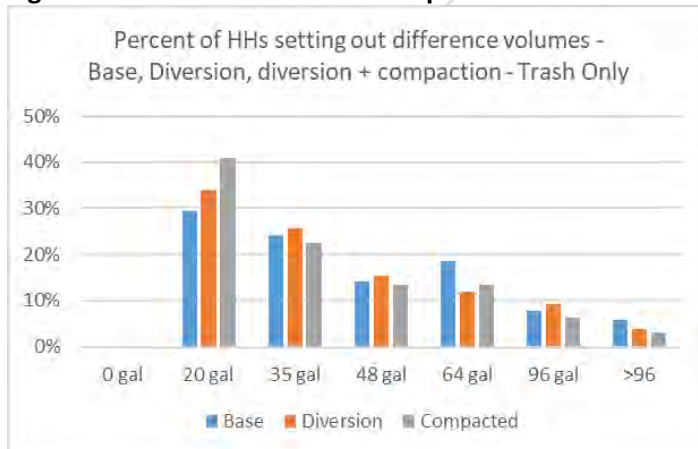
<sup>117</sup> Because SD-B is served by multiple haulers on different sets of days, it was not feasible to conduct a second set-out survey in that area. Instead, the consultants used information from the customer web survey that the consultants conducted, to see if

A simplified description of the approach to the needed results follows. Starting with the set-out survey’s distribution of pounds set out, the average tonnage reduction estimated from the section above was applied to all the households. This was the “diversion effect,” and it “shifted down” the distribution of trash tonnages set out by the households. Next, the average pounds per gallon was applied to provide the distribution of households by container size. Finally, a third step was applied. With a new rate system, there is an incentive for the households to get every bit of trash they can into the container; they pay more if they need a bigger container. Therefore, SAYT leads to a compaction, or stuffing, or “stomping” effect. We reviewed the distribution of the density data (pounds per gallon in the cans) from the MOCO set-out survey, and assumed that the households would have an incentive to stuff more into each can than they did in the status quo system, which does not provide that (not-so-desirable) incentive. This impact of “stomping” (compacting waste to reduce volume), results in revised revenue unit estimates. The final columns in Figure E.5: Estimated New Subscriptions based on Three Effects and Figure E.6: Estimated New Subscriptions based on Three Effects, show the resulting projections of volume-based service needs the County’s residential in SD-A and SD-B would have.

**Figure E.5: Estimated New Subscriptions based on Three Effects (usage and revenue units)**

Pct on	Base	Diversion	Compacted
0 gal	0%	0%	0%
20 gal	30%	34%	41%
32 gal	24%	26%	23%
48 gal	14%	15%	14%
64 gal	19%	12%	13%
96 gal	8%	9%	6%
>96 gal	6%	4%	3%

**Figure E.6: Estimated New Subscriptions based on Three Effects, Graphical Representation**



customers reported significantly different trash set outs between the two subdistricts. The statistical analysis found this did not represent a statistically significant difference at 90% confidence, so the set outs from the set-out survey would be a valid approximation of the distribution for both MOCO subdistricts.



## Summary

This section provides needed data on tonnage and subscription estimates from the SAYT system. The tonnage estimates drive collection and facility use analyses. The impacts of these changes in the subscription rates have effects on rate design and cart purchases later in this study. The results provide information related to tonnage and trash cart set outs under the new program.

The new waste management program is expected to result in a significant shift towards the diversion and greenhouse gas (GHG) reduction goals<sup>118</sup>. It is estimated that the program will result in a reduction of 10 or more percentage points in the amount of waste being sent to landfills and incinerators, and an increase in the amount of waste being recycled.

As a result of these changes, the tonnage of waste being processed by facilities like Montgomery County (MOCO) and others is expected to decrease, with a shift downward in the trash volumes used.

In summary, the new waste management program is expected to have a significant impact on the tonnage and trash cart set outs in the area, bringing the County closer to its diversion and GHG reduction goals as seen in Figures E.7 and E.8. The program is expected to result in fewer tons of waste being sent to landfills and incinerators, and more being diverted to recycling, which will reduce the overall waste volumes used and impact the revenues generated from trash collection.

**Figure E.7: MOCO Single-Family Current and Predicted Diversion Rates**

DIVERSION RATES	Aggressive		Less Aggressive	
	Current	With SAYT	Current	With SAYT
Subdistrict A	39%	50%	39%	47%
Subdistrict B	29%	39%	29%	36%
Subdistricts A&B	34%	43%	34%	41%
CART DISTRIBUTION	Current	With SAYT	Current	With SAYT
32 gallon	-	54%	-	40%
64 gallon	-	28%	-	40%
96 gallon	-	16%	-	15%
>96 gallon (2 <sup>nd</sup> cart)	-	2%	-	5%

*Table Notes: Current diversion based on average tons generated and diverted from 2017, 2018, 2019, and 2021 from information provided in data request item 2.b – County provided tonnages of trash, recycling, organics. Current and new diversion rates include commingled materials, mixed paper/OCC, yard trim, scrap metal, and source reduction.*

<sup>118</sup> See MOCO Supporting Model for calculations.

**Figure E.8: MOCO Single-Family Current and Predicted Capture Rates**

			Commingled Materials	Mixed Paper, OCC	Yard Trim	Scrap Metal
Subdistrict A	More Aggressive	Current	72%	68%	80%	35%
		W/SAYT	84%	87%	82%	66%
	Aggressive*	Current	72%	68%	80%	35%
		W/SAYT	84%	87%	82%	66%
	Less Aggressive	Current	72%	68%	80%	35%
		W/SAYT	81%	82%	82%	58%
Subdistrict B	More Aggressive	Current	59%	58%	76%	23%
		W/SAYT	75%	75%	77%	29%
	Aggressive*	Current	59%	58%	76%	23%
		W/SAYT	73%	73%	77%	28%
	Less Aggressive	Current	59%	58%	76%	23%
		W/SAYT	70%	69%	77%	27%
Countywide (A&B)	More Aggressive	Current	64%	62%	78%	29%
		W/SAYT	79%	80%	80%	47%
	Aggressive*	Current	64%	62%	78%	29%
		W/SAYT	78%	79%	80%	46%
	Less Aggressive	Current	64%	62%	78%	29%
		W/SAYT	74%	75%	79%	42%

Table Notes: Current capture rates based on average tons generated and diverted from 2017, 2018, 2019, and 2021 from information provided in data request item 2.b – County provided tonnages of trash, recycling, organics. The consultants also developed alternate scenarios for the effectiveness of the SAYT program assuming the diversion incentive is less or more effective. The “Less Aggressive,” alternate scenario estimates a new total capture rate of 75% and a new diversion rate of 41%. The “More Aggressive,” scenario estimates 10% more capture.

\* Aggressive values are used throughout the report, unless noted otherwise.

## E.4 RATE INCENTIVES AND RATE-SETTING

### Research on PAYT Rate Design Guidelines

Logically, the County might think that the greater the financial incentive for decreasing trash can size (or the greater the penalty for higher service levels), the greater the recycling achieved. Even if this is true, there is considerable financial risk to a rate structure that becomes very “aggressive”. Rates are designed to raise revenues sufficient to cover the cost of providing collection service. The cost structure for providing trash service is a high fixed cost and low marginal cost (or a low cost for collecting an extra pound or can of trash at a household). If a system is to provide a substantial financial incentive to reduce trash volumes, then some of the cost of basic collection for low subscription levels ends up being subsidized – and the only place to get that subsidy is to assign higher costs to the large trash subscribers. The greater the price differential, the greater the transfer, and the greater the risk of not recovering all the revenues needed to fund basic collection.<sup>119</sup> We analyzed whether there is an optimum.

<sup>119</sup> There can be a concern about “subsidies” and paying fair shares. The residential sector as a whole is not necessarily subsidized under a PAYT system (unless the County chooses to subsidize it from general fund, commercial customers, or elsewhere). However, there are usually some subsidies of low users by high subscribers in order to create a more effective financial incentive under the PAYT system.

## Balancing Incentive, Performance, and Risk<sup>120</sup>

**Rate incentives and specifically, PAYT rate differentials can be a driver for successfully increasing diversion.** In previous quantitative research<sup>121</sup> (Skumatz 2001, 2013 and others), it was found that a community can achieve the same recycling or diversion levels from a PAYT rate differential of 80% more for double the service. Less than this achieves less recycling – and the research indicates that an incentive or differential of less than 50% for double the service volume – is much less effective. That implies a goal for effective PAYT price differentials is between 50% and 80% for double the service, with a bias toward higher levels.

The study assessed a community's incentives by comparing rates for 64 to 32-gallon service levels (including embedded recycling costs).

The study used data from a large nationwide database collected by the authors<sup>122</sup> and statistically analyzed a wide range of PAYT factors that might affect recycling, including system type, variations in incentive levels (differentials), and container sizes. One key factor that was systematically important to reaching higher levels of diversion was whether the community offered a mini- or micro-can option in a PAYT program – a 10 or 20 gallon container at a lower price. Mini-cans apparently work.

### PAYT Rate differentials – How much is enough?

The study also investigated the break points at which PAYT incentive levels become effective. The question of how much rate incentive / percent increment is “enough” vs. potentially “too much” in a PAYT system is an important one. Having too little incentive leads to a lot of administrative and political effort for barely any recycling impacts compared to a flat rate, and a shortfall in the diversion potential and equity benefits associated with PAYT. But there are difficulties associated with too high an incentive as well. There were those early on (specifically in California) that expected to “more than double” the rates for double the (gallons of trash) service, arguing for the strongest possible diversion incentive. The two main areas of difficulty from this kind of “too high” rate incentive are:

- Potential to anger residents, leading them to increase litter / illegal dumping, and complain.
- Revenue certainty problems.

To explain the balancing act on the second issue, consider the following. Communities (and haulers) set rates to recover revenue requirements<sup>123</sup>, and the cost of service is, in the largest proportion, the cost of getting trucks to the door, not the tonnage collected.<sup>124</sup> If too much of the cost of (collection) service is loaded onto the larger cans (which it must be if incentive-based rates are charged),<sup>125</sup> and the incentive is too successful, the system may mis-predict the number of customers signing up for larger cans, and

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<sup>120</sup> This section relies heavily on a nationwide study by Skumatz, “Recycling Best Practices Study: Practical and Effective Methods to Move Recycling Forward”, Skumatz Economic Research Associates, November 2013.

<sup>121</sup> Skumatz, “Maximizing Vr/Payt Impacts – Policies, Rate Designs And Progress”, Resource Recycling, June 2001, and Skumatz, “Recycling Best Practices Study: Practical and Effective Methods to Move Recycling Forward”, Skumatz Economic Research Associates, November 2013.

<sup>122</sup> Data collected by Skumatz Economic Research Associates (SERA), Superior Colorado, including programmatic, cost, demographics, and other data from more than 1,000 communities nationwide.

<sup>123</sup> Plus profit, for a hauler, or plus an allowed net income in some communities.

<sup>124</sup> The literature often suggests the collection cost is 80-90% of the rates charged for service. Obviously, this varies depending on labor rates and tipping fees. The inverse is that 10-20% of the cost of collection [is the tip fee / disposal part].

<sup>125</sup> PAYT are still rates that cover the cost of service for the class appropriately.

the system runs a risk of not covering the basic costs of door-to-door service. The funds for the subsidy for lower cans do not materialize. The farther that the rate design deviates from strict cost of service by size, the greater is the risk of under-recovery of costs.

It is best to find the rate optimum: high enough to provide a recycling incentive, but not so high that the system's economics are in jeopardy.

As a consequence, we conducted statistical work to analyze the impacts of different levels of incentives. The data from the PAYT communities around the country were used in regressions to assess the two ends: the cost at which rate incentives seem to "kick in" (increase recycling), and the differential at which no additional diversion incentive seems to result. We tested both dollar value differentials (between the 30 and 60 gallon containers), and the percentage differences (same container sizes – the percent extra charged for this "double the service" option).

Dollar differences of greater than \$5-6 / month for moving from 30 to 60 gallon container sizes were significant and positive, adding substantial diversion (about 4-7 percentage points to recycling beyond those programs that charge less). The impacts did not increase a great deal with larger rate differentials, but the study did find that differentials in the \$8-10 range were solidly at the high end of the range. The analysis of percentage differentials showed that the greatest additional recycling is achieved when the price for the 60 gallon container is between 50% and 80% more than the price of the 30 gallon container. This added nearly 9 percentage points of diversion. The recycling results were smaller for rate differentials outside this range.

The study notes that the analysis is based on "all together" rates – defined as no separate fees broken out – the total that the household sees. The study also assumes that, once the rate differential for 30 and 60 gallons is "set" (defined by dollars, or by percentage, but then translated into dollars), the same dollar differential is used for moving from 60 to 90 gallons – for each 30 gallon increment, excluding the setting of rates for a mini or micro can (about 20 or 10 gallons, respectively).

Communities with stalled recycling and PAYT should consider checking whether the rate differentials should be revised to be consistent with the research; higher recycling can be achieved if 50-80% differentials are charged for double the service (assuming small container sizes like 32 gallons are available).

**Figure E.9: PAYT Program Design Results (Source: Skumatz, Lisa A. Skumatz Economic Research Associates, statistical research, 2012-2015)**

PAYT Program / Policy Factors	Range of Impact on Recycling Percentage (percentage points ADDED to existing recycling rate in town) <sup>126</sup>
Mini- or Micro trash can be offered (10-20 gal)	Substantial increase
Optimal rate differentials moving from 30-60 gallons (dollar differentials)	Minimum \$7; strong impacts \$7-\$12 <sup>127</sup>
Optimal rate differentials moving from 30-60 gallons (percentage incentives)	50%-80% of 30-gallon rate <sup>128</sup>
<b>Socio-demographic factors</b>	
Low tipping fees	Less recycling
Large community	Less recycling

### E.5 System Design Feasibility – Containerization Type and Ownership Options

Five options for containerization for delivery, collection, and ultimate charging methods for trash to the curb were developed and analyzed:

1. Carts, sized to different volume levels, collected via semi-automated collection. Semi-automated collection service is the method currently used in MOCO.
2. Pre-paid Logoed Bags (or bags with prepaid stickers) set out for collection at the curb; again, semi-automated collection is assumed.
3. Customer-supplied bags with Prepaid stickers affixed that are set out for collection at the curb; again, semi-automated collection is assumed.
4. Prep-paid logoed bags placed in carts for collection via semi-automated service.
5. Carts, sized to different volume levels, collected via fully-automated collection. Fully automated collection would be a change from current collection. It would need more expensive trucks, but fewer staff. This cannot be used in 100% of MOCO's territory (overhead wires, on-street parking, hills and other barriers can obstruct its use), but can be used in some portion of the County, with potential savings<sup>129</sup>.

There are advantages and disadvantages to each of these containerization options, listed below, in turn.

#### **Sized carts collected via semiautomated service – Advantages:**

Carts are convenient. Sized carts provide a convenient option for households to manage their waste, as they clearly define the limits of the amount of waste that can be placed in each cart. The defined limits of each cart make it easier to charge households for their waste disposal, as the volume of waste is easily measurable. The defined limits and regular measurement of waste in the carts, along with the

<sup>126</sup> The only other indicative finding was that hybrid programs may lead to higher recycling than bag or tag systems or can systems. This result is inconsistent, however. This is different from earlier results that indicated bag systems delivered higher recycling levels than can-based programs (Skumatz, Lisa A., SERA 2000).

<sup>127</sup> Differentials smaller than this value were less effective than \$7 differentials, which tended to have negative signs, indicating the incentive was too small to be effective in increasing recycling rates. Similarly, the impact on recycling diversion decreased for dollar differentials higher than \$11 or \$12.

<sup>128</sup> This range had the highest recycling incentive, adding substantial percentage points of PAYT recycling performance; other differentials had lower impacts, controlling for additional impacts of mini/micro cans, low tipping fees, and large communities.

<sup>129</sup> Montgomery County estimates that 20% of the County can be collected with fully automated collection.

fact that the households keep the same sized cart for months or years, provide a consistent source of revenue for the collection system. Finally, the defined limits of each cart make it easier to enforce waste disposal rules and regulations, as any violations are easily noticeable.

#### **Sized carts collected via semiautomated service – Disadvantages:**

There are substantial costs for the carts, their distribution, and maintenance. Implementing a container-based option can be expensive, when scaled up to a whole-county level. The size of the carts may present a challenge for households with limited storage space for the carts when they are not in use. The carts may be difficult for some households, particularly those with disabilities, to handle and move to the curb for collection. Importantly, the containerization option may not provide an adequate solution for bulky items, and a separate system may be needed to address the disposal of these items<sup>130</sup>. Finally, semi-automated collection using three staff is relatively expensive, compared to fully automated collection; however, we have noted 100% of the County cannot be collected via fully automated collection<sup>131</sup>.

#### **Prepaid bags on the curb – Advantages:**

The bag system is simple and straightforward, as households pay for the bags they use. They are not incentivized to “fill the bag” because they are paying for it anyway. The bag system provides flexibility in waste disposal, as households can purchase and use as many or as few bags as their needs vary. The bag system is clear and easy to understand, as households only need to purchase and use the bags they need. Bag systems may also (slightly) increase the amount of waste that is diverted from landfills, as it provides a clear, flexible option for households to manage their waste. Finally, the collection of bags does not require the return of a cart to the curb, making the collection process faster and more efficient.

#### **Prepaid bags on the curb – Disadvantages:**

Bags represent a continuing cost to the household. The cost of purchasing bags can be a continuous burden for households, as they must continually purchase bags for their waste. Carts are paid off at some point. The availability of bags may be a challenge, particularly in areas with limited access to stores that sell the bags. The bag system may provide less regular revenue for the collection system, as the revenue is dependent on the households purchasing bags. A very important negative is that the collection and handling of bags may pose a risk of injury to waste collection workers; this has been demonstrated in a nearby community.<sup>132</sup> Bags left at the curb can attract vermin and create public health and safety issues. The bag system may also result in the use of more plastic bags, creating an environmental issue. Finally, bags left at the curb may impact the aesthetics of the neighborhood and create litter issues.

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<sup>130</sup> *This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.*

<sup>131</sup> *Montgomery County estimates that 20% of the County can be collected with fully automated collection.*

<sup>132</sup> *Aberdeen, MD, found they had 12 worker injuries per year from a sticker-based system (identical to a bag system in collection method). They had only 0.03 injuries per year when they switched to a cart or totter-based system.*

**User-supplied bags with prepaid stickers affixed, on the curb – Advantages:**

Sticker systems have most of the same benefits as the pre-paid bag system mentioned above. In addition, they are more flexible and can be placed on bulky items as well. They are lower cost to manufacture and take up less storage space at home before use.

**User-supplied bags with prepaid stickers affixed, on the curb – Disadvantages:**

Sticker systems have most of the same disadvantages as bags (including worker safety). However, they are harder to enforce size limits because customers supply their own bags. In addition, breakage / scatter may be worse because customers may use the cheapest bags which tend not to be the strongest.

**Prepaid bags in Carts – Advantages:**

The Bags in Carts system addresses some of the concerns with the on-curb bag and sticker systems, such as vermin and injury issues. The “look” on the street is also more attractive, and can be uniform, if the containers are provided, as opposed to user-supplied.

**Prepaid bags in Carts – Disadvantages:**

The Bags in Carts system comes with its own set of cons, including the need to watch the dump to enforce that only prepaid bags are used. In addition, carts are needed, and whether they are owned by households or the County, there is an expense for this.

**Sized carts with Fully-Automated Collection – Advantages:**

Most of the advantages of this option are the same as the first sized-cart option. The Sized Carts with Automated Collection system offers additional advantages, including lower staffing costs, fewer injuries, longer worker lifetime and better conditions, and higher collections per hour.

**Sized carts with Fully-Automated Collection – Disadvantages:**

Most of the disadvantages are the same as the first sized-cart option. However, there are also some extra drawbacks to consider, such as the limited use in certain territories due to overhead wires or on-street parking barriers, as well as the need for more expensive trucks and specialized carts. In addition, this system requires backup, as well as more expensive trucks.

Figure E.10: Summary of Containerization Options Pros and Cons summarizes the advantages and disadvantages of each of the systems. Overall, each system has its own pros and cons, and the best option depends on weighing the advantages and disadvantages. Regardless of the option selected, enforcement, outreach, and education will be an important component of explaining the new containerization system and its requirements to the households.

**Figure E.10: Summary of Containerization Options Pros and Cons**

Option	Pros	Cons	Other
Sized carts with semi-automated collection	<ul style="list-style-type: none"> <li>• Convenience</li> <li>• Clear limits</li> <li>• Easy to charge</li> <li>• Regular revenue</li> <li>• Easy to enforce</li> </ul>	<ul style="list-style-type: none"> <li>• Cost of carts and distribution</li> <li>• Storage space</li> <li>• Infirm / handling</li> <li>• System to address bulky, enforce</li> </ul>	<ul style="list-style-type: none"> <li>• Common</li> </ul>
Prepaid Bags on curb	<ul style="list-style-type: none"> <li>• Simple, pay for use</li> <li>• Flexibility</li> <li>• Clear / easy to understand</li> <li>• Divert a little more</li> <li>• Collection speed – don't need to return cart to curb</li> </ul>	<ul style="list-style-type: none"> <li>• Continuing cost to Household</li> <li>• Availability when needed</li> <li>• Less regular revenue</li> <li>• Injuries</li> <li>• Vermin issues</li> <li>• More plastic bags (bags in bags)</li> <li>• Aesthetics</li> </ul>	<ul style="list-style-type: none"> <li>• Common</li> <li>• Concern re: injuries, on-going cost to households</li> </ul>
Stickered bags on curb	<ul style="list-style-type: none"> <li>• Similar to bags, but also amenable to more sizes / shapes / bulky</li> <li>• Lower cost, smaller to store</li> </ul>	<ul style="list-style-type: none"> <li>• Similar to bags except less costly but also: need to buy bags &amp; stickers,</li> <li>• Enforcement of use &amp; spillage</li> </ul>	<ul style="list-style-type: none"> <li>• Concern re: injuries, spillage</li> </ul>
Bags in Carts	<ul style="list-style-type: none"> <li>• Addresses vermin, injury, spillage issues</li> <li>• No varying cart sizes / one size or open</li> </ul>	<ul style="list-style-type: none"> <li>• Bag issues above plus: Need to watch dump to enforce; pay for carts &amp; bags</li> </ul>	
Sized carts with Automated collection	<ul style="list-style-type: none"> <li>• Cheaper, high collections/hour</li> <li>• Lower staffing</li> <li>• Few injuries</li> <li>• Longer worker lifetime, better conditions, retention</li> </ul>	<ul style="list-style-type: none"> <li>• Not 100% of territory/backup</li> <li>• More expensive trucks</li> <li>• Requires carts</li> </ul>	<ul style="list-style-type: none"> <li>• Common</li> </ul>

### Policy / System Design Results Discussion and Rationale – Containerization

Based on the pros and cons, the consultants did not prefer bag and sticker options because of safety concerns with loose pre-paid bags or stickered-bags on the curb. The prepaid bags-in container-option was also not referred because it is expensive, considering the purchase price for expensive carts (by MOCO or customers) and customers having to purchase bags or stickers forever, as an added expense. Enforcement to check if all waste within the container was in a prepaid bag was also considered an extra operational expense that would be eliminated with the sized-container options. Sized containers are also one of the most common and successful options for SAYT programs. The consultants discussed these options with the County. The County was concerned about the factors listed above, especially the safety aspect.



**Policy / System-Design Results – Feasibility-Level:** Eliminate loose bag and stickers options, and the bags-in-cans options from serious consideration in the implementation plan for main collection. Different colored bags or stickers may be necessary for overflow options.

## E.6 Container Ownership Options – Feasibility Analysis

Cart-based systems can be expensive, especially at a County-wide level. Costs include purchase, distribution, switch-outs, storage, and maintenance. There are four main options for container ownership:

- Household owned / supplied carts
- Hauler-owned / supplied trash carts
- County-owned / supplied trash carts
- Leased trash carts

The key factors to consider when evaluating the four options for the ownership of trash carts for the new system are summarized below. They are also included in Figure E.11.

- Option 1, Household-owned / supplied trash carts, provides a low-cost solution to the county as households are responsible for purchasing and maintaining their own carts. However, this option can lead to a lack of uniformity and enforcement challenges if households are not following the rules.
- Option 2, Hauler-owned / supplied trash carts, provides a low cost solution to the county, but the carts may not be uniform in size or appearance and the haulers have an advantage in re-bidding for the trash collection contract.
- Option 3, County-owned / supplied trash carts, provides uniformity and easy enforcement, but it is the most expensive option as the county must bear the costs of delivery, assembly, replacements, repairs, and storage.
- Option 4, Leased trash carts, provides a lower up-front cost, but the total cost may be higher over time due to the costs associated with leasing the carts.

Ultimately, the choice of ownership for the trash carts will depend on factors such as the cost and funding considerations, the need for uniformity and enforcement, political considerations/ blow-back from customers, and local policies.

**Figure E.11: Summary of Pros and Cons for Cart Ownership Options**

Option	Pros	Cons	Other
Household-owned /	<ul style="list-style-type: none"> <li>• Low cost to county</li> </ul>	<ul style="list-style-type: none"> <li>• Not uniform</li> </ul>	

Option	Pros	Cons	Other
supplied trash carts	<ul style="list-style-type: none"> <li>No delivery / assembly / replacements / repairs / storage</li> </ul>	<ul style="list-style-type: none"> <li>Enforcement people aren't putting out different than subscribed</li> <li>Complaints when containers are not handled with care</li> </ul>	
Hauler-owned / supplied trash carts	<ul style="list-style-type: none"> <li>Low cost to county</li> <li>No delivery / assembly / replacements / repairs / storage</li> <li>Enforcement is easier than with household-supplied carts</li> </ul>	<ul style="list-style-type: none"> <li>Not uniform in size / appearance</li> <li>Owned by hauler so hauler has advantage at re-bid</li> </ul>	<ul style="list-style-type: none"> <li>Not preferred because of rebid</li> </ul>
County-owned / supplied trash carts	<ul style="list-style-type: none"> <li>Uniform</li> <li>Easily enforced</li> <li>Owned by county, so all haulers even at re-bid</li> </ul>	<ul style="list-style-type: none"> <li>Cost</li> <li>Delivery / assembly / replacement / repairs / storage</li> </ul>	<ul style="list-style-type: none"> <li>Can hire delivery etc.</li> </ul>
Leased trash carts	<ul style="list-style-type: none"> <li>Lower up-front costs</li> </ul>	<ul style="list-style-type: none"> <li>More total cost</li> </ul>	<ul style="list-style-type: none"> <li>County can pay owned carts over time</li> </ul>

**Policy / System Design Results Discussion and Rationale – Cart Ownership**

Based on the pros and cons, the consultants would identify as most feasible that the county purchase the needed containers county-wide, borrowing from solid waste funds. Alternatively, in SD-B, where the County will likely be undertaking contracting with new haulers, the purchase, distribution, and maintenance of containers can be made part of the proposal requirements. The contract terms should require that, after the term of the contract, the County will be able to obtain ownership of the containers for \$1 each or another fixed or zero price. The contract period should be at least 5 years to allow a reasonable time for the haulers to recoup the cost of purchase, delivery, and maintenance of the carts within their bid prices. In this latter option, the County will only have to outright fund the purchase of the new carts needed in SD-A, net of any existing carts that can be shifted around.

- Major considerations regarding cart ownership (SD-A and SD-B variations included)
  - Household: enforcement/uniformity, cost, low County / hauler hassle
  - Hauler: pushback from SD-B, cost, re-bid advantage
  - County: uniformity, re-bid equity, but cost & maintenance; depends on collection options selected for area A and Area B of the County

## E.7 Addressing Mitigating Factors – Feasibility Analysis

SAYT has many advantages, but it also brings concerns about negative effects like illegal dumping. The feasibility analysis analyzed a number of these concerns, specifically:

- Illegal dumping
- Addressing bulky collection
- Overflow
- Non-payment of bills
- Low income / vulnerable customers
- Contamination
- Vermin
- Injuries
- Outreach and education

The feasibility analysis reviewed the literature, and the reflected experiences of communities across the country. A total of 35 strategies to address these options were identified and assessed for their suitability for the new SAYT system as a whole, or for the nuances involved in bag vs. can options, and for the operations in SD-A vs. SD-B. Those readers interested in more detail by strategy should review Appendix F: Mitigating Negative Effects, which includes tables of strategies and their viability for the new system or for SD-B, and should review the in-depth work on these strategies included in Appendix F: Mitigating Negative Effects.

Effective illegal dumping mitigation will require use of multiple strategies, including options such as more enforcement staff; an on-going system for bulky (prepaid tags or bags) and a balance in the number of free clean-ups or drop-offs or an appointment system – enough service to reduce illegal dumping and address bulky items, but not so many convenient options that the operation of the SAYT system is undermined. Feasible options are in place in many communities, and these are narrowed down in the report’s discussion.

Effective means of addressing overflow includes the need for a charging system for the extras. This is readily accomplished in most locations via a system of photos and haulers adding charges to the bill. In MOCO, where the bill will not generally be coming from the hauler, and the bill is also unlikely to be frequent enough to address this overflow issue, a prepaid bag system, specifically for overflow and/or bulky items, will be one of the preferred options. One promising suggestion is to consider allowing the haulers to receive the revenues for this system. That will incentivize them to enforce the avoidance of overflow and “cheating” on the program. This option is relevant for both bag systems and cart-based systems. Another option is the County provides stickers for purchase at retail outlets for additional trash.

If special policies for low-income have MOCO precedent or are a concern, the preferred options for addressing this within the likely system design include discounted charges for their cart sizes (or for the smallest cart size). There is not statistical evidence of increases of long-lasting illegal dumping or contamination in association strictly with new SAYT programs, but there are dozens of strategies for

addressing contamination included in the literature.<sup>133</sup> Non-payment of bills is unlikely to be any concern in MOCO. The preferred charging option is through the tax bill; that allows extremely strong enforcement of unpaid bills.

The two remaining negative impacts are virtually solely a concern with bag / sticker programs on the curb – vermin, and injuries. Vermin are only a small issue with carts, and there are no known effective strategies for addressing vermin problems with a bag / tag program. Injuries come from lifting and swinging heavy prepaid bags or tagged bags. Carts are rolled to lifters, for the most part, and injuries are dramatically lower, and are nearly non-existent with fully automated collection.

The conclusion of the feasibility study is that all these possible negative effects can be addressed with well-tested strategies. Finally, a very important part of successful mitigation strategies for these possible negative effects is strong outreach and education, so all understand the new system. See the report’s discussion and Appendix F: Mitigating Negative Effects, for more information. The Feasibility Study and the Implementation Plan have estimated the costs and staffing sufficient to implement mitigation strategies for each of these negative effects, and these costs are included in the budget.

## E.8 Facility Effects – Feasibility Analysis

Montgomery County (MOCO) is concerned about the challenges in processing additional recyclable materials due to the implementation of SAYT and tonnage shifts. The program will result in changes in the quantities of waste and recyclables received by the facilities. For the feasibility analysis, the consultant team conducted a review of the high-level numbers related to the facility, to generate planning level numbers for the facility impacts, and the cost impacts from SAYT.

The initial numbers provided on the facility follow, along with the study team’s understanding of the operations:

- The County's Comingled Container Line (CCL) is designed to process 80 tons per day (TPD) or 10 tons per hour (TPH). Currently, it is receiving more material than it is designed for.
- The County's Paper Processing Facility (PPF) is designed to process 25 TPH of mixed paper and cardboard (OCC) and is currently receiving 175-230 TPD (or 22-29 TPH).
- Yard trim is being delivered to an off-site facility.<sup>134</sup>

The County provided cost-based information in the form of combined per-ton costs of collection and processing for each collected stream including recycling, yard trim, and trash. This study was focused on identifying the incremental impacts of a SAYT program on the existing system.

The study was also concerned about the feasibility of SAYT in the medium and longer run. Results for accommodating additional material at the Comingled Container Line (CCL) and the Paper Processing Facility (PPF) can be found in the main body of the report under “Processing and Disposal Site Full Implementation Recommendations.”

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<sup>133</sup> A particularly useful source is the website for the Recycling Partnership, which specializes on this topic.

<sup>134</sup> Records indicated the yard trim material was going to Montgomery County Dickerson Yard Wastes Composting Facility. Food scraps from the pilot are going to an off-site facility, but, per discussion with MOCO, impacts related to this pilot program are excluded from our analyses.

## E.9 Summary of the Feasibility Analysis

The goal of the project is to design a feasible Save-As-You-Throw (SAYT) program for Montgomery County. The project included a range of supporting analyses to ensure that the SAYT program is practical and effective in the County. The focus areas for the study included the potential impacts of the SAYT program on the County's existing waste management system, including the facilities, processes, and costs involved. Additionally, the project examines feasible strategies for mitigating possible negative impacts associated with the program, for example illegal dumping, contamination, overflow, and other topics. The study also examined the most appropriate outreach and education efforts to ensure the success of the program. Finally, the study developed a feasible set of rates and billing system that could make the system and its funding secure and equitable. By considering all of these factors, the project aimed to develop a comprehensive and feasible SAYT program for Montgomery County.

Phase 1 of the project conducted a feasibility analysis. It developed planning level estimates of the effects from the SAYT program for Montgomery County. The main objective of this phase was to identify feasible and sustainable scenarios and options for the implementation of the program. To achieve this, the phase analyzed various aspects of the waste management system in both SD-A and SD-B, including impacts on:

- the estimated tons of waste generated,
- the flow of waste within the system,
- container and collection / service delivery options,
- impacts on the system and facilities,
- options for mitigation strategies and options for sensitive groups, such as low-income and vulnerable populations,
- estimated cost changes, and
- potential rate and fee effects.

The study assessed pros and cons for each option and policy choice, along with overall cost, diversion, convenience to residents, and worker safety. The resulting analysis identified some SAYT design options that were feasible, and others that were less so. The feasible options were forwarded to Phase 2 of the project for in-depth analysis and implementation design work. This information provided a solid foundation for the implementation of a feasible and effective SAYT program in Montgomery County. The results of Phase 1 of the SAYT program design for Montgomery County provide a valuable insight into the various scenarios and options that were evaluated. The analysis showed the following:

- **Effective:** SAYT in SD-A and B can increase diversion and be successful, but it is crucial to address the capacity and operation issues of facilities.
- **Sized Containers preferred:** The pre-paid bag/sticker system without cans was not preferred, due to reservations about risk of worker injuries, litter / scatter concerns, and compatibility with automated collection.
- **Mitigation of Negative effects:** The Phase 1 analysis of designing a feasible SAYT program for Montgomery County found there are feasible mitigation strategies available for all of the negative effects that may arise from the implementation of such a program. This includes issues such as illegal dumping, non-payment, overflow and bulky waste, low-income and vulnerable groups, contamination, vermin, and injuries. The cost of enforcement for these mitigation strategies is affordable. On the other hand, feasible mitigation options were available for all the negative effects that were identified.

- SD-B via multiple contracts: Phase 1 results showed that in SD-B, the design of a feasible SAYT program requires careful consideration of tradeoffs between control and performance of the system, such as same-day collection that is highly desired by residents, and the potential pushback from haulers. The results indicated that the implementation of either an ordinance or a franchise agreement could achieve the primary goals of the program, while reducing the likelihood of strong pushback from haulers. The results indicate that contract(s) for the Solid Waste District B can be efficient and the county is willing to consider this option. Ordinances are a second-best strategy.
- Capacity concerns: Facility capacity is also an important factor. The feasibility analysis indicates there are options to allow the system to handle the shifts in material, but this needs to be analyzed in detail for both near and long-term options.
- Possible improvements in satisfaction: The study found that the level of satisfaction with trash collection services in SD-B is lower compared to SD-A (see Appendix D: Web Survey), which presents an opportunity for improvement through the implementation of a SAYT program.
- Outreach is Important: The implementation of a SAYT program also requires strong outreach efforts, as the change in system will require a shift in behavior from residents. A successful SAYT program cannot be limited to traditional outreach methods and new strategies must be implemented.
- Revenue risk concerns: While revenue security can be achieved, it can also harm incentives, which is a factor that requires further detailed analysis in Phase 2.
- Consider automation: The results showed that the fully-automated cart-based systems had lower levelized costs and had high rankings in other factors, without loss of levels of diversion. Even if selected, however, it cannot be used in 100% of the service territory.

Phase 2 of the project aims to further refine and detail the cost and design analysis for the implementation of a feasible SAYT program in Montgomery County. The results of Phase 1 provided a general overview of the various scenarios and options available, as well as the potential impacts of each option. However, in order to move forward with the implementation, a more in-depth analysis of the costs and design is required. This will be done through the collection and analysis of more specific data and information. Phase 2 then creates a comprehensive implementation plan and the development of recommendations for the financial results and options that are available. This will allow for a well-informed decision to be made about the best course of action for implementing a successful SAYT program in Montgomery County.

## APPENDIX F: FEASIBILITY ASSESSMENT - DISCUSSION OF MITIGATING NEGATIVE EFFECTS

SAYT systems are flexible and adaptable, effective at providing an incentive for waste diversion. However, there can be negative effects. This appendix addresses some of these effects at a feasibility planning level.<sup>135</sup>

This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.

### ***Illegal Dumping***

**Figure F.1 – Mitigating Illegal Dumping**

Possible Options
<ul style="list-style-type: none"><li>• Examine the dumped material to identify the violator (i.e., mail pieces)</li><li>• Rapidly remove illegal dumping to discourage continued use of the site.</li><li>• Consider rates with requirements for everyone to subscribe / pay for a small level of service to reduce the incentive to dump</li><li>• Incorporate bulky waste collection program through appointment or similar, or bag / tag option for oversized items (with size limits)</li></ul>

Illegal dumping is one of the first worries when communities consider going to SAYT. However, in reality, dumping does not appear to be a serious problem, based on research in SAYT communities. Illegal dumping exists in virtually every community now -- the question is whether illegal dumping will increase significantly in response to a new SAYT system. One complicating issue is that very few communities have quantitative information on how big a problem illegal dumping is before they put in new rates -- making it tough to compare changes. However, because illegal dumping is almost always a fear, and because people will be looking for dumping, illegal dumping will be noticed, whether or not it actually increases over pre-SAYT levels.

Several studies have attempted to address the illegal dumping issue (based on interviews with more than 500 SAYT communities), and the conclusions are:

- ▶▶ **Low Incidence:** Illegal dumping is a problem in a minority of communities (about 20-25%), and all the communities surveyed said the problem was short-term and illegal dumping should not be considered a barrier to SAYT. The research showed the program was a much bigger fear up-front than real experience after implementation.<sup>136</sup>
- ▶▶ **Strategies:** The illegal dumping problem can be addressed and can through a variety of enforcement strategies.<sup>137</sup>

<sup>135</sup> *Econservation 2015*

<sup>136</sup> *Econservation 2015*

<sup>137</sup> *Econservation 2015*

- ▶ **Bulky Items:** Incorporating a bulky waste collection program (by appointment, limited number of “free bulky” tags, a charge per item, or other strategies), can go a long way toward reducing the potential illegal dumping problem, and helps make sure the PAYT program works for all residents, not just the “average” resident.<sup>138</sup>

**Equity- Unfair to Low Income Customers or Large Families**

Save-as-you-throw (SAYT) is a waste management pricing system where households pay based on the amount of waste they generate. While SAYT can be effective in reducing waste and increasing recycling, it can pose difficulties to low-income households and large families who generate more waste. To address this, some communities have implemented programs to make SAYT more equitable, such as offering subsidies or discounts for low-income households to offset the cost of waste disposal. An option is a hybrid system, where all residents receive base service, and any additional service is charged. This "Lifeline service" approach ensures that everyone has access to the basic waste collection services they need, while still allowing for the County to generate revenue from those who use the service more frequently. Additionally, volunteer services can be established to assist with moving carts from the residence to the curb, further increasing access to waste collection services for those who need it most.

**Figure F.2 – Mitigating Low Income / Vulnerable**

Possible Options
<ul style="list-style-type: none"> <li>• Household qualification for lower rates through the application of County program or qualify through demonstration of other qualifying program</li> <li>• Hybrid service – all residents receive base service at no fee and all additional collection is charged a fee (Lifeline service)</li> <li>• Volunteer service to assist with moving carts from the residence to the curb.</li> <li>• Qualify for non-curb collection requiring collectors to go to residence for cart collection.</li> </ul>

Concerns are often raised that SAYT programs might be unfair to large families. It is important to separate concerns about large families from concerns about low-income households. Addressing just the large family issue, consider turning the argument around. Has it been fair all these years for small disposers to be subsidizing large disposers all these years under fixed bill (or nearly fixed bill) systems?

Opportunities to reduce waste are available to all households (recycling, etc.) and those who limit their waste can get control over a bill they previously could not reduce. Although there is some relationship between family size and amount disposed, all households have opportunities to reduce. In most communities, large households do not generally receive discounts on water service, groceries, or other services that might also vary by family size. Subsidies for large families for garbage are not as easily justified as subsidies for low-income families.

<sup>138</sup> *Econservation 2015*



### **County Workload and Costs**

Of course, this answer varies from community to community, based on the specific solid waste system that the community starts with, and the changes required by the system the community implements. However, some evidence was provided by surveys conducted by two states – Iowa and Wisconsin. These states asked SAYT communities whether the workloads increased, decreased, or stayed the same after implementing SAYT. They found that roughly 55-65% said their workloads stayed the same or decreased;<sup>139</sup> and nearly two-thirds stated that costs stayed the same or decreased. And the program discourages overuse of solid waste services, so in the long run, communities should have lower costs than if solid waste behaviors had continued unabated.

### **Mitigating Non-Payment**

Mitigating non-payment in the waste collection system requires a multi-pronged approach. One effective method is to stop collection for those who fail to pay their bills, which serves as an incentive to bring their accounts up to date. Additionally, the County can pursue liens against properties of individuals who consistently fail to pay their waste collection fees. Another option is to "line-item" the tax bill for the portion of costs associated with waste collection, which is already done in the County. To further ensure system revenue, the County can also consider increasing the fixed portion of bills, and securing payments for that portion in advance. Finally, the County can choose a waste collection system with a guaranteed minimum subscription level, which assures that at least some payment will be received from all residents.

**Figure F.3 – Mitigating Non-Payment**

Possible Options
<ul style="list-style-type: none"><li>• Stop collection</li><li>• Liens against property</li><li>• "Line-item" the tax bill for portion of costs (already done in county)</li><li>• Increase the fixed portion of bills and getting secure payments for that to assure system revenues</li><li>• Select a system with guaranteed minimum subscription level that assures some payment from all</li></ul>

### **Revenue Shortfalls / Risk**

Traditionally, solid waste revenues are based on fixed bills or tax payments – fairly reliable revenue sources. SAYT programs, because they depend on customer behavior choices, will inherently lead to more volatile revenue streams than systems with fixed bills. This is very commonly a concern both for

<sup>139</sup> Wisconsin Department of Natural Resources, (2012), *Pay as You Throw (PAYT) A system for financing solid waste management*. <https://dnr.wi.gov/files/PDF/pubs/wa/wa1624.pdf>

haulers and for counties. Revenues are no longer based on a stable number like households, but rather on the number of individual cans of waste sold/disposed.

However, several strategies can help reduce the potential volatility:

- ▶ **Pick a less volatile SAYT system:** There are differences in the relative revenue volatility associated with different SAYT programs. If revenue uncertainty is a primary concern, systems with less revenue volatility include variable can or hybrid programs, or bag/tag programs that include a customer charge. In these programs, every customer is at least paying some amount every month – whether for a minimal container or customer charge – helping provide a reliable base set of funding to support the program.
- ▶ **Reduce the aggressiveness of the “rate incentives” for recycling:** If the reliable size of the difference in rates between service increments – that is, the cost of an extra can or an extra bag of garbage – is set low, then revenue variations based on number of garbage set outs will have a smaller effect on revenues. Thus, revenue variations would be low. Under this system, the “first can” rate, or the “customer charge” would tend to be higher. However, adopting a rate system with very low incremental rates for more service will 1) not provide much incentive for reducing garbage, and 2) will resemble a flat fee, so it may not be worth the administrative hassle of implementing the change! A balance between revenue volatility and incentives must be found to make the SAYT system most successful. In a detailed study (Skumatz 2001, updated 2008, 2013), the research showed that recycling impact are strong even if the difference between can fees are only 80% more for twice the service – so an incentive can be provided, but revenue risk reduced over “can is a can” pricing.<sup>140</sup>

### **Is SAYT waste disposal pricing difficult to administer?**

Anecdotal evidence from interviews with SAYT communities by the authors for SAYT manuals, indicates that in most cases, after initial efforts to educate customers about SAYT, the programs “run themselves”. However, as with most programs, there can be certain administrative challenges that need to be addressed. However, statewide surveys in Iowa and Wisconsin<sup>141</sup> found that nearly 2/3 of the SAYT communities reported no additional workload or cost from implementing the PAYT program. This indicates that: 1) SAYT programs don’t have to be expensive or troublesome to implement, and 2) the programs are flexible enough that communities can make intelligent choices that help minimize disruption from SAYT programs. Communities can reduce the administrative load by picking a program that:

- **Blends well with the current (or planned) collection system:** if customers are currently using cans, with manual collection, selecting variable can or hybrid programs may cause minimal disruptions. If bags are common, incorporate a bag, tag, or hybrid program. If you are moving toward automation, a variable can (or weight-based) program will be much more suitable than other choices.

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<sup>140</sup> *Econservation, 2015*

<sup>141</sup> *Many cities and towns around the world, including over 7,000 in the U.S., have pay-as-you-throw waste policies. Examples include Seattle, Berkeley, Austin and Portland, Maine (What is pay-as-you-throw? A waste expert explains, 2023): Seattle, Washington – 337,361 (hh) households, Berkeley, California – 44,195 (hh), Austin, Texas – 404,121 (hh) Portland, Maine – 31,237 (hh)*

### **Household Resistance / Perceiving SAYT as less service for more money**

Certainly, any change always leads to confusion and resistance to change. Getting customers to accept the change in the first place is the tricky part. Equity is a big part of the effort to “sell” the SAYT program. Public education is strongly emphasized by all communities to improve the success of the SAYT program. All systems also establish weight limits for the cans and containers, to address both safety and equity concerns.

However, the perception that the new program results in higher rates and provides less service for more money is something that some residents (and potentially the press) may latch onto. Several points are worth mentioning. First, recall that the SBC/RCF is not the crucial element. Rather, “bills” are what customers pay, and customers now have some level of control over their bills – control they did not have under fixed bill or tax-based systems. Bills are based on SBC/RCF AND customer choices about the level of service they choose to use. Those willing to recycle and reduce can now save money and lower their bills. Second, make sure they understand that the SBC/RCF provides them with multiple services – including garbage, recycling, and yard trim programs. The toughest part of the “sell” is getting customers to recognize that they aren’t paying more (on average) than they were before. SAYT can help reduce current and future solid waste management costs<sup>142</sup>; getting that message across to residents is an important part of the education program. To improve acceptance, education needs to emphasize:

- ▶▶ Why the County is making the change, and what you are trying to accomplish
- ▶▶ Options available to residents to reduce and recycle
- ▶▶ Previous SBC/RCF and new SBC/RCF
- ▶▶ How customers can work with the system to reduce their costs
- ▶▶ Special collections, programs, etc.

### **Hauler Resistance**

Haulers (large and small) across the US offer these programs. In some cases, the haulers are under contracts with municipalities; in other cases, the haulers offer the program county-wide, provide service through private contracts to households, or offer SAYT as an optional alternative to unlimited collection. In truth, haulers are very familiar with these programs. SAYT has been well publicized, and exists in thousands of communities nationwide. If concerns like revenue risk, workload, and education can be overcome, haulers basically will offer whatever households the County wants. Involving haulers in the program design, and providing a level playing field – requiring all haulers to offer the program<sup>143</sup> – will help haulers make sure the program is well-suited to county residents and their waste behaviors.

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<sup>142</sup> This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.

<sup>143</sup> This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.

### **PAYT and Automated Collection – Fully-automated or Semi-automated**

Fully Automated collection is very efficient, and can lead to significant labor and routing savings. Automated cart-based SAYT collection is common and easily accomplished, and enforcement of can subscription levels is straightforward. Some raise concerns that automated collection has two features that complicate SAYT:

- Containers: Cart-based SAYT requires specialized carts that fit the gripper arms, and small containers can slip in the arms or tip in wind, and are as expensive as large containers. Some communities are addressing this issue by allowing an option for fortnightly trash service.
- “Extras” in bags outside the specialized carts cannot be accommodated efficiently with automated collection. Extra fees keep these percentages low.

### **Methods for handling “Extra” set outs beyond sized containers**

Mitigating overflowing containers is an important aspect of effective waste management. One approach to address this issue is to implement an "Oops tag" system, where residents who have overflowing containers receive a warning tag, followed by a letter, and then potentially a fine for repeated violations. Another strategy is to record instances of overflowing containers through photos, and to charge for violations either through a separate violation bill or by adding the fine to the automatic portion of the resident's bill. It is also important to not collect waste from containers that are in violation, as this serves as a disincentive for residents to allow their containers to overflow. To help residents manage their waste, the County can also offer an extra tag system, where residents can purchase pre-paid tags for use when their containers are exceeded. This gives residents an option for disposing of their waste when their containers are full, without creating a health or safety hazard from overflowing containers.

**Figure F.4 – Mitigating Overflowing Containers**

Possible Options
<ul style="list-style-type: none"><li>• Oops tag, proceeding to letter proceeding to fine.</li><li>• Record the overflow (through photos) and charge for violations by either a separate violation bill or adding to the automatic portion of the bill</li><li>• Do not collect violators</li><li>• Offer extra tag or bag system that residents can use when can / cart is exceeded (pre-paid tag or bag)</li></ul>

The prices for “extras” (compared to regular can subscriptions) must provide a disincentive to putting out extras regularly, or collection is too disrupted.

These strategies can be coupled with a set number of “free” days or scheduled days for extra collections, with addresses recorded).

### **Contamination**

One of the key ways to mitigate contamination in waste management is by collecting all streams of waste on the same day to ensure that they are properly sorted and disposed of. To further prevent

contamination, the hauler can monitor the collection process and flag any instances of contamination they see<sup>144</sup>. In cases where contamination is identified during truck pickups, the trucks can flag the issue for the trash service to address. To hold customers accountable for their waste, penalties or fines can be imposed for improper disposal or for placing non-trash items in their carts. Feedback mechanisms, such as "Oops! Tags," can also be employed to educate customers and inform them of any contamination incidents. Finally, offering upgraded or additional recycling drop-off locations, banning single-use plastics and bags, and using trucks equipped with cameras to drive by and identify contamination can help reduce contamination and increase the effectiveness of SAYT systems.

**Figure F.5 – Mitigating Contamination**

Possible Option
<ul style="list-style-type: none"> <li>• Collect all streams on the same day</li> <li>• Hauler monitors collection for contamination</li> <li>• Trucks and drive by and flag contamination for trash service</li> <li>• Customer / Cart Penalties</li> <li>• Feedback – Oops! Tags</li> <li>• Upgraded / more drop-offs</li> <li>• Single use plastic / bag bans</li> </ul>

**Vermin**

Mitigating vermin in waste management requires a combination of preventive measures and proper waste disposal practices. It is important to place food and trash in sturdy containers using tight-fitting lids to prevent access by vermin. To further deter vermin, the use of ammonia or mothballs can be considered. When setting out the waste for collection, it is suggested to do so the morning of pickup rather than the night before to reduce the amount of time the waste is accessible to vermin. Using heavy duty trash bags or double bagging waste can also help prevent vermin from accessing the waste. Rodent repellent bags, which contain natural ingredients that repel rodents, can also be used, although reviews are mixed on the effectiveness of these bags. Motion sensor lights can be placed near waste storage areas to scare off vermin and discourage them from approaching. Damaged carts should be repaired or replaced to ensure that they provide a secure and vermin-proof storage solution. Finally, it is important to wash out food containers before placing them in the trash to reduce the appeal of the waste to vermin.

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<sup>144</sup> This Appendix is an assessment of various options considered for Montgomery County, and provides results and no program recommendations. Program recommendations for the County are listed and explained in the main body of the Implementation Plan Report.

**Figure F.6 – Mitigating Vermin**

Possible Option
<ul style="list-style-type: none"><li>• Place food and trash in containers</li><li>• Secure carts and cart lids</li><li>• Spray ammonia / use mothballs</li><li>• Set carts / bags out the morning of collection, not the night before.</li><li>• Use Rodent Repellent bags</li><li>• Motion sensor lights</li><li>• Double bag or use heavy duty trash bags</li><li>• Repair and replace damaged carts</li><li>• Wash out food containers before placing in the trash</li></ul>

**Have there been SAYT failures?**

There have been relatively few instances of cancelling SAYT programs at the community level, once it is in place. Sometimes private haulers that offer SAYT change ownership or decide for other reasons to cease offering SAYT. One noteworthy community in Maine passed and then defeated the program after it had been in for a while. The program led to a reduction in trash tonnage from 7800 tons per year to 3400 tons; however, it was viewed as punitive (not a reward), and was a divisive issue. Education was considered a driver in the program’s failure, and in some communities, the name is being changed to something more “friendly-sounding” than Save As You Throw.

## APPENDIX G: COST IMPACTS AND ANALYSIS

### Overview and Methodology

There are currently 221,209 homes in Montgomery County that are not part of an incorporated municipality such as Rockville, Gaithersburg and 17 other smaller jurisdictions. Of that number Montgomery County provides curbside trash collection service to 93,478 homes (42%). 100% of the 221,209 receive Montgomery County recycling services.

All residents purchase their own trash containers. The County has a 45-gallon size limit; however, some residents use 95-gallon carts with wheels. This type of cart is designed to be lifted by a truck lifter and is currently illegal, however the use of this type of container is allowed if the resident puts bagged trash in the cart and it can be lifted out manually.

One of the key issues to address in determining the cost savings from a SAYT program is to estimate the savings in route reduction in collection routes and the associated reduction in trucks and staffing, and the impact in changing the collection method for trash collection from unlimited setouts that is manually collected to the restriction of the trash to cart-based collections systems with semi-automated or fully automated cart collection systems.

As outlined in the section of the report describing the three scenarios for implementing a SAYT program, three scenarios were modeled for the collection of trash for Subdistrict A and B. These approaches are:

- Carts with semi-automated collection
- Bags in cans with manual collection – similar to the current program
- Carts with fully automated collection

The cost analysis is based on the estimated tonnage changes, tonnage reduction in trash collection, and tonnage increase in recyclables collection, which results from the three different SAYT scenarios:

1. Variable sized trash carts with semi-automated collection trucks
  - Additional cart for comingled recyclable containers
    - This additional recycle cart replaces the 22-gallon bin; residents will need this because of increase in recycling and change in collection to carts
2. Variable sized trash carts with automated collection trucks
  - Additional cart for container recyclables
    - This additional recycle cart replaces 22-gallon bin; will need because of increase in recycling and change in collection to carts
3. Current trash collection requiring all trash in cans with additional resident provided trash cans

There are two management approaches for trash collection in Subdistrict B: 1) The recommended contracted services like the system in Subdistrict A and 2) an ordinance-based approach where hauler requirements are defined in an ordinance under the licensing agreement. The Project Team assumed that under the contracted system requirements (or alternative under a franchise agreement), the same efficiencies that are seen in collection service in Subdistrict A would be achievable in Subdistrict B. Under the ordinance-based system, the Project Team assumed that routes would be less efficient since

specific routes that are used under a contract model are not defined, and the system operates under a more independent subscription service. The Project Team reviewed data from subscription-based collection programs and assumes an efficiency loss of 25% with the ordinance approach to service provision.

### Baseline Routes and Tons

The first step in the evaluation was to calculate the annual number of routes and tons under the various scenarios. To calculate the routes, the Project Team evaluated the route data for trash collection and recycling collection in Subdistrict A and the recycling route data in Subdistrict B. The Project Team used the recycling route data for Subdistrict B to model the trash routes for Subdistrict B. The Project Team calculated the number of annual routes for each service in each district. There are 5,980 trash and recycling routes in Subdistrict A and 9,100 routes in Subdistrict B per year. The Project Team then calculated the average tonnage collected per route by dividing the total tonnage collected in each subdistrict by the total number of annual routes.

### Baseline Tonnage Data

The following tables represent the aggressive diversion estimates under a SAYT program. The less aggressive scenario for the quantity of material that is diverted through recycling under SAYT reduces the estimated percentage from a 1.4% increase to a 1.1% increase for Commingled Materials and percentage from a 4.0% increase to a 3.0% increase for Mixed Paper/OCC collection.

**Figure G.1: Subdistrict A Tonnage**

Material	Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts	Automated Carts With lower Recycling
Generation	124,801	124,801	124,801	124,801	124,801
Trash collected	74,990	61,512	60,164	61,512	64,881
Commingled Materials	10,600	12,347	12,522	12,347	11,910
Mixed Paper, OCC	18,368	23,348	23,846	23,348	22,103
Yard Trim	19,717	20,241	20,294	20,241	20,110
Food	424	424	424	424	424
Scrap Metal	702	1,313	1,375	3,943	1,160
Bulky items	0	0	0	0	0
Ash	22,699	18,619	17,822	18,211	19,639
Source Reduction	0	5,616	6,178	6,178	4,212

**Figure G.2: Subdistrict B Tonnage**

Material	Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts	Automated Carts With lower Recycling
Generation	170,821	170,821	170,821	170,821	170,821
Trash collected	120,036	104,201	102,617	104,201	109,457
Commingled Materials	12,934	16,055	16,367	16,055	15,275
Mixed Paper, OCC	21,492	27,088	27,648	27,088	25,689
Yard Trim	15,440	15,532	15,542	15,532	15,509



Material	Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts	Automated Carts With lower Recycling
Food	424	424	424	424	424
Scrap Metal	495	603	613	1,065	576
Bulky items	0	0	0	0	0
Ash	31,288	27,160	26,748	27,040	28,530
Source Reduction	0	6,918	7,610	6,918	3,892

**Figure G.3: Subdistrict A and B Tonnage Total**

Material	Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts	Automated Carts With lower Recycling
Generation	295,622	295,622	295,622	295,622	295,622
Trash collected	195,026	165,712	161,781	165,712	174,338
Commingled Materials	23,534	28,402	28,889	28,402	27,185
Mixed Paper, OCC	39,860	50,436	51,493	50,436	47,792
Yard Trim	35,157	35,774	35,835	35,774	35,620
Food	848	848	848	848	848
Scrap Metal	1,197	1,916	1,988	1,916	1,736
Bulky items	0	0	0	0	0
Ash	53,987	45,872	45,061	45,872	48,170
Source Reduction	0	12,534	13,788	12,534	8,104

### Trash Collection

The following section describes the model assumptions and outputs for trash collection under the three modeled scenarios.

**Figure G.4: Baseline Status Quo Trash**

	Subdistrict A	Subdistrict B
Tons Per Year	74,990	120,036
Routes per Year	5,980	9,100
Average Tons Per Day per Route	12.54	13.19

### Collection Routes

The estimate of the tons per day per route is used as the basis to determine whether the reduction in the trash tons collected under each SAYT scenario will result in a reduction the required number of routes and therefore the number of trucks and staff. Based on the number of routes per day for every day of the week, the Project Team estimated the current total tons per day of trash collection for each route day. This was used to calculate the reduction in tons per route day for each SAYT scenario. Figure G.4 displays the total tons and routes per year as well as the calculated average tons per day per route for Subdistrict A. The total daily tonnage reduction was then divided by the Average Tons Per Day per Route to calculate the number of routes that would be reduced.

### Trash Collection Route and Truck Reductions

The Project Team modeled the trash collection scenarios for staff reduction and route reduction. The Project Team used the estimates for route reduction and the resulting total number of routes needed to collect the estimated trash tonnage under each SAYT scenario. The cost model incorporated the cost reduction from the truck/route reduction per day. The Project Team also assumed that for the semi-automated and fully automated routes that new trucks would need to be purchased.

**Figure G.5: Trash Collection Subdistrict A**

		Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts
Routes	Routes per Year	Tons Per Day	DAILY TONNAGE REDUCTION		
TRO1	1560	75.24	(13.52)	(14.88)	(13.52)
TRO2	1040	50.16	(9.02)	(9.92)	(9.02)
TRO3	1040	50.16	(9.02)	(9.92)	(9.02)
TRO4	1300	62.70	(11.27)	(12.40)	(11.27)
TRO5	1040	50.16	(9.02)	(9.92)	(9.02)
TOTAL	5980	288.42	(51.84)	(57.02)	(51.84)
Tons per Route		12.54	(2.25)	(2.48)	(2.25)
Truck/Route Reduction per day			(4)	(4)	(4)

As stated above the recycling route data for Subdistrict B was used to model trash collection route data. Figure G.6 displays the total tons and routes per year as well as the calculated average tons per day per route for Subdistrict B.

**Figure G.6: Trash Collection Subdistrict B**

		Status Quo	Semi Automated Carts	Bags in Cans	Automated Carts
Routes	Routes per Year	Tons Per Day	DAILY TONNAGE REDUCTION		
TRO1	2340	118.72	(15.66)	(17.23)	(15.66)
TRO2	1560	79.14	(10.44)	(11.48)	(10.44)
TRO3	1560	79.14	(10.44)	(11.48)	(10.44)
TRO4	2080	105.53	(13.92)	(15.31)	(13.92)
TRO5	1560	79.14	(10.44)	(11.48)	(10.44)
TOTAL	9100	461.68	(60.90)	(66.99)	(60.90)
Tons per Route		13.19	(1.74)	(1.91)	(1.74)
Truck/Route Reduction per day			(4)	(5)	(4)

The annualized cost of these trucks was incorporated into the costs basis using the truck costs in Figure G.7. Based on information that many of the routes have physical constraints (overhead wires or crowded street parking) that makes automated collection unfeasible, the cost model only estimated

that 20% of the routes under the automated cart scenario would be fully automated and the remaining routes would be semi-automated.

**Figure G.7: Truck Costs**

Vehicle	Cost	Annual
Automated Trucks	\$425,000	(\$69,951)
Semi-Automated Trucks	\$375,000	(\$61,721)
Rear Load	\$325,000	(\$53,492)
Interest Rate		5.0%
Period (Years)		7

**Staff Reductions**

The Project Team was provided information that the current contracted haulers in subdistrict A were staffing the trucks with three workers: a driver and two jumpers. The Project Team also reduced staffing based on the collection approach. A semi-automated cart-based collection program is typically operated with one driver and one jumper assistant. An additional staff person was therefore reduced for the remaining routes. An automated cart-based system operates with one driver. The staffing under this scenario was further reduced by an additional worker per truck.

**Figure G.8: Staff Reduction**

	Carts Semi Automated Carts	Bags in Cans	Automated Carts
Routes	DAILY STAFF REDUCTION (FTE)		
SD-A	(23)	(11)	(27)
SD-B	(35)	(17)	(42)

It was assumed that the baseline costs for currently contracted services in Subdistrict A could be achieved for contract services in Subdistrict B. Although The Project Team does not have the specific employee costs for each current contractor we used data from existing municipal contracts in the region as the basis for employee costs for drivers and jumpers. The cost savings under the three SAYT scenarios used a base cost of \$70,000 per employee and with a 28% charge for benefits and federal taxes (FICA, Medicare, FUTA, Workers Comp, Medical, Retirement) with a resulting cost of \$90,000 per employee.

The final cost Impact was the cost of providing carts for both the semi-automated and automated cart-based collection service. The SAYT program assumes that two of the three scenarios are cart-based collection programs. The framework assumes the following distribution of carts for trash collection in both Subdistrict A and B.

**Figure G.9: New Carts**

Variable size carts	Households	32 gal	65 gal	95 gal
Collection Cart Costs		\$50	\$65	\$75
Area A	93,478	54%	28%	18%
Area B under ordinance	127,731	54%	28%	18%
Area B under contract	127,731	54%	28%	18%

Cart manufacturers will often incorporate the assist communities with the distribution of new carts upon request and will build this cost in the cart cost. The Project Team assumed that the cart manufacturer would assist in the distribution of carts given that large number of carts that would be ordered and the cost per cart reflects these costs. These costs are based on recent bids, but the market is highly variable at this time so the cost could vary up to 10-15%. Alternatively, if the contract with haulers stipulates that they would assist in the distribution of carts then the cost would be borne by the hauler and spread over the term of the contract. The total cost figures at the end of this section do not include the increase in collection cost for this approach as the results suggest operating under the same contract model that is currently utilized in Subdistrict A.

**Recycling Collection**

Montgomery County has a dual stream system which requires the commingled containers and paper/cardboard to be collected separately. The recycling bins are provided and owned by the county. The County provides 22-gallon bins for commingled containers and 35 or 65-gallon carts for paper/cardboard. The 35-gallon carts are normally used by townhouses. All bins and carts are bright blue.

As with the trash routes, the estimate of the tons per day per route was used as the basis to determine whether the increase in the recycling tons collected under each SAYT scenario. Based on the number of routes per day for every day of the week, the Project Team estimated the current total tons per day of recyclables collection for each route day. This was used to calculate the increase in tons per route day for each SAYT scenario. The total daily tonnage was then divided by the Average Tons Per Day per Route to calculate the number of routes that would be required to collect the estimated tonnage of recyclables.

**Figure G.10: Recycling Collection Subdistrict A**

		Status Quo	Carts Semi Automated	Bags in Cans	Automated Carts
Routes	Routes per Year	Tons Per Day	DAILY TONNAGE INCREASE		
TRO1	1560	29.06	6.75	7.42	6.75
TRO2	1040	19.38	4.50	4.95	4.50
TRO3	1040	19.38	4.50	4.95	4.50
TRO4	1300	24.22	5.62	6.19	5.62
TRO5	1040	19.38	4.50	4.95	4.50
TOTAL	5980	111.42	25.87	28.46	25.87
Tons per Route		4.84	1.12	1.24	1.12

	Status Quo	Carts Semi Automated	Bags in Cans	Automated Carts
Truck/Route Change per day		0	0	0

**Figure G.11: Recycling Collection Subdistrict B**

	Status Quo	Carts Semi Automated	Bags in Can	Automated Carts
Routes	Routes per Year	Tons Per Day	DAILY TONNAGE INCREASE	
TRO1	2340	34.05	5.75	5.75
TRO2	1560	22.70	3.83	3.83
TRO3	1560	22.70	3.83	3.83
TRO4	2080	30.26	4.79	4.79
TRO5	1560	22.70	3.83	3.83
TOTAL	9100	132.41	22.03	22.03
Tons per Route		3.78	0.96	0.96
Truck/Route Reduction per day			0	0

The recycling route data for Subdistrict B was used to model refuse collection impacts. The current average tonnage per route in Subdistrict A is 4.84 tons or 24.2 cubic yards (a compaction rate of 400 lbs./CY). The additional tonnage would require an additional 5-7 CY of volume in a collection truck. The current average tonnage per route in Subdistrict B is 3.78 tons or 19 cubic yards. The additional tonnage would require an additional 5-6 CY. The typical curbside truck has capacities in the range of 27-35 CY. The Project Team assumed that the current collection trucks have the capacity to collect this additional material. The analysis concluded that there would not be a need for additional routes and trucks in either Subdistrict A or B.

### Carts

The only change for the recycling collection program is to switch out the 22-gallon bin for a 35-gallon cart for comingled containers. Figure G.12 displays the new carts that would be required under the cart-based recycling collection program.

**Figure G.12: New Carts**

Variable size carts	Households	35 gal
Collection Cart Costs		\$50.00
Area A	93,478	100%
Area B under ordinance	127,731	100%
Area B under contract	127,731	100%

### Staffing

The Project Team assumed the semi-automated cart-based collection could be accomplished with the same split body truck fleet that is currently used. The Project Team did not have data on the configuration of contracted service provider fleets to determine if the fleets could be modified with fully automated systems. Although there is no change in the number of routes and therefore trucks required to collect the increase recyclable tonnage, 19 new trucks in Subdistrict A and 31 new trucks in Subdistrict B are assumed to be purchased to implement a fully automated cart-based collection program.

The Project Team was provided information that the current contracted haulers in Subdistrict A and B were staffing the trucks with two workers: a driver and one jumper. A semi-automated cart-based collection program is typically operated with one driver and one jumper assistant. An automated cart-based system operates with one driver. The staffing under the fully automated system scenario was reduced by one worker per truck.

**Figure G.13: Subdistrict A and B Collection Costs**

Material	Status Quo	Semi-Automated Carts	Bags in Cans	Automated Carts	Carts With lower Recycling
Refuse & Related Administration	\$24,407,476 <sup>145</sup>	\$20,464,260	\$19,907,613	\$19,590,116	\$20,308,056
Commingled Materials	\$5,956,421	\$6,500,441	\$6,499,134	\$6,004,574	\$6,004,884
Paper	\$10,088,632	\$11,054,696	\$11,056,003	\$10,174,142	\$10,173,832

<sup>145</sup> Subdistrict A collection is \$9,385,000. \$24 million is accounting for collection in Subdistricts A and B based on the total number of households. Truck, cart, and personnel costs are reflected in Trash collection to show differences in collection types.

## Processing Impacts

The original Recycling Center building, equipped to accept and process commingled materials only, was constructed in 1991, at a cost of approximately \$9 million. The Recycling Center began processing commingled materials in August 1991. In 2002 the processing system underwent a \$2.75 Million upgrade to increase material flow and automation. The original system in 1999 was designed to process HDPE and mixed plastics containers, aluminum, steel, four grades of glass, and mixed paper. The current commodity processing list includes 12 different individual commingled commodities and mixed paper is processed onsite into mixed paper and OCC.

Approximately 80-90 tons of commingled material is processed per 8-hour shift. Mechanical and hand separation is used to sort the commingled containers which are baled for shipping. There are 76 contractors (24 Contractors and 52 Sub-contractors) working in the commingled container area. Materials are sorted during one shift per day, five days a week depending on the volume of materials received.

In May 2017, a separate paper processing area was built at a cost of approximately \$3.3 million. The paper processing operations are capable of processing 25 tons of mixed paper and cardboard (OCC) per hour. The paper processing facility is operated by nine employees. The Paper Processing Facility operations include separating and baling mixed paper and cardboard (OCC) to sell into the market. The mixed paper is baled from load bunkers and shipped on a roughly 50/50 split between commodity brokers directly to paper mills to be made into new products. The market destinations of the end users may be domestic and/or international and vary over time, depending on recycling market conditions and circumstances.

Information provided by the operational staff<sup>146</sup> at the PPF indicated that the facility cannot meet the designed throughput due to several problems with the equipment. The Paper Facility (PPF) was designed to process 25 TPH or 45,825 tons per year but is currently processing 18-22 TPH or 43,000 tons per year (260 days per year of operation) with a maximum peak capacity of 45,500 tons per year (175 tons per day) by extending operating hours, which is not sustainable.

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<sup>146</sup> Conversation with Jeffrey A. Camera, Chief, Resource Conversion Section, February 2, 2023

The Paper Facility (PPF) was designed to process 25 TPH or 45,825 tons per year but is currently processing 18-22 TPH or 43,000 tons per year (260 days per year of operation). Given the operational constraints identified at the PPF that results in a shortfall of 6-9,000 tons per year of processing capacity, the Project Team recommends incorporating an additional shift on a sixth day of the week as an alternative to building an entirely new facility to process the increase in material estimated to be collected under a SAYT program. An additional day of operations would increase the annual capacity to 51,790 tons (166 tons per day). Additional storage capacity to hold additional days of processing of baled material is also a limiting factor.

**Figure G.14 Tonnage at the PPF**

New Total Fiber Tons (maximum)	50,400
New Total Container Tons (maximum)	28,400
Annual Processed Tons	78,800
PPF Throughput Capability	
Operating Fiber Tons per Hour	20
Shifts	1.0
Prod Hr./Shift	8.3
Working Days/Year (6 days/week)	312
Potential Annual Processed Tons	51,790
CCL Throughput Capability	
Rated Container Tons per Hour	25
Shifts	1.0
Prod Hr./Shift	7.5
Working Days/Year (5 days/week)	260
Potential Annual Processed Tons	45,825

Adding an additional operating day, even given all the operational issues identified by facility management, seems the only viable option that does not increase operational hours per day beyond what is identified in labor agreements and labor law. The addition of a 6th processing day would need to be further evaluated to assess the impacts of single day labor availability, utility costs, processing speed and accuracy, as well as consistency of the volume of materials that must coincide with the 5 days per week collection routes and the viability of the tip floor storing material for an additional day of processing. If it is not feasible to extend the current operations at the PPF for an additional day or additional hours of operation, then the County should consider a new facility to process paper. If the current site does not have the available area, then an alternative location will need to be identified for a new facility. Without changes in the operational capacity of the PPF then a SAYT program would be difficult to implement.



**Figure G.15: MRF Processing Cost Service Districts A+B**

	Status Quo	Semi-Automated Carts	Bags in Cans	Automated Carts	Carts With lower Recycling Percentage
Tons	63,394	78,838	80,382	78,838	74,977
Commingled Materials	23,534	28,402	28,889	28,402	27,185
Mixed Paper, OCC	39,860	50,436	51,493	50,436	47,792
PPF Cost per Ton (Avg Per Ton with Revenue)		-\$39.75	-\$39.75	-\$39.75	-\$39.75
CCL Cost per Ton (Avg Per Ton with Revenue)		\$217.48	\$217.48	\$217.48	\$217.48
Annual Operating Cost – CCL Commingled Processing		\$6,176,861	\$6,282,733	\$6,176,861	\$5,912,182
Annual Operating Cost - Paper Processing		-\$2,004,827	-\$2,046,865	-\$2,004,827	-\$1,899,732
Waste Sorts		\$260,000	\$260,000	\$260,000	\$260,000
Total Annual Operating Cost		\$4,432,034	\$4,495,867	\$4,432,034	\$4,272,450

Material sales revenue is highly variable in today’s marketplace so using gross operating cost is the most consistent approach for determining marginal cost impacts. The Project Team used the cost per ton provided by the County to calculate the total cost for processing all recycled tons as part of the total cost of collecting and processing for recyclable materials, which presumably captures the cost decrease associated with upgrades at the current facilities.

**Education and Enforcement**

The final addition to the cost model was an increase in the per household education cost and an increase in enforcement staff to provide enforcement capability when new contracted or required trash collection programs are implemented in Subdistrict B. The enforcement staff was increased by four FTE in addition to the existing eight FTE. There may be a need for some additional enforcement in the initial 1-2 year period as the program is initiated but the pilot program will provide additional information on which to base this decision. The Project Team did not evaluate the need for additional administrative costs associated with a new trash collection service in Subdistrict B. The Project Team was given a current total cost of \$10.32 per household for current enforcement and education which was allocated evenly between education and Enforcement. The Project Team added an additional \$5.00 per household

for education and source reduction activities that would be necessary during the initial implementation years.

### Results

The calculation of the costs savings and additional costs associated with trash collection, recycling collection, recycling processing and education/enforcement were rolled into a total cost for the baseline Status Quo and each SAYT scenario. The total costs were then incorporated into the rate analysis.

**Figure G.16: Subdistrict A+B – Total Costs –New SAYT Scenarios**

Material	Status Quo	Semi-Automated Carts	Bags in Cans	Fully Automated Carts	Carts With lower Recycling
Trash	\$24,407,476 <sup>147</sup>	\$20,464,260	\$19,907,613	\$19,590,116	\$20,308,056
Commingled Materials)	\$5,956,421	\$6,500,441	\$6,499,134	\$6,004,574	\$6,004,884
Mixed Paper, OCC	\$10,088,632	\$11,054,696	\$11,056,003	\$10,174,142	\$10,173,832
Processing – All Materials	\$3,533,700	\$4,432,034	\$4,495,867	\$4,432,034	\$4,272,450
Yard Trim	\$2,124,551	\$2,161,800	\$2,165,525	\$2,161,800	\$2,152,488
Food	\$0	\$0	\$0	\$0	\$0
Scrap Metal	\$0	\$0	\$0	\$0	\$0
Bulky items	\$0	\$0	\$0	\$0	\$0
Resource Recovery Facility	\$10,359,769	\$8,802,632	\$8,646,918	\$8,802,632	\$9,260,822
Ash	\$2,778,171	\$2,355,820	\$2,313,585	\$2,355,820	\$2,478,807
Source Reduction	\$2,282,877	\$4,138,380	\$4,138,380	\$4,138,380	\$4,138,380
<b>TOTAL</b>	<b>\$61,531,597</b>	<b>\$59,910,063</b>	<b>\$59,223,026</b>	<b>\$57,659,498</b>	<b>\$58,789,719</b>

These results for the total recycling costs of \$26,046,010 differ from the total recycling costs identified in the *Solid Waste System Disposal Fund, Rate Setting Methodology FY23*<sup>148</sup>, which stated the cost for recycling in the INCREMENTAL SYSTEM BENEFIT CHARGES (ISBC) of \$46,260,938. The total for recycling calculated in our cost model was based on the recycling tonnages and cost per ton for collection and processing recyclables provided by the County.

<sup>147</sup> Subdistrict A collection is \$9,385,000. \$24 million is accounting for collection in Subdistricts A and B based on the total number of households. Truck, cart, and personnel costs are reflected in Trash collection to show differences in collection types.

<sup>148</sup> Anthony Skinner, Chief - Business Operations, Department of Environmental Protection

## APPENDIX H: EDUCATION AND OUTREACH PLAN

### Background

Education and outreach are the key to successful SAYT implementation in Montgomery County. The Waste Reduction and Recycling Section of Montgomery County's Department of Environmental Protection has been implementing innovative and progressive programs to divert materials from landfills for decades. The department is known for its quality programming and community approach to engaging residents in waste reduction and material recovery solutions.

The SAYT initiative benefits from county leadership having already bought into and supported climate solutions. In June 2021, Montgomery County adopted a Climate Action plan committing to cut greenhouse gas emissions by 2027 and 100% by 2035. This type of action signifies leadership and community support for environmental conservation programming and education. The plan includes recommendations from the Zero Waste Task Force that encourage the county to follow the Montgomery County Ten-Year Solid Waste Management Plan, which includes waste disincentive programs – like SAYT paired with larger recycling receptacles – that encourage increased recycling rates.

This outreach and engagement plan builds upon the award-winning outreach the Waste Reduction and Recycling Division already engages in and lays out how to actively engage the public before, during, and after the SAYT implementation process. When building an outreach plan, it is imperative to understand the community's demographic makeup to build inclusive and impactful plans that induce behavior change.

### County Demographics

Montgomery County considers the demographics of its population when forming policies, programs, and plans. These population demographics guide staff to identify the different needs for outreach, engagement, and education. The following demographics are summarized from the *Montgomery County Climate Action Plan* completed in June of 2021.

#### Race, Ethnicity, and Languages Spoken at Home

Montgomery County is the most populated and the most diverse county in the state of Maryland. According to the 2019 U.S. Census, 57% of the County's total population comprises people of color, (Black, Hispanic/Latino, Asian, American Indian, Alaska Native, or Native Hawaiian). Additionally, the County has a 32.3% foreign-born population, with 40% of county residents speaking a language other than English at home. The languages include Spanish, Mandarin, Hindi, Korean, Amharic, Farsi, and Vietnamese.

#### Household Income

Montgomery County is considered an affluent area. In 2019, 59% of adults over 25 years of age held a bachelor's or higher degree. The County's median household income is \$106,287, which is higher than that of Maryland as a whole. Wealth gaps exist between white households and minority households. For Black households, there is a \$50,000 wealth disparity.

## Age

The median age in 2018 was 39 years old and the county has a sizeable youth population of more than 25% of its total population.

## Home Ownership

In Montgomery County, 65.4% of residents live in owner-occupied housing. In 2017, Asian residents had the highest rate of homeownership (74.3%) in Montgomery County, followed by White (73.2%), Hispanic (49.1%), and Black (42.5%) residents. In 2018, the majority of low-income households in Montgomery County lived in multifamily homes (55%), followed by single-family detached homes (23%), single-family attached homes (17%), and small multifamily homes (5%).

## Community Insights

Climate Action Plan's Community Conversations<sup>149</sup> highlighted the need for:

- More cultural competency and diversity in government
- More equitable, respectful, and non-prejudicial community engagement, including amplification of community voices and partnerships in co-creating solutions
- Greater focus on community empowerment and helping residents live to their full potential.

It also highlighted that it's difficult for residents to care about climate change when people are living in survival mode.

## Goals and objectives

1. Communicate the most important parts of a new program coming to Montgomery County residents and other stakeholders.
2. Reduce contamination in recycling of subdistricts A and B of Montgomery County by X%<sup>150</sup> within two years of implementation.<sup>151</sup>
3. Increase paper and mixed recycling rates in subdistricts A and B of Montgomery County by X%<sup>152</sup> within two years of implementation.
4. At the completion of the pilot, the pilot SAYT program will have a positive or neutral response from a majority of the participating households. (Household survey)
5. Participants in the pilot SAYT program will understand the following (Household survey)
  - a. Why the county is piloting a new program, what it is and when the pilot will take place
  - b. That SAYT offers an incentive to choose a smaller trash cart
  - c. How to continue recycling right
  - d. How extra trash should be handled
  - e. When to set out trash and recycling carts
6. Build and obtain enough support and understanding from elected officials and decision makers to move from pilot to full implementation

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<sup>149</sup> "Highlights from Community Conversations", Montgomery County Climate Action Plan (2022).

<sup>150</sup> County sets percent goal

<sup>151</sup> An example of a community that implemented contamination and participation goals is Atlanta, GA. In 2017, Atlanta begun a multi-year outreach project with The Recycling Partnership, with a goal of reducing recycling contamination by 25 percent and increasing participation by 20 percent. The project resulted in a 31 percent decrease in contamination and a 20 percent increase in participation.

<sup>152</sup> County sets percent goal

## Stakeholder and Public Organizations

Stakeholders and other public organizations can provide valuable feedback on program design and development while also helping champion recycling efforts. Throughout each phase of SAYT implementation, the following groups will need to be engaged.

- Elected officials: Building support and understanding from elected officials is crucial as the County considers a shift to SAYT. You can find a champion among the elected officials and ensure they are armed with correct and relevant information before any meetings related to SAYT.
- Montgomery County public partners:
  - o [Maryland Recyclers Network](#) – This organization can help with ongoing education efforts and public support of SAYT.
  - o [Metropolitan Washington Council of Governments](#) - This organization can help gain public and elected official support of the program through its existing relationships and communication channels.
  - o Law Enforcement Agencies – These agencies have the power to enforce litter control law but also typically have strong social media and media reach. Partnering with these agencies on general recycling campaigns could help draw more media attention and further reach of messages on social media.
  - o [Stakeholder Database](#) – Engage those in the Aiming for Zero Waste stakeholder database as many would likely make quality ambassadors and champions of the SAYT program and help reinforce linking the program back to the larger county vision.
  - o [Former members of the Zero Waste Task Force](#) - These individuals helped create the vision for zero waste in Montgomery County. Task force members would likely make quality ambassadors and champions of the SAYT program and help reinforce linking the program back to the larger county vision.
  - o [Montgomery County Recycling Volunteer Program](#) – This is a program operated by the Waste Reduction and Recycling Section of Montgomery County’s Department of Environmental Protection.
  - o [Montgomery County Volunteer Center](#) – With tabling and outreach opportunities expanding after the pandemic, the division could continue to recruit new members through this portal to help with its recycling education efforts.
  - o [Montgomery County Public Schools \(MCPS\) Service Learning Program](#) – The division can continue to recruit school-aged volunteers through MCPS’s Student Service Learning hours. With young people making up a quarter of the population, engaging youth in recycling education and outreach can help spread the message further.
  - o [MCPS School Energy and Recycling Teams](#) – These teams of staff and students help schools foster a culture for environmental conservation. These could be good candidates for helping spread the message about SAYT and general recycling education.
  - o [Montgomery County Office of Community Partnerships](#) – This office helps strengthen connections between government and residents. The advisory groups and staff would be able to help identify groups that would be good to engage in the SAYT program as well as provide guidance on outreach activities.
  - o [Montgomery County Public Media](#) – Community media centers can partner with public service agencies to develop video and disseminate it for projects, programs, and services. The division could work with this organization to create ongoing educational and outreach content.

- o [Montgomery County Department of Transportation’s Keep Montgomery County Clean and Green Initiative](#) – This program, which is run through the County, encompasses a series of initiatives designed to maintain the County’s high-quality environment, especially in connection with the Montgomery County Department of Transportation. This group administers the Adopt-a-Road program, which encourages residents to participate in litter cleanups by adopting a specific road segment to clean on a regular basis. If increased litter is reported as the County shifts to SAYT programs, the County can be active in ensuring heavily littered areas are maintained through this program and the Adopt-a-Spot program. Additionally, KMCCG could be a good source of volunteers if they are needed for any outreach events.
- o [Solid Waste Advisory Committee](#) - These individuals helped create the vision for zero waste in Montgomery County. Members would likely make quality ambassadors and champions of the SAYT program and help reinforce linking the program back to the larger county vision.
- Local nonprofit organizations:
  - o [Montgomery County Civic Federation](#) – MCCF is a county-wide nonprofit organization umbrella group designed to promote cooperation, education, and the effectiveness of civic and community associations in the County. Membership for MCCF consists of neighborhood associations, as well as homeowner and condo associations. The issues MCCF addresses includes environmental issues, and this group could help amplify SAYT messaging.
  - o Other local civic groups that can help with messaging: [Alice Ferguson Foundation](#), Lions Clubs, Sierra Clubs, Kiwanis Clubs, neighborhood associations, community alliances
- Contracted waste haulers: The main haulers servicing Montgomery County are Unity Disposal and Recycling (servicing 77% of Subdistrict A homes for both trash and recycling), Republic (providing trash and recycling services for some home in Subdistrict A), Ecology Services Refuse and Recycling (servicing 90% of the homes in Subdistrict B for recycling), and GFL and J&J Inc. hauling the majority of trash from Subdistrict B (not via county contract). Waste haulers play a vital role in SAYT implementation, and it is important for Montgomery County to maintain a strong relationship with this group of stakeholders. Waste haulers will need a clear understanding of what is expected of them and when.
- Montgomery County residents: Montgomery County residents and customers are key to reducing trash and increasing recycling through SAYT. Their input is crucial to creating long-term behavior change, while also ensuring equity and fairness in the system.
- Maryland Environmental Services (MES): MES operates the CCL and PPF for Montgomery County. As the entity processing and marketing Montgomery County’s recyclable material, maintaining a feedback loop with MES is important, as SAYT has an impact on recycling tonnage and on the facilities.

## APPENDIX I: MEMO COMBINED SBC AND RCF CALCULATIONS FOR MONTGOMERY COUNTY SAYT



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**DATE:** 06/23/2023

**TO:** Marilu Enciso & Anthony Skinner, Montgomery County

**FROM:** Lisa Skumatz & Ann Gibbs, SERA

**SUBJECT:** Combined SBC and RCF Calculations for Montgomery County SAYT

### ABSTRACT

1. Updated SBC<sup>153</sup> revising inputs to include revenue charges in collection and processing for trash and recycling.
2. Calculated Refuse Collection Fund by starting with existing value and decreasing by the project-estimated percent decrease in refuse collection costs in Subdistricts A&B from efficiencies due to broader and updated contracting.
3. Added SBC and RCF together and re-ran rate calculations.

### CALCULATION OF SYSTEM BENEFIT CHARGE (SBC)

Base System Costs – No Changes

Base System Benefit Charges:

- The single family residential sector will see a decrease in total generation due to source reduction. This reduces the County's Total generation. The current Single Family proportion of total County generation is 39.7%. With SAYT, the new Single Family proportion will be reduced to 37.6%.
- Offsets from Refuse Disposal Fees Tipping Fees will decrease from a reduction trash. The new Base System Charges is a conservative value.

Incremental System Benefit Charges (ISBC)

- Recycling costs will increase with increased tons to process. Updated calculations of the, 1) annualized cost of recycling collection (trucks and staff) using industry standard collection efficiencies and services of recycling trucks and, 2) carts costs have been performed. One result is recycling truck personnel costs will decrease. Values have been calculated with revenues

<sup>153</sup> Calculations for SBC from Solid Waste System Disposal Fund, Rate Setting Methodology FY23.

included per FY21 Annual Average Unit Cost-SECTION I – Results & Methodology 2-18-2022. (Figure 3)

- Satellite Sites – No change
- Organics – Food Waste – No change
- Stabilization – No change
- Composting yard trim will slightly increase with a small increase in yard trim tonnage.

**Disposal Charge**

- Reduction in tons of refuse disposed by single family homes due to increased diversion and source reduction.

**Total SBC**

- Added the above together, the new total for the SBC is \$307 per household compared to the non SAYT value from Solid Waste System Disposal Fund, Rate Setting Methodology FY23 of \$288.

**CALCULATION OF REFUSE COLLECTION FUND (RCF)**

- RCF covers the omitted trash collection costs from previous calculations.
- Figure 2 calculates the annual per household dollar (-\$21.78) and percent reduction (17%) in trash collection costs (excluding tonnage related changes).
- The new RCF equals the current RCF minus the project-estimated 17% reduction in refuse collection costs (\$105.22)

**TOTAL CHANGE IN SBC AND RCF DUE TO SAYT**

- Bottom line of Figure 1 shows the total of SBC and RCF. Current FY23 is \$415 per household per year. New charge with SAYT is \$413 per year with a net savings of -\$1.99 per household per year.

Figure 1: Current and New Charges per Household with SAYT

	Current Charge per Household	New cost per Household with SAYT	Incremental (new-current)
Disposal Charge	\$49.16	\$44.95	\$(4.21)
Base SBC	\$40.15	\$42.16	\$(2.01)
Incremental SBC	\$198.89	\$220.87	\$21.98
Total Fee Disposal	\$288.2	\$307.98	\$19.78
Refuse Collection Fund	\$127	\$105.22	\$(21.78)
Total All Fees	\$415.2	\$413.21	\$(1.99)



Figure 2: New Refuse Collection Fund with SAYT (Annual)

	Subdistrict A	Subdistrict B	Countywide (A&B)
Truck Costs (total)	\$1,329,000	\$1,913,000	\$3,242,000
Personnel Savings (total)	-\$2,529,000	-\$3,935,000*	-\$6,464,000
Cart Costs (total)	\$653,000	\$178,000	\$831,000
Total Change	-\$1,672,000	-\$3,145,000	-\$4,817,000
Households (2021)			221,209
<b>Change per Household</b>			<b>-21.78</b>
Current RCF FY23 per HH			\$127
<b>New RCF with SAYT per HH</b>			<b>\$105.22</b>
Percent Reduction in RCF			17%

Table Note: \* Trash service is not currently provided by the County in Subdistrict B. Personnel costs were estimated using industry standard collection efficiencies (households/hour) and typical staffing assuming collection is 20% fully automated and 80% semi-automated across the County.

Figure 3: Cost per ton for Collection and Processing

Facility/Material	Current Cost per Ton (\$/ton) <sup>154</sup>	County Wide (A&B) Current Total	County Wide (A&B) New Total
Refuse Collection & Related Administration	\$125.15	\$24,407,000 <sup>155</sup>	\$24,407,000 <sup>156</sup>
Commingle Materials & Paper Collection	\$253.10	\$16,045,000	\$16,179,000 <sup>157</sup>
Processing – Fiber and Commingle Combined	Paper: -\$39.75 Commingle: \$217.48	\$3,534,000	\$4,432,000
Dickerson Compost Facility & Related Yard Trim Waste Grinding	\$60.43	\$2,125,000	\$2,161,800
Scrap Metal	\$0	\$0	\$0
Resource Recovery Facility & Related Waste Transfer	\$53.12	\$10,360,000	\$8,803,000
Out-Of-County Rail Hauling of Ash	\$51.46	\$2,778,000	\$2,356,000
Recycling Outreach, Education, Enforcement, and Waste Reduction	\$10.32	\$2,283,000	\$4,138,000

<sup>154</sup> Costs per ton include revenue. Values were provided by the County in FY21 Annual Average Unit Cost-SECTION I – Results & Methodology 2-18-2022. This column was changed based on comments from Anthony 3/3/2023 & 6/13/2023.

<sup>155</sup> Subdistrict A collection is \$9,385,000. \$24 million is accounting for collection in Subdistricts A and B based on the total number of households.

<sup>156</sup> Truck, cart, and personnel costs are reflected in the RCF per comments from Anthony Skinner in DraftFinal received on 06/05/2023 and email on 06/16/2023.

<sup>157</sup> Increase in collection is due to truck, cart, and personnel costs.

## APPENDIX J: OTHER BILLING OPTIONS

The executive summary included a review of best practices for a successful SAYT system. These included:

- **Multiple trash service levels, including a small option:** The designed system meets this goal, incorporating options for 32-, 64- 96- and multiple 96-gallon trash service levels.
- **Convenient recycling and diversion options and minimal diversion barriers:** Montgomery County’s recycling and yard trim programs were already strong, well-known / advertised, and well-used. The program improves that situation by introducing a larger recycling container to allow the extra diversion volume expected from SAYT, provided by the County. In addition, the programs are available at no separate fee, further reducing barriers to their universal use.
- **Effective, supporting outreach:** Montgomery County’s outreach is already very strong, and the Implementation Plan provides additional recommendations related specifically to SAYT messaging, and the specialized outreach procedures needed to support the cart selection process and the bill-related messaging.
- **Enforcement:** The County already has a variety of enforcement mechanisms on the books, and the Implementation Plan includes recommendation’s for additional enforcement and procedures that further support the pay-more-for-more-trash-service core message. These include reduced “free” trash-related services, responsibilities related to contamination, and other enforcement to reinforce the SAYT principle.

The last element of best practices is **Providing meaningful rate differentials**, addressed in this section. Ideally, the price signal for different trash collection levels needs to be significant and meaningful enough to incentivize changes in household waste management behavior.

Billing for PAYT in most communities or counties is conducted via periodic bills, either as a separate trash / solid waste bill, or a combined utility bill with utility services like electricity or water. These bills are issued by the entity themselves, or contracted to an outside billing service, or, less commonly, provided as part of the services required by contracted haulers. These bills are usually provided monthly, every other month, or sometimes quarterly. This system has the following advantages:

- Providing regular, visible feedback reminders that smaller trash service levels can save money.
- They allow for targeted and regular supporting messaging.
- Billing in combination with other utilities allows bill-payment enforcement via potential water shut-off.
- Billing frequently allows flexibility in billing, making the system more friendly toward adjusting billed amounts for changes in cart sizes, invoicing for “bulky”, extras, or overflows<sup>158</sup>.
- Reaches residents of the home (the waste *generators*), not only property owners.
- Allows easier implementation of low-income qualification and special rates, associating them with the resident, rather than only to low-income property owners.

For multiple reasons, Montgomery County’s finance department expressed a strong preference for considering an adaptation of the existing annual tax-bill-based charges – specifically using the System

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<sup>158</sup> Usually transferred directly to the billing processing center / database using photos and data transfer from in-truck software

Benefit Charge (SBC) plus the Refuse Collection Fund (RCF). Considerations associated with this system are provided below.

- Strong assurance of payment through the existing enforcement and property lien system, minimizing financial risk.
- Existing system can be adapted relatively easily to recover costs of the system and incorporate a dollar incentive. However, the dollar incentive is likely to be perceived as a small part of a larger tax bill and may be less motivating than an independent bill.
- Low costs to bill, as it is tacked onto an existing, once-annual bill; but is inflexible for changes that occur *within* the year (cart switches, overflows, etc.).
- Combined once-per-year billing makes reinforcing messaging for recycling difficult.
- Reaches property *owners*; this complicates providing signals to occupants / waste generators.<sup>159</sup>
- Reaching property *owners* complicates providing low-income rates to low-income *occupants/generators*.

Meaningful rate differentials implies that customers see and understand the signal, as well as providing a significant, noticeable, and behavior-incentivizing rate signal. The tax-based billing system allows rate signals, but the muted size when compared to an entire tax bill, and the fact the bill goes to owners, not occupants, mitigates the “meaningful” element of the best practices for PAYT rates somewhat.<sup>160</sup> The remainder of this section describes the methods by which the SAYT system can be administered using the existing tax-based billing system.

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<sup>159</sup> An unintended side effect of this selection by property owners is that they will have a cost incentive to select a smaller (cheaper) trash container for use by their renters. The system already expects most households will be able to use 32-gallon containers, but this may bias selection of 32-gallon containers even more. This may also encourage renters to recycle more. However, the County will want to have a fairly aggressive monitoring program early-on to make sure tax-paying owners haven't undersized service levels for their occupants.

<sup>160</sup> Toronto Ontario is an example of a community that bills annually for PAYT through the tax system. The City also has a solid waste charge that is billed with water approximately every three months.

**APPENDIX K: TRACKING AND METRICS**

See PDF attachment Appendix K Tracking and Metrics.



**APPENDIX L: IMPLEMENTATION TIMELINE**

See PDF attachment Appendix L Implementation Timeline.

