PUBLIC WORKS COMMITTEE REPORT to the BOARD OF SUPERVISORS
Tuesday, January 28, 2020
8:00 a.m.
107 NORTH KENT STREET, SUITE 200, WINCHESTER, VIRGINIA

PUBLIC WORKS COMMITTEE ATTENDEES:

Committee Members Present: J. Douglas McCarthy, Chairman; Robert W. Wells; Gene E. Fisher; and Harvey E. "Ed" Strawsnyder, Jr.

Committee Members Absent: Whitney "Whit" L. Wagner

Staff and others present: Joe C. Wilder, Director of Public Works; Kris Tierney, County Administrator; Gloria Puffinburger, Solid Waste Manager; Ron Kimble, Landfill Manager; Mike Stewart, Senior Project Manager; Erin Swisshelm, Assistant County Attorney

Attachment 1 – Agenda Packet

ITEM FOR INFORMATION ONLY

1-Update on Public Works projects.

Staff updated the committee on several on-going projects. The Crossover Boulevard Road Project is on-going with steel beams being placed this week and into next week for the new bridge over I-81. The project is currently ahead of schedule.

The new Frederick County Animal Shelter Training Facility, which will be solely funded by donated funds, is currently out for bid. Bids are due on February 19, 2020. Once the bids are received, staff will come back to the committee to request the donated funds be transferred to begin construction.

2-Update on Sunnyside Plaza and the county office building space needs study.

Currently, our on-call architect, OWPR, Inc. is performing an update on the county space needs requirements. They are also performing an as-built of the existing building at Sunnyside Plaza and Marsh & Legge Land Surveyors is performing as-builts of the site and utilities. We anticipate discussing our findings at the February 25, 2020 Public Works Committee Meeting.

3-Update on the relocation of the Albin Convenience Center.

We anticipate beginning construction of the new site in February. We met with school officials recently in an effort to coordinate traffic control during construction. The project is fully funded, and we anticipate completion by early summer 2020.

4-Transfer request for the Frederick County Landfill into Professional Services.

Due to on-going projects at the Frederick County Regional Landfill, we requested a supplemental appropriation in the amount of $600,000.00 from the landfill unreserved fund

balance into the Professional Services line item 12-4204-3002-00. Multiple project designs and studies are on-going to evaluate several possible projects at the landfill.

A motion was made by Supervisor Wells recommending approval of the request and to forward the request to the Finance Committee for further consideration. The motion was seconded by Supervisor Fisher. The motion was unanimously approved by the committee and has been forwarded to the Finance Committee.

5-Update on holiday usage at the citizen convenience centers.

Staff gave an update on recent tonnage from the holiday season. We saw an increase in tonnage of 24% over 2018.

6-Discuss the recycling study performed by SCS Engineers.

Due to continual uncertainty in recycling collections and markets for Frederick County and the region, we had our on-call consultant, SCS Engineers perform a study of current options related to recycling. The report focused on the option of utilizing the Frederick County Regional Landfill as a location for a Materials Recovery Facility (MRF)/recycling collection center. Also, part of the study evaluated the costs for our current recycling contract with Apple Valley Waste in Hagerstown, Maryland. The study was performed by Stacey Demers, Project Director with SCS Engineers. She worked with Gloria Puffinburger, Solid Waste Manager as well to ensure she got all available data, tonnages, costs and updated information on our contracts.

In summary of the report, the option to construction a MRF at the landfill would be too costly. Our current option of hauling recycled materials to Apple Valley Waste is our most economical option for now. Another possible option that was studied to help cut costs would be for a private company to open a MRF locally to receive recycled goods. One local company is attempting to move forward with starting a MRF in our area. We will have to see if that option materializes.

Currently, increased hauling costs have led to increased budgetary costs for getting the recycled goods to Hagerstown, Maryland. Staff continues to monitor costs and all available options but there is not any local MRF's so hauling materials to Hagerstown is our only real option, at this time. Discussion during the meeting highlighted that this is not just a local problem, but nationwide.

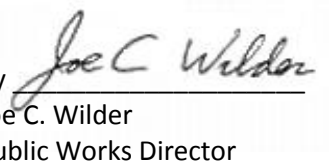
As we determine what our future options are, Frederick County is required to meet Virginias mandated 25% recycling rate. Any options that would eliminate or curtail recycling efforts in the county would impact the county's ability to reach that mandate. SCS Engineers is also working on the larger Northern Shenandoah Valley Regional Commission (NSVRC) recycling study that includes all of our local counties. We anticipate that study to be completed by early March 2020. Once that study is complete, we will update the committee with those results and determine what our next steps will be.

Respectfully submitted,

Public Works Committee

J. Douglas McCarthy, Chairman

Robert W. Wells
Whitney “Whit” L. Wagner
Gene E. Fisher
Harvey E. “Ed” Strawsnyder, Jr.

By 
Joe C. Wilder
Public Works Director

JCW/kco

Attachments: as stated

cc: Kris Tierney, County Administrator
Jay Tibbs, Deputy County Administrator
Ron Kimble, Landfill Manager
Gloria Puffinburger, Solid Waste Manager
Rod Williams, County Attorney
Erin Swisshelm, Assistant County Attorney
file

Attachment 1

COUNTY of FREDERICK
Department of Public Works
540/665-5643
FAX: 540/678-0682

MEMORANDUM

TO: Public Works Committee

FROM: Joe C. Wilder, Director of Public Works JCW

SUBJECT: Meeting of January 28, 2020

DATE: January 22, 2020

There will be a meeting of the Public Works Committee on Tuesday, January 28, 2020 at 8:00 a.m. **in the conference room located on the second floor of the north end of the County Administration Building at 107 North Kent Street, Suite 200.** The agenda thus far is as follows:

1. Update on Public Works projects – Crossover Boulevard/Frederick County Animal Shelter.

2. Update on Sunnyside Plaza and the space needs study.

3. Update on the relocation of the Albin Convenience Center construction.

4. Discuss transfer request for the Frederick County Landfill – Professional Services. **(Attachment 1)**

5. Update on holiday usage at the citizens convenience sites. **(Attachment 2)**

6. Discuss the recycling study by SCS Engineers. **(Attachment 3)**

7. Next schedule Public Works Committee Meeting will be February 25, 2020.

8. Miscellaneous Reports and Documents:

   a. Tonnage Report: Landfill

(Attachment 4)

b. Recycling Report
(**Attachment 5)**

c. Animal Shelter Dog Report:
(Attachment 6)

d. Animal Shelter Cat Report
(Attachment 7)

JCW/kco

Attachments: as stated

COUNTY of FREDERICK

Department of Public Works
540/665-5643
FAX: 540/678-0682

MEMORANDUM

TO: **Public Works Committee**

FROM: **Ron Kimble, Landfill Manager** RK

THROUGH: **Joe C. Wilder, Director of Public Works** JCW

SUBJECT: **Transfer from Landfill Retained Earnings**

DATE: **January 20, 2020**

I would like to request a of transfer $600,000 from the landfill's retained earnings account, 12-100-1010 into expenditure line item 12-4204-3002-000. This request is necessary to cover professional services expenses that were not included when the FY 19/20 budget was developed. Tasks associated with these expenses include a regional recycling study, a pilot composting study, a DEQ required work plan related to leachate flows from permit 40 and a study to evaluate reclamation of permit 40 and expansion of permit 529. These tasks are expected to require approximately $550,000. The remaining requested funds will be used to cover other tasks such as additional surveying needs.

COUNTY of FREDERICK
Department of Public Works
540/665-5643
FAX: 540/678-0682

MEMORANDUM

TO: Public Works Committee

FROM: Gloria M. Puffinburger
Solid Waste Manager

RE: 2019 Holiday Usage Summary;
Citizens' Convenience Sites

DATE: January 21, 2020

During the 2019 Christmas holiday period which included Christmas Eve through Sunday, December 29, staff conducted traffic counts at the county's two busiest convenience sites, Albin and Greenwood. A total of 2,034 vehicles visited the Greenwood citizens' convenience site and 2,516 utilized the Albin location.

As expected, traffic spiked during the period, peaking at 913 at Albin and 659 at Greenwood on Thurs., December 26, the day after Christmas and traditionally the busiest trash day of the year. Traffic totals are up slightly from 2018 figures. Heavier than normal trash flow continued through the post New Year weekend. The Albin site took in nearly 52 tons of holiday refuse while Greenwood managed 60 tons.

Overall, the county's ten convenience sites accepted 402.3 tons of refuse attributable to the holiday season which includes Christmas and New Year's Eve. This number represents an increase in tonnage of 24 percent over 2018.

/gmp

cc: file

Recycling Program Options Assessment

Frederick County, Virginia
Public Works Department
107 N. Kent Street
Winchester, VA 22601

SCS ENGINEERS

02197017.24 – Task 15 | January 21, 2020

11260 Roger Bacon Drive
Reston, VA 20190
703-471-6150

Table of Contents

Exhibits

Tables

Appendices

1 EXECUTIVE SUMMARY

Frederick County (County) requires a new sustainable long-term recycling solution. The County's long-time recyclable material processer, Southern Scrap, announced in the summer of 2019 that it will close at the end of 2019. Southern Scrap's decision to close is not entirely unexpected. Recycling processors across the U.S. have been scrambling to find markets for recyclable materials since January 2018, when China implemented their Operation National Sword. These policies have banned the import of certain types of scrap materials and implemented much stricter and more rigorous contamination standards for materials accepted. As a result, there is an over-saturation of the domestic recycling market as materials that had been previously sent to China are now being marketed domestically. This has led to depressed pricing for recycled commodities. Across the country, local governments who had become accustomed to receiving rebates on their recyclable materials are now paying higher fees to continue their recycling programs.

Since Southern Scrap's announcement to close, the County has been searching for new facilities that will accept the recyclable materials collected through the County's convenience center program. As a result, the County has issued three Invitations to Bid (IFBs) for recycling processing and hauling. The closest recycling processing facility that accepts all commodities collected at the County's convenience centers, Apple Valley Waste, is located in Hagerstown, MD about 50 miles from the convenience centers in the County. Hauling all recyclable materials to a local market is $120 per ton but hauling all recyclable materials to Apple Valley Waste will be $201 per ton, an increase of $81 per ton. The County's current plans are to haul recyclable material collected at its convenience to Apple Valley Waste for just over $312,000 annually or $221 per ton ($201 for transportation and $20 for tipping fees).

The cost to transport recyclable materials to Hagerstown for processing is creating a significant financial burden on the County which threatens the viability of the recycling program. The County commissioned this recycling assessment study to identify recycling options that will help control program costs while still serving the needs of Frederick County residents. SCS identified the following three options as paths forward for the County's recycling program.

Option #1 – Transport all Recyclable Materials to Apple Valley Waste (Status Quo)

After a competitive bid process, the County opted to have their recyclable materials (1,410 tons annually) collected and transported by Republic Services to Apple Valley Waste in Hagerstown, Maryland for processing and marketing. Annual costs for this option are just over $312,000 or $221 per ton ($201/ton for transportation and $20 in tipping fees)

Option #2 – Develop Local Aggregation and Baling Facility

SCS estimated three options for a County-owned aggregation and baling facility, varying by quantity of incoming recyclables and program:

- **Frederick County recyclables only.** A facility to process only the recyclables from the County's convenience centers would need to be 13,750 square feet to store and bale 1,410 tons of recyclables annually. This facility would cost between $3.0M and $4.2M, resulting in a unit cost of $261 to $365 per ton.

- **Frederick County, Clarke County, and City of Winchester recyclables.** A facility to process the recyclables from convenience centers in Frederick and Clarke counties and the curbside collection from the City of Winchester residents (assumes separation by material type) would need to be 18,000 square feet to store and bale 3,535 tons of

material annually. This facility would cost between $3.6M and $5.0M resulting in a unit cost of $123 to $173 per ton.

- **Frederick County, Clarke County, City of Winchester and privately-collected commercial sector recyclables.** A facility to process the recyclables from convenience centers in Frederick and Clarke counties and the curbside collection from the City of Winchester residents (assumes separation by material type) and the privately-collected commercial sector cardboard would need to be 27,000 square feet to store and bale 8,425 tons of material annually. This facility would cost between $4.9M and $6.9M resulting in a unit cost of $71 to $99 per ton.

  If the facility was constructed to be 27,000 square feet but only received half of the annual recyclables generated from the City of Winchester and the privately-collected commercial sector, the unit cost would increase to $132 to $184 per ton

Option #3 – Utilize a Local Privately-Owned Facility

With the closing of Southern Scrap, there are no existing recycling processing facilities in the County. This also presents issues to the commercial sector who relies on private haulers for collecting their cardboard and transporting it to a recycling facility. Private haulers had also relied on Southern Scrap for accepting cardboard. It is estimated that almost 5,000 tons of cardboard are collected annually from the commercial sector in the County. As such, private haulers are considering investments in an aggregation and baling facility for the material they haul from the commercial sector.

It is estimated that the County's cost to transport recyclables from their convenience centers to a local facility is about $170,000 annually or $120 per ton. The tipping fees at Apple Valley Waste in Hagerstown, Maryland vary between $0 for cardboard to $60 per ton for plastic bottles, with a weighted average of $20 per ton for all recyclable commodities. It is expected that a local commercial baling facility could process the County's recyclables for about the same. The recycling program in nearby Page County, Virginia bales its recyclable materials and is therefore able to attract a recycling processing facility to collect their baled materials at no cost to the County. It is assumed that a local privately-owned baling facility could also receive the same benefit. However, it is conservatively estimated that a local facility could accept the County's recyclable materials for between $20 to $80 per ton to accommodate additional transportation to markets if needed. A private facility would also help Clarke County and the City of Winchester reduce their recycling program costs.

Exhibit 1 presents the recycling program unit costs ($/ton) for the options described above. The costs presented include transportation, processing and/or amortization of capital costs. The current recycling program unit cost is displayed by the red diamond; the unit cost ranges for a program that includes a county-owned baling facility are presented by the blue bars (four options for facility sizing based on throughput); and the green bar presents the unit cost range for utilizing a privately-owned facility.

It should be noted that a privately-owned facility does not currently exist; however, this option is presented for comparison purposes.

Exhibit 1. Unit Cost Ranges for Recycling Program Options

2 BACKGROUND

The County owns and operates 11 convenience centers for residents to dispose of household refuse and segregated recyclable materials. The County strives to staff each convenience center with an attendant to assist residents in placing materials, whether trash or recyclables, in the correct collection container. Republic Services has been contracted to haul individual containers of mixed paper, cardboard, plastic containers and metal cans (steel and aluminum cans) to Southern Scrap in Winchester for processing and marketing; however, Southern Scrap informed the County that it will cease operations in December 2019 and terminate its contract to accept the County's recyclable materials.

Southern Scrap's decision to close is not entirely unexpected. Recycling processors across the U.S. have been scrambling to find markets for recyclable materials since January 2018, when China implemented their Operation National Sword. These policies have banned the import of certain types of scrap materials and implemented much stricter and more rigorous contamination standards for materials accepted. As a result, there is an over-saturation of the domestic recycling market as materials that had been previously sent to China are now being marketed domestically. This has led to depressed pricing for recycled commodities. Recycling processors have responded in a number of ways to these challenges. Some have limited or rejected the types and/or quantities of material they accept. Others have invested in additional processing equipment (at additional cost) to remove contaminants from recyclable materials. Still others have stockpiled recyclable material in the hopes that the markets improve or are scrambling to find new markets for their material. This means higher fees to local governments who had become accustomed to receiving rebates on their recyclable materials.

In surveys across the U.S., most residents still support recycling programs even if they have to pay more to continue the service. Larger communities are investing in education and other outreach efforts to reduce contamination and improving operational efficiencies to reduce the impact of higher recycling costs. Smaller communities are trying to do the same but do not have the same flexibility to maintain their programs. Due to its rural nature, Frederick County has limited access and proximity to recycling processors and markets. However, the use of convenience center attendants, collection methods that keep recyclable material types separated, and exclusion of glass result in a low level of contamination. This makes the County's recyclable materials more attractive to recycling processors.

To continue the recycling program, the County needs to assess their options to either reduce transportation and processing costs to recycling processing facilities outside the County or develop processing capacity within the County.

3 CURRENT PROGRAM

In fiscal year 2019, Frederick County collected and diverted over six million pounds of materials through their recycling programs: about half of this quantity was comprised of plastic bottles, metal cans, mixed paper and cardboard that was delivered to Southern Scrap for processing and marketing; the remaining half was comprised of textiles, electronics, and scrap metals that were delivered to other local markets. There has been a consistent moderate growth in the quantity of material diverted from landfill disposal for the past four years.

The County calculates a recycling rate of 53.9 percent which far exceeds the state mandate of recycling 25 percent of waste produced. In fiscal year 2019, the County's recycling program received about $42,000 in rebates from the sale of recyclable material; although this was significantly less than the rebates the County received in fiscal year 2018 due to the depressed recycling market. Because the County staffs each of its convenience centers with attendants that assist residents place correct material in the recycling collection containers, their materials have a low level of contamination (below five percent by weight). This clean stream of recyclable materials positions the County well for finding facilities that will accept their recyclable materials and receiving the highest rebates for their materials.

CONVENIENCE CENTERS

Overview

The County operates 11 convenience sites throughout the County. Sites are open to residents of Frederick County, Clarke County, and the City of Winchester to use for the disposal of trash and recyclable materials at no charge. Most convenience sites are open six days a week (closed Wednesdays) to provide County residents a high level of service. The County staffs each site to monitor usage and occasionally relies on outside groups such as United Way to supply volunteers to help enforce recyclable material preparation guidelines.

Usage

Resident usage of the convenience centers varies significantly from one site to another. In 2019, the County reports that annual usage ranged from about 600 vehicle trips (Star Tannery) to over 15,000 (Albin). Not surprisingly, convenience centers located closer to urban areas (Albin and Greenwood) received more vehicle trips per day on average. Overall, daily vehicle trips for The Albin site in particular received a 17 percent increase in vehicle trips from 2018 to 2019. Four sites (Back Creek, Round Hill, Gore, and Star Tannery) receive on average less than 150 vehicle trips each day. Exhibit 2 provides of map of Frederick County with designated markers to indicate the location of the convenience centers. Convenience centers with lower daily usage tend to be located in the more rural western part of the County.

Overall, the number of vehicle trips taken to the convenience centers decreased by about one percent in 2019 from 2018, from 911,916 vehicle trips to 902,976. Table 1 lists the average daily vehicle trips for each convenience center for 2018 and 2019 and calculates how usage of the individual sites has changed over the last year.

Exhibit 2. Citizen Convenience Centers in Frederick County

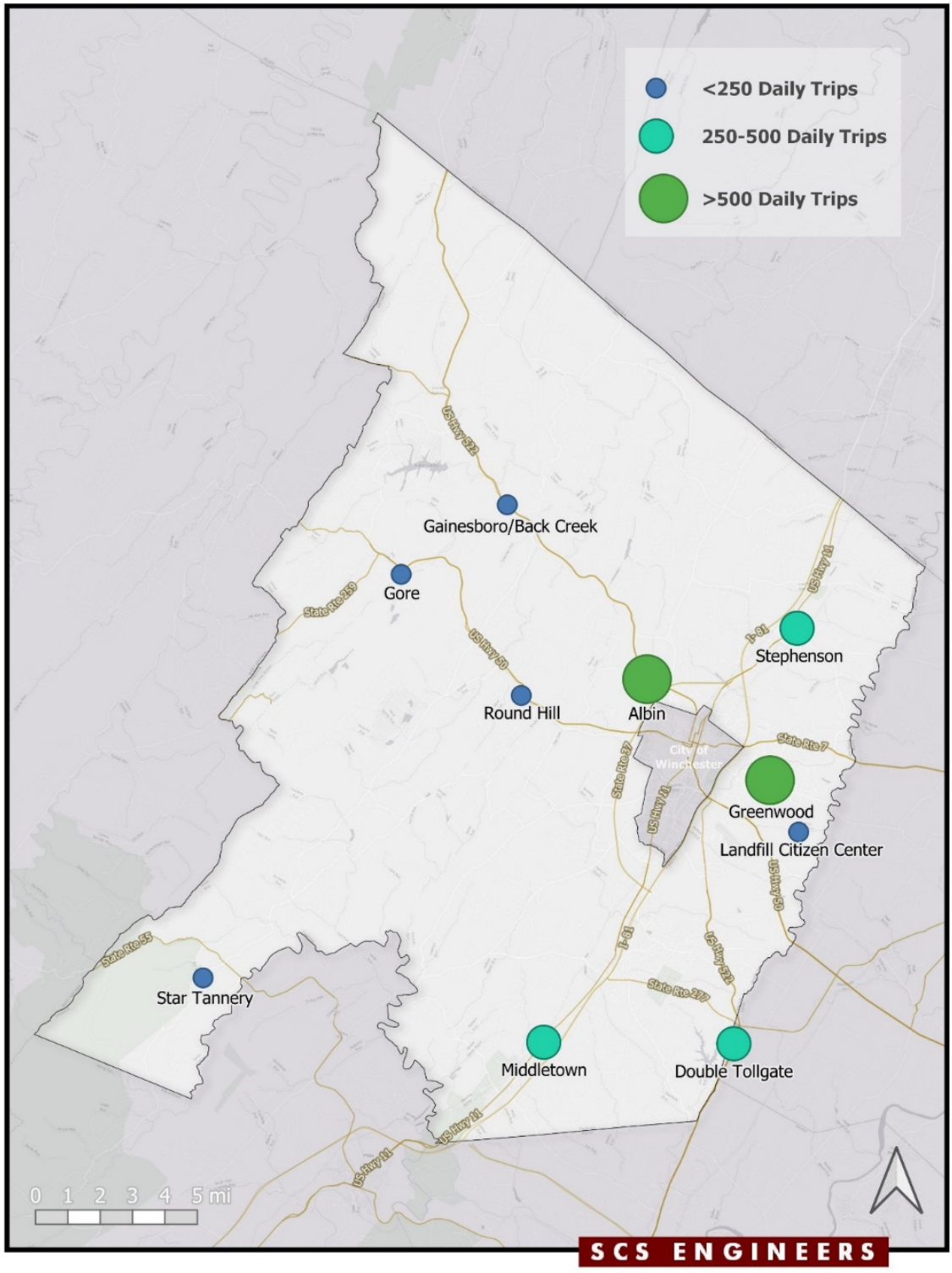


Table 1. Average Daily Vehicle Trips by Convenience Center

Convenience Center	2018 Vehicle Trips	2019 Vehicle Trips	Percent Change
Greenwood	14.222	13,459	-5.2%
Albin	13,286	15,552	17.1%
Middletown	7,091	7,170	1.1%
Stephenson	9,598	10,727	11.8%
Double Tollgate	7,950	7,793	-2.0%
Shawneeland	6,577	6,771	2.9%
Gainesboro/Back Creek	4,987	5,162	3.5%
Round Hill	4,257	4,409	3.6%
Gore	3,361	3,544	5.4%
Star Tannery	654	661	1.1%

Materials

Recyclable materials collected through Frederick County's convenience center program are collected source-separated. All convenience centers are equipped with either 30-yard roll-off containers or 8-yard dumpsters for the placement of recyclable materials. Residents are required to separate recyclable materials from trash and by material type (cardboard, mixed paper, plastic bottles, and metal cans) when they use the convenience centers. **Table 2** lists the materials that are accepted as part of the County's recycling program.

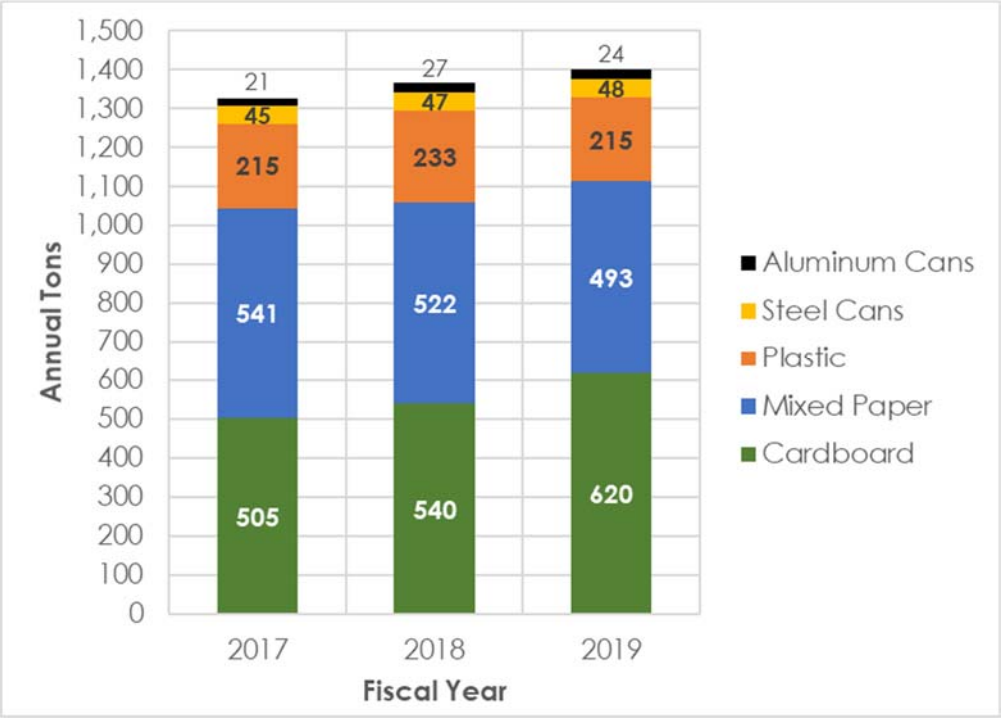
Table 2. Materials Accepted for Recycling at County Convenience Centers

Material	Examples	Special Instructions
Paper	Inserts, magazines, catalogues, office paper, shredded paper, phone books	Must be dry and may be contained in a paper bag
Cardboard	Corrugated boxes, paperboard	No pizza boxes or coated/waxed materials
Metal Cans	Aluminum/ steel food and beverage cans	Empty, dry, and clean
Plastic	Bottles and containers that have a neck (typically #1 PET and #2 HDPE)	Clean, empty and dry; lids are not accepted; no plastic bags

Material Quantities

SCS reviewed Frederick County records for the amount of recyclable materials collected through the convenience center program. Cardboard and mixed paper comprise the largest portion of the recyclable material stream. These materials comprise about 80 percent of the collected materials by weight. In 2019, the County collected 1,400 tons of recyclable materials through their convenience center program. **Exhibit 3** provides the quantity of recyclable materials collected by commodity for the last three years.

Exhibit 3. Recyclable Materials Collected through County Convenience Centers



Residuals

One successful element of the County's recycling program is the limited amount of residuals (contamination) in the loads of recyclable materials transported for processing. The County provides educational materials to residents on the proper way to recycle. Additionally, County staff monitor residents' usage of the convenience centers to facilitate proper recycling and correct behavior when necessary. This level of attention and scrutiny brought to the program has resulted in a clean streams of materials brought to market.

Earlier in 2019, the County's recyclable materials processor required that the County pay for the disposal of residual material from their program. This requirement was implemented to help the processor manage increased costs because of the depressed market value of materials. SCS analyzed several months of data using scale tickets from Southern Scrap to estimate the residual rate from the County's recyclable materials. Contamination rates for the months analyzed did not exceeded four percent by weight, which is extraordinary based on recent studies conducted nationwide of municipal recycling programs. **Table 3** summarizes recycling contamination rates for select months in 2019.

Table 3. Contamination Rates from Select Months in 2019

Month	Recycling Collected (Tons)	Contamination (Tons)	Contamination Rate (%)
February	146	3.8	2.6%
April	103	2.5	2.4%
May	113	3.7	3.3%
June	97	3.7	3.8%

CONTRACTS AND COSTS

Between July and October 2019, as a result of Southern Scrap announcing it would close by December 2019, Frederick County issued multiple invitations to bid (IFBs) for transportation and processing/marketing services for the recyclable materials collected through its convenience centers, The IFBs were for the following services:

- **July 18, 2019 - Recycling Processing and Marketing Services:** The County received four bids to accept all or select commodities of its recyclable materials. Apple Valley Waste in Hagerstown, MD offered the lowest tipping fees for all segregated recyclable material types.

- **August 8, 2019 - Plastics Hauling Services:** Because Southern Scrap stopped accepting plastic, the County issued an IFB for transporting plastic containers to Apple Valley Waste in Hagerstown, MD. Two bids were submitted and Republic Services offered the lowest fee for collecting plastic from 8-cy collection containers in a front end loading collection vehicle that compacted plastic containers from multiple 8-cy collection containers.

- **October 25, 2019 - Recyclables Hauling Services:** In preparation of Southern Scrap closing in December 2019, the County issued an IFB for transporting recycling all commodities to Apple Valley Waste, cardboard to Republic Services in Hagerstown, MD, and metal cans to Winchester Scrap. Republic Services was the sole bidder.

Republic has been transporting plastic containers from the convenience centers to Apple Valley Waste since August 2019. The County will begin transporting all recyclable materials to Apple Valley Waste (via hauling services by Republic) in December 2019.

Transportation

Transportation to Closest Processing Facility

Transporting recycling materials to the nearest recycling processing facility helps to minimize transportation costs. **Table 4** presents the annual transportation costs associated with hauling recyclable commodities to their closest market.

Table 4. Annual Transportation Cost to Closest Processing Facility

Commodity	Destination	Container Size	Annual Pulls	Cost per Pull	Annual Cost
Mixed Paper	Apple Valley Waste	30-yard	120	$321.00	$38,520
Cardboard	Republic, Hagerstown, MD	8-yard	2,496 [B]	$52.64	$145,789 [C]
Plastic Containers	Apple Valley Waste	8-yard	1,144 [A]	$70.31	$80,435
Metal Cans (steel & aluminum)	Winchester Scrap	30-yard	60	$125.00	$7,500
Total					**$272,244**
				$/ton	**$193**

[A] Assumes one frontload truck, containing 22 8-cy containers, per week (52 weeks/yr x 22 8-cy containers =1,144 pulls/yr)

[B] Assumes 48 8-cy containers each week (48 containers x 52 weeks/yr = 2,496 pulls/yr)

[C] Includes $14,400 for annual cost to rent 48 8-cy containers.

Transportation of All Materials to Apple Valley Waste

Apple Valley Waste, while 40 miles farther than Winchester Scrap (the closest processing facility for metal cans), offers lower tipping fees for some materials. Table 5 presents the annual transportation costs associated with hauling all recyclable materials from the County's convenience centers to Apple Valley Waste in Hagerstown, MD.

Table 5. Annual Transportation Cost to Apple Valley Waste

Commodity	Destination	Container Size	Annual Pulls	Cost per Pull	Annual Cost
Mixed Paper	Apple Valley Waste	30-yard	120	$321.00	$38,520
Cardboard	Apple Valley Waste	8-yard	2,496 [B]	$52.64	$145,789 [C]
Plastic Containers	Apple Valley Waste	8-yard	1,144 [A]	$70.31	$80,435
Metal Cans (steel & aluminum)	Apple Valley Waste	30-yard	60	$321.00 [D]	$19,260
Total					**$284,004**
				$/ton	**$201**

[A] Assumes one frontload truck, containing 22 8-cy containers, per week (52 weeks/yr x 22 8-cy containers =1,144 pulls/yr)

[B] Assumes 48 8-cy containers each week (48 containers x 52 weeks/yr = 2,496 pulls/yr)

[C] Includes $14,400 for annual cost to rent 48 8-cy containers.

[D] Assumes that Republic will charge similar fees as hauling cardboard.

Hauling metal cans to Apple Valley Waste instead of Winchester Scrap will cost the county an additional $12,000 annually.

Savings Related to Compaction of Plastic Containers and Cardboard

The annual transportation costs presented in Table 4 and Table 5 include collection of plastic containers and cardboard from 8-cy collection containers via a front end load collection vehicle. This collection method allows a "milk run" by a front end load collection vehicle to aggregate materials from multiple convenience centers in the County before hauling them roughly 40 miles to Apple Valley Waste and/or Republic's Cardboard Facility, both in Hagerstown, MD.

Front end load collection vehicles are typically more expensive for hauling material than roll-off containers due to the many mechanical features used to lift and empty dumpsters and compact the contents. Cardboard and single-stream recyclables (bottles/cans and paper/cardboard all mixed together) are frequently collected from the commercial sector by private haulers utilizing front end load collection vehicles; however, it is uncharacteristic for source separated plastic bottles to be collected using a front end load collection vehicle. The willingness of Republic Services to use a front end collection vehicle for plastic bottles and jugs has reduced the number of trips to Apple Valley Waste in Hagerstown, MD thus reducing transportation costs for the County.

By compacting multiple collection containers of plastic bottles/jugs and cardboard via a front end load collection vehicle before transportation to processing facilities 40 miles away, the County is able to reduce the number of trips necessary to transport these materials to a processing facility. This reduction in annual transportation costs has allowed the recycling program to continue.

Table 6 presents the cost savings related to the "milk run" collection method for plastic bottles and jugs and cardboard which is about $216,000 annually.

Table 6. Savings Related to Compaction of Plastic and Cardboard

Commodity	Destination	Container Size	Annual Pulls	Cost per Pull	Annual Cost
Plastic Containers	Apple Valley Waste	30-yard	650 [A]	$321.00	$208,650
		8-yard	1,144 [B]	$70.31	$80,435
Savings by Compacting Plastic Containers					**$128,215**
Cardboard	Apple Valley Waste	30-yard	728 [C]	$321.00	$233,688
		8-yard	2,496 [D]	$52.64	$145,789 [E]
Savings by Compacting Cardboard					**$87,899**
			Total Annual Savings from Compaction		**$216,114**

[A] Assumes 54 pulls per month (54 x 12 = 648 pulls/yr) plus two pulls from Star Tannery per year = 650

[B] Assumes one frontload truck, containing 22 8-cy containers, per week (52 weeks/yr x 22 8-cy containers =1,144 pulls/yr)

[C] Average collection frequency from FY2019

[D] Assumes 48 8-cy containers each week (48 containers x 52 weeks/yr = 2,496 pulls/yr)

[E] Includes $14,400 for annual cost to rent 48 8-cy containers.

Processing

Tipping Fees at Closest Processing Facility

As shown in Table 7, minimizing transportation by sending each material commodity to its closest processing facility results in about $44,000 in annual tipping fees. Tipping fees at Apple Valley Waste, the closest facility that accepts mixed paper and plastic bottles/jugs, are $25 and $60 per ton, respectively. Even though transportation costs to Apple Valley Waste and Republic's Cardboard Baling Facility in Hagerstown are the same, there is a significant difference in tipping fees: Apple Valley Waste charges $0 whereas Republic charges $30/ton. Similarly, Winchester Scrap charges no tipping fee for metal cans; however, as shown in Table 8, Apple Valley Waste charges significantly higher tipping fees for metal cans

Table 7. Annual Tipping Fees at Closest Processing Facilities

Commodity	Destination	Annual Tons	Tipping Fee ($/Ton)	Annual Cost
Mixed Paper	Apple Valley Waste	500	$25.00	$12,500
Cardboard	Republic, Hagerstown, MD	620	$30.00	$18,600
Plastic Containers	Apple Valley Waste	215	$60.00	$12,900
Steel Cans	Winchester Scrap	50	$0.00 [A]	$0
Aluminum Cans	Winchester Scrap	25	$0.00 [A]	$0
Total		**1,410**		**$44,000**
			$/ton	**$31**

[A] Winchester Scrap does not have a processing fee for metals

Tipping Fees for All Materials at Apple Valley Waste

Apple Valley Waste, while 40 miles farther than Winchester Scrap (the closest processing facility for metal cans), offers lower tipping fees cardboard but higher tipping fees for metal cans. The overall result for sending all materials to Apple Valley waste is a savings in tipping fees of $15,850 as presented in Table 8.

Table 8. Annual Tipping Fees for All Materials to Apple Valley Waste

Commodity	Destination	Annual Tons	Tipping Fee ($/Ton)	Annual Cost
Mixed Paper	Apple Valley Waste	500	$25.00	$12,500
Cardboard	Apple Valley Waste	620	$0.00	$0
Plastic Containers	Apple Valley Waste	215	$60.00	$12,900
Steel Cans	Apple Valley Waste	50	$30.00	$1,500
Aluminum Cans	Apple Valley Waste	25	$50.00	$1,250
Total		**1,410**		**$28,150**

Total Costs

Annual transportation costs and tipping fees associated with the collection of about 1,410 tons of material collected from Frederick County convenience centers is just over $312,000. As presented in Table 9 below, the County will save just over $4,000 annually by sending all recyclable materials to Apple Valley Waste for processing and marketing.

Table 9. Annual Transportation Cost to Apple Valley Waste

Commodity	Destination	Transportation	Tipping Fees	Total Cost
All Materials	Closest Facility	$272,244	$44,000	$316,244
	Apple Valley Waste	$284,004	$28,150	$312,154
Annual Savings from Using Apple Valley Waste for All Material				**$4,090**

4 RECYCLING PROGRAM OPTIONS

This section provides details on potential long-term recycling program options, which include the following:

- Option #1 – Transport All Material to Apple Valley Waste (Status Quo)
- Option #2 – Develop a County-Owned Local Aggregation and Baling Facility
- Option #3 – Utilize Local Private Recycling Facility

OPTION #1 TRANSPORT MATERIAL TO APPLE VALLEY WASTE

Overview

For this option the County would continue to operate their recycling program as is and the materials would be transported to Apple Valley Waste in Hagerstown, MD. Throughout the latter half of 2019, Frederick County secured contracts for the transportation and processing/marketing of recyclable materials with Apple Valley Waste as they offered the most favorable tipping fees, This is because Apple Valley Waste directs separated materials delivered from Frederick County directly to their baler, avoiding the single-stream sorting system.

Republic Services cardboard baling operation in Hagerstown, Maryland

Recycling facilities operated by Waste Management and Republic Services in Manassas, Virginia offered tipping fees significantly higher during the IFB process. These facilities both process single-stream recyclables and likely planned to process the County's separated materials through their system, offering no discount for the material being separated by material type. The County's low contamination rates likely played a role in Apple Valley Waste's favorable tipping fees, allowing the material to bypass the sorting system and go directly to the baler.

Benefits

SCS identified the following benefits for the County to continue utilizing Apple Valley Waste:

- Established/Known Market – Apple Valley Waste has invested significant capital in the infrastructure and equipment of their facility and has established buyers for the commodities that are produced. SCS toured their facility and found it to be clean and well managed; the facility manager has over 20 years of experience working for recycling processing facilities. Although there is no guarantee that this facility will continue to operate over the long-term, it appears to be well managed with a fair number of customers and material flow.

- Less Risk Over Short-Term – Relying on private industries to provide the essential processing and marketing of recyclable materials contains some risk. The current situation with Southern Scrap illustrates how market forces can have a strong impact on a well-established recycling program. However, industry experts are cautiously optimistic that the recycling markets will rebound, albeit

in two to five years. Using Apple Valley Waste allows the County to maintain its recycling program investment until additional options develop.

- **Public Desire to Recycle Maintained** - As Frederick County experienced, residents demand opportunities to recycle and that requires outlets for materials to flow.

- **Benefit from Low Contamination** – The County has built a reputation for providing clean recyclable materials for processing and marketing. In utilizing the existing markets with Apple Valley Waste, the County has established credibility in providing pure streams of materials with little contamination. In today's market, having a trusted partner in the recycling loop is a significant advantage and one that many recyclable material processers desire.

- **Public Education Maintained** – Frederick County recognizes that modifying the operations of their current source-separated convenience-center based recycling program, while can be done, is not desirable as the public is trained on how to properly use the program. Thus, utilizing Apple Valley Waste's MRF allows the service to continue.

Recyclable materials processing at Apple Valley Waste in Hagerstown, Maryland

Challenges

SCS identified the following challenges of using Apple Valley Waste:

- **Reduced Control** –Relying on privately owned and operated recycling facilities to accept materials is common practice by local governments throughout the country. Contracts can be structured to require advance notice of changes to the materials accepted; however, local governments will ultimately need to modify their recycling program to conform to the requirements of the recycling facility. The County experienced this situation when Southern Scrap suddenly stopped accepting plastic containers in mid-2019. This left the County only a short window of opportunity to find an additional market, as residents expected to continue recycling plastics. The solution was a new market outside of Virginia that significantly increased transportation costs for the County.

- **Loss of Economic Benefit** – Previously, Frederick County had relied on a local Winchester-based facility to accept their recyclable materials. Managing waste and recyclable materials locally has contributed to the local economy. Processing recyclable materials locally has economic benefits to Frederick County by creating jobs which are lost when the materials need to be transported to a distant facility.

- **Transportation Costs** – Currently, the effect of transportation on recycling program expenditures far outweighs the processing costs. Transportation costs to Hagerstown, about 50 miles away, are 90 percent of the recycling program costs; processing costs are only about 10 percent. The County has taken steps to reduce transportation costs, such as collecting materials in front-load containers in order to reduce the number of trips needed to Hagerstown.

- **Environmental** – Another challenge with transporting recyclable materials to markets in Hagerstown is the additional emissions that result from trucks moving these materials. The emissions related to the additional hauling is contributing additional air pollution that negatively impacts the community.

Costs

The County's plans of contracting with Republic Services to haul recyclable materials to Apple Valley Waste in Hagerstown, Maryland will be about $312,000 annually in transportation and processing fees. This equates to $221 per ton. **Table 10** presents the current annual recycling program costs.

Table 10. Current Annual Recycling Program Costs

Commodity	Destination	Transportation	Processing	Total	$/Ton
Mixed Paper	Apple Valley Waste	$38,520	$12,500	$51,020	$102
Cardboard	Apple Valley Waste	$145,789	$0	$145,789	$235
Plastic Containers	Apple Valley Waste	$80,435	$12,900	$93,335	$434
Steel Cans	Apple Valley Waste	$19,260	$1,500	$20,760	$415
Aluminum Cans	Apple Valley Waste		$1,250	$1,250	$50
Total		**$284,004**	**$28,150**	**$312,154**	**$221**
Percent of Total Annual Cost		**91.0%**	**9.0%**		

OPTION #2 DEVELOP A COUNTY-OWNED LOCAL AGGREGATION AND BALING FACILITY

Overview

With the anticipated closure of Southern Scrap, the County can consider developing its own facility to aggregate and condense its recyclables, thus reducing transportation costs. The added expense to remove contaminants and sort materials into marketable commodities is unnecessary because the County's source-separated recycling program produces clean streams of materials.

Page County, Virginia operates a similar program for its recyclable materials. Their convenience centers collect separated materials which are delivered to a County facility to be baled. The County uses two balers and stores the bales until sufficient quantities have accumulated to warrant collection from a private recycling company, Recycling and Disposal Solutions in Roanoke, Virginia. RDS does not charge the County for transportation or processing and even provides a nominal rebate to the County for their materials. Most notably, recycling companies often provide transportation at no cost to the local government to collect clean baled recyclable materials.

Benefits

SCS identified the following benefits of establishing recycling capacity in the region:

- **Increased Options & Reduced Transportation Costs** – Establishing an aggregation and baling facility for the County's recyclables affords the County with more options for their materials. Once materials are baled, and the bales have little to no contamination, there are more options to market the material. The condensed baled material will require significantly fewer trips to a

market, but more importantly, there are companies that will arrange for pickup of the baled material from the County's facility, allowing the County to avoid hauling costs to out-of-county markets.

- **Economic Expansion**– By establishing their own recycling facility, the County will be investing in local infrastructure to serve the needs of their constituents. A local recycling facility will create jobs during the planning, construction, and operational phases of the project. This can fuel economic growth in the County and region.

- **Environmental Impacts** – As discussed above, trucking recyclable materials to Hagerstown has a negative impact on the environment in the Shenandoah Valley. Conversely, managing recyclable materials locally mitigates those environmental concerns such as air pollution by reducing the number of miles it take to transport materials to market.

- **Existing Experience** – Other local governments, notably Page County, have established their own recycling facility where materials are baled. Frederick County would not be the first local government to implement this type of a program. The County could rely on the experience and information provided by Page County and others to help with implementing their own aggregation and baling facility. Relying on such experience has the potential to avoid pitfalls and common mistakes that may otherwise occur and be overlooked throughout all phases of the project.

Challenges

SCS identified the following challenges of establishing recycling capacity in the region:

- **Increased Risk** – With any new facility, there is risk associated with its implementation. The risk of such a facility is greater if the County opts to develop a facility sized to accept materials collected from programs that are not their own.

- **Cost** – As discussed above, having local recycling capacity affords the significant benefit of reducing transportation costs. However, should the County opt to finance a capital project such as an aggregation and baling facility, a significant amount of capital would be required.

- **Market Development** – If the County were to construct an aggregation and baling facility, additional planning would be required to identify markets for the baled materials.

Facility Specifications

The quantity of material processed affects the size of the building required for aggregating the materials and housing a baler. The County has options to size their facility to accept recyclable materials from recycling programs of other jurisdictions and/or the commercial sector. Additional material would improve economies of scale. **Table 11** presents the annual quantities of material in the County's recycling program as well as recycling programs in Clarke County, City of Winchester, and the commercial sector.

The City of Winchester collects is recyclables through a curbside dual stream program. To participate in the County's program, the City would need to separate material types either during or after collection.

Table 11. Annual Quantity of Recyclables from Other Programs

Source	Mixed Paper	Card-board	Plastic Bottle/Jugs	Metal Cans	Total
Frederick County	500	620	215	75	1,410
Clarke County	6	14	4	1	25
City of Winchester [A]	580	720	590	210	2,100
Commercial Sector [B]	0	4,890	0	0	4,890
Total	**1,086**	**6,244**	**809**	**286**	**8,425**

[A] The City of Winchester collectes about 2,100 tons annually through their curbside dual stream recylcing program. Annual tons by commodity have been estimated for this report.

[B] County businesses and organizations contract directly with private haulers such as Republic Services and Ridge Runner to deliver their source-separated cardboard to a recyclng facility.

SCS identified facility costs for the following four scenarios:

- **Option 2A (1,410 tons/year)** – Facility sized to accept only materials collected through Frederick County convenience centers;
- **Option 2B (3,353 tons/year)** – Facility sized to accept materials collected through Option 2A (1,410 tons/year from Frederick County) and materials collected from Clarke County (25 tons/year) and the City of Winchester (2,100 tons/year);
- **Option 2C (8,424 tons/year)** – Facility sized to accept materials collected through Option 2B and materials collected from the commercial sector (4,890 tons/year).
- **Option 2D (4,545 tons/year)** – Facility sized to accept materials collected through Option 2C; however, receives only half of the materials currently collected from the City of Winchester's curbside program and half of the privately-collected commercial sector cardboard.

The size of the aggregation and baling facility will vary based on the quantity of materials accepted. The following specifications are consistent for all size facilities:

- Facility will be constructed on County-owned land at the Landfill. See Appendix C for concept drawing.
- Recyclable materials will arrive at the facility source-separated by commodity; no separation or screening of materials for contamination will occur at the facility;
- Facility operation is for eight hours/day for five days/week (260 days/year);
- Facility can hold up to five days of incoming materials in bunkers. Bunkers will have walls that are 10 feet high and designed to hold a pile with 1:1 slope at the front;
- Facility will contain four bunkers, one each for cardboard, mixed paper, plastics, and metal cans; size of each material bunker will vary;
- Facility will include the following areas:

- **Incoming Storage Area** – The storage area is where the recyclable materials will be stored in bunkers;
- **Unload Area** – The unload area will be located in front of the bunkers and will measure the full width of the combined bunkers with 45 feet from the front of the bunkers;
- **Baler Area** – The baler area will include space (65' x 5') for the baler and 15' of open space immediately around three sides of the baler and 30' of space in front
- **Bale Storage Area** – The bale storage area will provide enough storage space for two trucks worth of each baled commodity (26 bales/truck for a total area of 208 bales).

Costs

Using the anticipated quantities of recyclable materials to be accepted under the options described above, the corresponding facility sizes and costs are presented in **Table 12**. Detailed facility sizing calculations are presented in Appendix A, and detailed construction cost estimates are presented in Appendix B.

Table 12. Aggregation and Baling Facility Costs for Varying Throughput

Communities Included	Frederick Co Only	Frederick Co Clark Co Winchester [A]	Frederick Co Clark Co Winchester [A] Commercial [C]	Frederick Co Clark Co Winchester [B] Commercial [D]
Tons/Year	**1,410**	**3,535**	**8,425**	**4,545**
Facility Size (sf)	**13,750**	**18,000**	**27,000**	**27,000**
Mobilization	$ 195,000	$ 238,000	$ 329,000	$ 329,000
Construction	$ 1,947,000	$ 2,377,000	$ 3,286,000	$ 3,286,000
Erosion & Sediment Control	$ 97,000	$ 119,000	$ 164,000	$ 164,000
Stormwater Management	$ 195,000	$ 238,000	$ 329,000	$ 329,000
Equipment				
Baler	$ 500,000	$ 500,000	$ 650,000	$ 650,000
Engineering	$ 97,000	$ 119,000	$ 164,000	$ 164,000
Total Cost	**$ 3,031,000**	**$ 3,591,000**	**$ 4,922,000**	**$ 4,922,000**
Annual Cost [B]	$ 368,000	$ 436,000	$ 598,000	$ 598,000
Annual Cost/Ton	$ 261	$ 123	$ 71	$ 132
Total with 40% Contingency	**$ 4,243,000**	**$ 5,027,000**	**$ 6,891,000**	**$ 6,891,000**
Annual Cost [B]	$ 515,000	$ 611,000	$ 837,000	$ 837,000
Annual Cost/Ton	$ 365	$ 173	$ 99	$ 184

[A] Assumes recyclable material from City of Winchester can be separated by materal type.

[B] Assumes only 50% of annual curbside recycling tonnage can be separated and delivered to a County baling facility.

[C] Assumes all privately hauled cardboard will be delivered to a County baling facility.

[D] Assumes only 50% of the commercial cardboard will be delivered to a County baling facility.

City of Winchester

Although a facility to serve the recycling needs of Frederick and Clarke counties and the City of Winchester is needed, variations in the types of programs operating may make cooperation on a facility challenging. The City of Winchester's curbside dual stream recycling program is in contrast to both Frederick and Clarke counties material-separated convenience-center based program. If the County were to build a facility and the City of Winchester participated, the City would need to modify their program so that materials are separated by commodity in addition to paying between $123 and $184 per ton for baling at the County's facility.

Transitioning a curbside program from dual stream to material-separated is a significant hurdle. SCS's discussions with staff from the City of Winchester indicate that the City may be willing to modify their program to accommodate a baling facility that processes materials from source-separated programs.

Commercial Sector

The County could establish a baling facility that not only accepts recyclable materials from municipal programs, but also accepts materials from private haulers operating in the County and surrounding region. A facility sized to accept material from private haulers would provide a recycling solution on a more regional scale and would fill a void that limits recycling in the commercial sector.

Much of the additional capacity needed to accommodate material collected by the commercial sector is for cardboard. SCS met with two local haulers, Republic Services and Ridgerunner Container Services, which together comprise about 85 percent of the commercial recycling hauling market in the County and surrounding area. These haulers primarily collect cardboard.

Building an aggregation and baling facility sized to accept all the recyclable materials from municipal programs (Frederick, Clarke, and Winchester) in addition to the majority of commercial cardboard would require a tipping fee between $71 and $99 per ton. If the County builds a facility sized to accept all municipal programs and the majority of the commercial sector, but only 50 percent of material from the City of Winchester and the commercial sector is delivered, the tipping fee would need to be between $132 and $184 to pay the debt service for the facility.

OPTION #3 UTILIZE LOCAL PRIVATE FACILITY

Overview

Another option for the County to consider as a long-term recycling solution is to utilize local recycling facilities that may become available. Similar to Option #2, the development of new recycling capacity by the private sector will take time so this option would not be available immediately. Currently, only Southern Scrap operates a recycling facility in Frederick County. However, this facility is expected to close in late 2019 or early 2020. This will leave a significant void in recycling capacity that will impact both municipalities and private industries.

The challenge of having no recycling capacity in the County may prompt private companies to invest in a local recycling facility. SCS had a number of conversations with staff from local waste management companies serving Frederick County about the expected recycling facility void created when Southern Scrap closes. Haulers expressed concern over the impact this will have on recycling, particularly the expected cost increases related to transporting materials longer distances. At least one local hauler that SCS interviewed, Ridgerunner Container Service (RCS), indicated they are

exploring the possibility of building their own recycling facility. RCS is well-established in the Northern Shenandoah Valley and boasts a significant share of the commercial recycling market. RCS mainly collects cardboard from commercial entities and will be forced to transport the materials out of the county when Southern Scrap closes. In exploring the construction of their own recycling facility, RCS desires to find a permanent long-term solution to control costs while continually meeting the recycling needs of Frederick County businesses. There may be opportunities for the County to dialogue with RCS to support this potentially new recycling facility.

SCS understands that having a local recycling facility serves the interests of residents and business owners in Frederick County. As such, the County may consider providing incentives to support the development of the facility. In return, the County needs to make sure that if a new recycling facility were to be built, that it can accommodate County materials as collected (i.e. separated by material type). Even though RCS primarily collects cardboard, it would be important for a new facility to accept other recyclable commodities such as plastic, metal cans, and mixed paper collected as part of the County's program.

Benefits

- **Reduced Costs –** Of the three recycling options presented in this report, this option has the potential to be the lowest cost option to the County for the following reasons:
  - The facility would be local, which significantly reduces recycling program operational costs, notably transportation;
  - A private entity would provide the capital needed to build the facility, so no capital expenditures would be required from the County.
- **Public-Private Partnership –** Should private industry invest in a local-recycling facility, the County would have the opportunity to show support for the project through tax rebates or expedited processing of regulatory approvals. The County could be viewed as leading an effort to establish recycling capacity that benefits residents and business owners.
- **Environmental and Economic –** Similar to option #2, a local recycling facility would provide for environmental and economic benefits. Environmental benefits would be realized through the significant reduction in transportation that would result in cleaner air. Investment in a local facility puts money into the local economy by creating local jobs and expanding the needs for goods and services throughout the planning, construction, and operating phases of the facility.

Challenges

- **Reduced Control –** Similar to option #1, relying on the private industry to be the sole provider of recycling capacity limits the County's ability to modify and expand its program. The County will be at the mercy of the entity that establishes the facility and will have little leverage if the owner and/or operator of the new facility decides to make a change to their operation that is inconsistent with the County's recycling program.

Costs

Costs to transport all recyclable materials from the County's convenience centers to a local baling facility is about $170,000 annually or $120 per ton as presented in **Table 13**.

Table 13. Annual Transportation Costs to a Local Processing Facility

Commodity	Destination	Container Size	Annual Pulls	Cost per Pull	Annual Cost
Mixed Paper	Local Facility	30-yard	120	$125.00 [C]	$15,000
Cardboard	Local Facility	8-yard	2,496 [B]	$20.50 [D]	$65,564 [E]
Plastic Containers	Local Facility	30-yard	650 [A]	$125.00 [C]	$81,250
Metal Cans (steel & aluminum)	Local Facility	30-yard	60	$125.00 [C]	$7,500
Total					**$169,314**
				$/ton	**$120**

[A] Assumes 54 pulls per month (54 x 12 = 648 pulls/yr) plus two pulls from Star Tannery per year.

[B] Assumes 48 8-cy containers each week (48 containers x 52 weeks/yr = 2,496 pulls/yr)

[C] Assumes that Republic will charge similar to fees for hauling metal cans to Winchester Scrap

[D] Assumes 61 percent reduction due to delivery to local facility

[E] Includes $14,400 for annual cost to rent 48 8-cy containers.

A local facility will dictate tipping fees but it is envisioned that the County's separated materials and low contamination rate will result in a favorable tipping fee. The County's current cost per ton (including both transportation and processing) at Apple Valley Waste is $221 per ton. Assuming $120 per ton to haul recyclables to a local facility, the tipping fee could be as low as $20 per ton (weighted average processing fee offered by Apple Valley Waste).

The recycling program in nearby Page County, Virginia bales its recyclable materials and is therefore able to attract a recycling processing facility to collect their baled materials at no cost to the County. It is assumed that a local privately-owned baling facility could also receive the same benefit. However, it is conservatively estimated that a local privately-owned facility could accept the County's recyclable materials for between $20 to $80 per ton to accommodate additional transportation to markets if needed. A private facility would also help Clarke County and the City of Winchester reduce their recycling program costs.

5 CONCLUSIONS

Frederick County's recycling program has been a well-organized and efficient operation that relied on contracts with private haulers and recyclers operating in the County. Unfortunately, in the summer of 2019, the single recycling processor in the County announced it would cease operation by December 2019. As a result, the County has issued three Invitations to Bid (IFBs) for recycling processing and hauling. The closest recycling processing facility that accepts all commodities collected at the County's convenience centers, Apple Valley Waste, is located in Hagerstown, MD about 50 miles from the convenience centers in the County.

The County's recycling program has experienced significant cost increases during the past two years, from the nationally depressed market for recyclable materials and the impending closure of the only local recycling processing facility. Hauling all recyclable materials to a local market is $120 per ton but hauling all recyclable materials to Apple Valley Waste will be $201 per ton, an increase of $80 per ton. The County's current plans are to haul recyclable material collected at its convenience to Apple Valley Waste for just over $312,000 annually or $221 per ton ($201 for transportation and $20 for tipping fees).

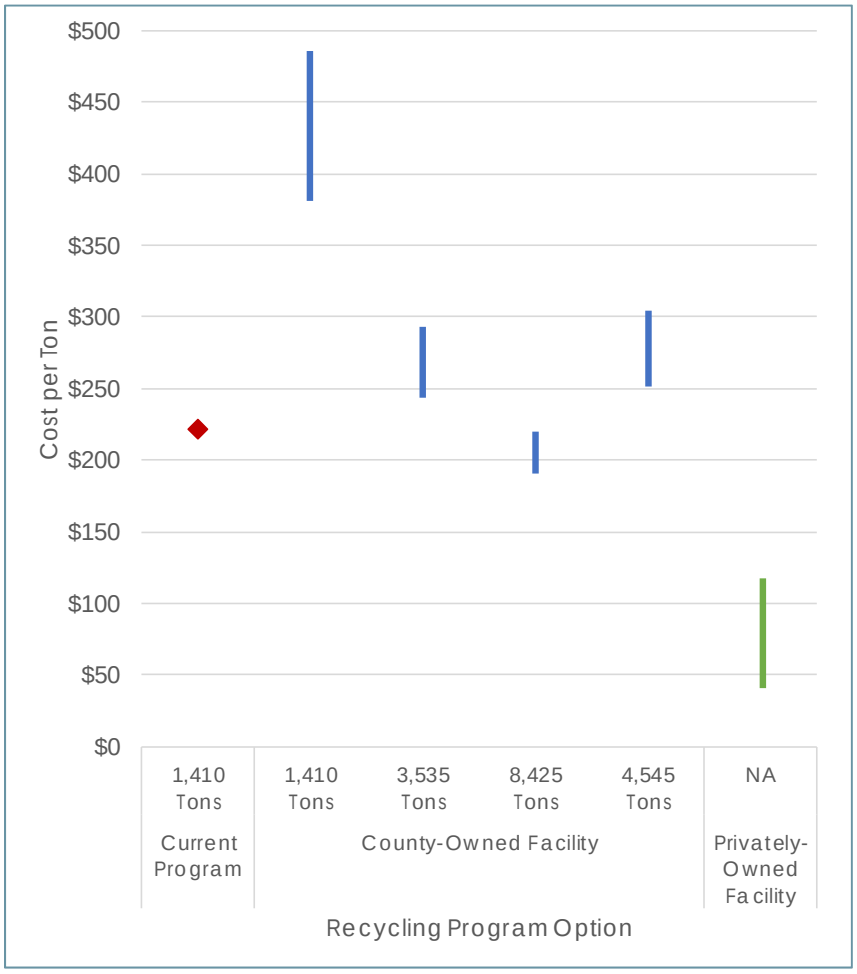
Developing an aggregation and baling facility at the County's landfill property has the potential to decrease transportation. **Table 14** presents the Annual unit costs per ton of recyclable materials processed.

Table 14. Cost for Transportation and Processing for Recycling Options

Option		Annual Tons	Annual Cost per Ton		
			Transport-ation	Processing/ Ammortization of Capital Costs	Total System Cost
1	**Status Quo** (All County Material to Apple Valley Waste)	1,410	$201	$20	$221
2	**Frederick County Baling Facility to Process Recyclables from:**				
	A Frederick County Only	1,410	$120	$261 to $365	$381 to $485
	B Frederick Co., Clarke Co. & Winchester	3,535	$120	$123 to $173	$243 to $293
	C Frederick Co., Clarke Co. Winchester, Commercial	8,425	$120	$ 71 to $99	$191 to $219
	D Frederick Co., Clarke Co. & 50% of Winchester/Commercial	4,545	$120	$132 to $184	$252 to $304
3	**All County Material to Local Private Facility**	1,410	$120	$ 20 to $80	$140 to $200

Exhibit 4 presents the recycling program unit costs ($/ton) for the options described above. The costs presented include transportation, processing and/or amortization of capital costs. The current recycling program unit cost is displayed by the red diamond; the unit cost ranges for a program that includes a county-owned baling facility are presented by the blue bars (four options for facility sizing based on throughput); and the green bar presents the unit cost range for utilizing a privately-owned facility.

Exhibit 4. Unit Cost Ranges for Recycling Program Options



Development of an aggregation and baling facility at the County landfill property reduces recycling system costs only if the City of Winchester can separate its collected recyclables by material type and private haulers to deliver all of their commercial sector cardboard. Both of these scenarios are unlikely and even then the tipping fee would need to be between $71 and $99 (depending on the cost to build the facility) to pay the annual debt service.

Construction costs presented in this report are planning-level cost estimates and are inherently high. To cover the increased cost of transporting material to Hagerstown instead of a local facility, the County could invest up to $1,2M (amortized over 10 years at an interest rate of four percent).

Options to reduce the planning-level construction costs presented in this report include:

- Utilizing or leasing an existing structure in the County or on County-owned property,
- Purchase a smaller baler or a used baler,
- Reduce size of building:

  - Buildings under 12,000 s.f. do not require fire protection sprinklers
  - Decrease incoming storage area and bale storage area
  - Consider storing plastic and metal outdoors
- Use gravel instead of asphalt paving,
- Reduce lighting and branch wiring.

Appendix A
Facility Size Calculations

Facility Accepting 1,410 Tons/Year

Area	Card-board	Mixed Paper	Plastic Bottles & Jugs	Metal Cans	Total
Incoming Storage Area					
Annual Tons	634	506	219	76	1,435
Tons/Day [A]	2.4	1.9	0.8	0.3	5.5
Storage Desired (pounds) [B]	24,000	19,000	8,000	3,000	55,000
Material Density (lbs/cy)	106	323	32	50	
Storage Volume (cy) [C]	226	59	250	60	595
Dimensions of Storage Bunkers					
Height (ft)	10	10	10	10	
Width (ft)	15	15	30	15	75
Depth (ft) D	46	16	28	16	
Total Incoming Storage Area (sf)	**690**	**240**	**840**	**240**	**2,010**
Unload Area					
Distance in front of bunkers (ft)	- -	- -	- -	- -	45
Total Width (ft)	- -	- -	- -	- -	75
Total Unload Area (sf)	**- -**	**- -**	**- -**	**- -**	**3,375**
Baler Area					
Baler w/Feed Conveyor (sf)	- -	- -	- -	- -	
Width (ft)	- -	- -	- -	- -	5
Depth (ft)	- -	- -	- -	- -	65
Allow 15 ft around 3 sides	- -	- -	- -	- -	95
Allow 30 feet in front	- -	- -	- -	- -	50
Total Baler Area (sf)	**- -**	**- -**	**- -**	**- -**	**4,750**
Bale Storage Area					
Number of 53' Trailers	2	2	2	2	8
Number of Bales per Trailer	26	26	26	26	104
Area per Bale (4'x8') (sf)	- -	- -	- -	- -	32
Total Bale Storeage Area (sf) [C]					**3,328**
Total Building Area (rounded)					**13,750**

[A] Facility will operate 8 hours/day, 5 days/week which equals 260 days per year

[B] Five days of material storage are planned

[C] Assume bales are stacked two high, floor area needed is for 104 bales

Facility Accepting 3,535 Tons/Year

Area	Card-board	Mixed Paper	Plastic Bottles & Jugs	Metal Cans	Total
Incoming Storage Area					
Annual Tons	1,354	1,086	809	286	3,535
Tons/Day [A]	5.2	4.2	3.1	1.1	13.6
Storage Desired (pounds) [B]	52,000	42,000	31,000	11,000	136,000
Material Density (lbs/cy)	106	323	32	50	
Storage Volume (cy) [C]	491	130	969	220	1810
Dimensions of Storage Bunkers					
Height (ft)	10	10	10	10	
Width (ft)	30	15	45	15	105
Depth (ft) D	49	28	63	45	
Total Incoming Storage Area (sf)	**1,470**	**420**	**2,835**	**675**	**5,400**
Unload Area					
Distance in front of bunkers (ft)	- -	- -	- -	- -	45
Total Width (ft)	- -	- -	- -	- -	105
Total Unload Area (sf)	**- -**	**- -**	**- -**	**- -**	**4,725**
Baler Area					
Baler w/Feed Conveyor (sf)	- -	- -	- -	- -	
Width (ft)	- -	- -	- -	- -	5
Depth (ft)	- -	- -	- -	- -	65
Allow 15 ft around 3 sides	- -	- -	- -	- -	95
Allow 30 feet in front	- -	- -	- -	- -	50
Total Baler Area (sf)	**- -**	**- -**	**- -**	**- -**	**4,750**
Bale Storage Area					
Number of 53' Trailers	2	2	2	2	8
Number of Bales per Trailer	26	26	26	26	104
Area per Bale (4'x8') (sf)	- -	- -	- -	- -	32
Total Bale Storeage Area (sf) [C]					**3,328**
Total Building Area (rounded)					**18,000**

[A] Facility will operate 8 hours/day, 5 days/week which equals 260 days per year

[B] Five days of material storage are planned

[C] Assume bales are stacked two high, floor area needed is for 104 bales

Facility Accepting 8,524 Tons/Year

Area	Card-board	Mixed Paper	Plastic Bottles & Jugs	Metal Cans	Total
Incoming Storage Area					
Annual Tons	6,244	1,086	809	286	8,425
Tons/Day [A]	24	4.2	3.1	1.1	32.4
Storage Desired (pounds) [B]	240,000	42,000	31,000	11,000	324,000
Material Density (lbs/cy)	106	323	32	50	
Storage Volume (cy) [C]	2264	130	969	220	3583
Dimensions of Storage Bunkers					
Height (ft)	10	10	10	10	
Width (ft)	90	15	60	15	180
Depth (ft) D	73	28	49	45	
Total Incoming Storage Area (sf)	**6,570**	**420**	**2,940**	**675**	**10,605**
Unload Area					
Distance in front of bunkers (ft)	- -	- -	- -	- -	45
Total Width (ft)	- -	- -	- -	- -	180
Total Unload Area (sf)	**- -**	**- -**	**- -**	**- -**	**8,100**
Baler Area					
Baler w/Feed Conveyor (sf)	- -	- -	- -	- -	
Width (ft)	- -	- -	- -	- -	5
Depth (ft)	- -	- -	- -	- -	65
Allow 15 ft around 3 sides	- -	- -	- -	- -	95
Allow 30 feet in front	- -	- -	- -	- -	50
Total Baler Area (sf)	**- -**	**- -**	**- -**	**- -**	**4,750**
Bale Storage Area					
Number of 53' Trailers	2	2	2	2	8
Number of Bales per Trailer	26	26	26	26	104
Area per Bale (4'x8') (sf)	- -	- -	- -	- -	32
Total Bale Storeage Area (sf) [C]					**3,328**
Total Building Area (rounded)					**27,000**

[A] Facility will operate 8 hours/day, 5 days/week which equals 260 days per year

[B] Five days of material storage are planned

[C] Assume bales are stacked two high, floor area needed is for 104 bales

Appendix B
Facility Cost Calculations

Facility Accepting 1,410 Tons/Year

Area		Unit Measure	Unit Cost	Number of Units	Cost
Mobilization					
	Assume 10% of Construction Cost	L.S.	- -	1	$ 194,694
Construction	**Substructure**				
	Slab on Grade [A]	S.F. SLAB	$ 25.00	13,750	$ 343,750
	Slab and Foundation Excavation [B]	S.F. GROUND	$ 0.50	13,750	$ 6,875
	4'Foundation Wall	L.F.	$ 100.00	475	$ 47,500
	Structure Shell				
	Pre-Engineered Steel Building [C]	S.F.	$ 25.00	13,750	$ 343,750
	Interiors				
	Concrete Push Walls [D]	S.F.	$ 15.00	3,000	$ 45,000
	Wall Finishes/Painting	S.F.	$ 1.50	12,000	$ 18,000
	Services				
	Water Distribution	S.F. FLOOR	$ 2.50	13,750	$ 34,375
	Exhaust Fans / Louvers	S.F. FLOOR	$ 0.35	13,750	$ 4,813
	Fire Protection Sprinklers [E]	S.F. FLOOR	$ 8.00	13,750	$ 110,000
	Standpipe & Fire Pump	S.F. FLOOR	$ 5.00	13,750	$ 68,750
	Electrical Service & Distribution [F]	S.F. FLOOR	$ 1.50	13,750	$ 20,625
	Lighting & Branch Wiring [H]	S.F. FLOOR	$ 11.00	13,750	$ 151,250
	Communications & Security [I]	S.F. FLOOR	$ 2.00	13,750	$ 27,500
	Site/Civil Work				
	Aggregate Sub-Base 8" Thick [J]	S.Y.	$ 35.00	9,500	$ 332,500
	Asphalt Intermediate Base 6" Thick [K]	S.Y.	$ 25.00	9,500	$ 237,500
	Asphalt Top Coat 2" Thick [L]	S.Y.	$ 10.00	9,500	$ 95,000
	Pavement, Striping 6" Width	L.F.	$ 2.00	250	$ 500
	Finish / Fine Grading	S.Y.	$ 2.00	9,500	$ 19,000
	General Excavation / Trenching [M]	B.C.Y.	$ 6.00	1,500	$ 9,000
	Compaction [N]	E.C.Y.	$ 1.50	1,500	$ 2,250
	Backfill	L.C.Y.	$ 6.00	500	$ 3,000
	General Fill	L.C.Y.	$ 6.00	500	$ 3,000
	Testing & Inspections [O]	DAY	$ 500.00	45	$ 22,500
	Signage	EA.	$ 100.00	5	$ 500
	TOTAL CONSTRUCTION				$1,946,938
Erosion & Sediment Control					
	Assume 5% of Construction Cost	L.S.	$ -	1	$ 97,347
Stormwater Management					
	Assume 10% of Construction Cost	L.S.	$ -	0	$ 194,694
Equipment					
	Baler	EA.	$ 2.00	2	$ 500,000
	Engineering (5% of Construction Cost)	L.S.	$ 26.00	26	$ 97,347
Total					**$3,031,019**
Contingency (40%)					**$1,212,408**
GRAND TOTAL					**$4,243,426**

Facility Accepting 3,535 Tons/Year

Area		Unit Measure	Unit Cost	Number of Units	Cost
Mobilization					
	Assume 10% of Construction Cost	L.S.	- -	1	$ 237,745
Construction	**Substructure**				
	Slab on Grade [A]	S.F. SLAB	$ 25.00	18,000	$ 450,000
	Slab and Foundation Excavation [B]	S.F. GROUND	$ 0.50	18,000	$ 9,000
	4'Foundation Wall	L.F.	$ 100.00	555	$ 55,500
	Structure Shell				
	Pre-Engineered Steel Building [C]	S.F.	$ 25.00	18,000	$ 450,000
	Interiors				
	Concrete Push Walls [D]	S.F.	$ 15.00	3,500	$ 52,500
	Wall Finishes/Painting	S.F.	$ 1.50	14,000	$ 21,000
	Services				
	Water Distribution	S.F. FLOOR	$ 2.50	18,000	$ 45,000
	Exhaust Fans / Louvers	S.F. FLOOR	$ 0.35	18,000	$ 6,300
	Fire Protection Sprinklers [E]	S.F. FLOOR	$ 8.00	18,000	$ 144,000
	Standpipe & Fire Pump	S.F. FLOOR	$ 5.00	18,000	$ 90,000
	Electrical Service & Distribution [F]	S.F. FLOOR	$ 1.50	18,000	$ 27,000
	Lighting & Branch Wiring [H]	S.F. FLOOR	$ 11.00	18,000	$ 198,000
	Communications & Security [I]	S.F. FLOOR	$ 2.00	18,000	$ 36,000
	Site/Civil Work				
	Aggregate Sub-Base 8" Thick [J]	S.Y.	$ 35.00	10,450	$ 365,750
	Asphalt Intermediate Base 6" Thick [K]	S.Y.	$ 25.00	10,450	$ 261,250
	Asphalt Top Coat 2" Thick [L]	S.Y.	$ 10.00	10,450	$ 104,500
	Pavement, Striping 6" Width	L.F.	$ 2.00	250	$ 500
	Finish / Fine Grading	S.Y.	$ 2.00	10,450	$ 20,900
	General Excavation / Trenching [M]	B.C.Y.	$ 6.00	1,500	$ 9,000
	Compaction [N]	E.C.Y.	$ 1.50	1,500	$ 2,250
	Backfill	L.C.Y.	$ 6.00	500	$ 3,000
	General Fill	L.C.Y.	$ 6.00	500	$ 3,000
	Testing & Inspections [O]	DAY	$ 500.00	45	$ 22,500
	Signage	EA.	$ 100.00	5	$ 500
	TOTAL CONSTRUCTION				$2,377,450
Erosion & Sediment Control					
	Assume 5% of Construction Cost	L.S.	$ -	1	$ 118,873
Stormwater Management					
	Assume 10% of Construction Cost	L.S.	$ -	0	$ 237,745
Equipment					
	Baler	EA.	$ 2.00	2	$ 500,000
	Engineering (5% of Construction Cost)	L.S.	$ 26.00	26	$ 118,873
Total					**$3,590,685**
Contingency (40%)					**$1,436,274**
GRAND TOTAL					**$5,026,959**

Facility Accepting 8,524 Tons/Year

Area		Unit Measure	Unit Cost	Number of Units	Cost
Mobilization					
	Assume 10% of Construction Cost	L.S.	- -	1	$ 328,640
Construction	**Substructure**				
	Slab on Grade [A]	S.F. SLAB	$ 25.00	27,000	$ 675,000
	Slab and Foundation Excavation [B]	S.F. GROUND	$ 0.50	27,000	$ 13,500
	4'Foundation Wall	L.F.	$ 100.00	700	$ 70,000
	Structure Shell				
	Pre-Engineered Steel Building [C]	S.F.	$ 25.00	27,000	$ 675,000
	Interiors				
	Concrete Push Walls [D]	S.F.	$ 15.00	5,200	$ 78,000
	Wall Finishes/Painting	S.F.	$ 1.50	17,000	$ 25,500
	Services				
	Water Distribution	S.F. FLOOR	$ 2.50	27,000	$ 67,500
	Exhaust Fans / Louvers	S.F. FLOOR	$ 0.35	27,000	$ 9,450
	Fire Protection Sprinklers [E]	S.F. FLOOR	$ 8.00	27,000	$ 216,000
	Standpipe & Fire Pump	S.F. FLOOR	$ 5.00	27,000	$ 135,000
	Electrical Service & Distribution [F]	S.F. FLOOR	$ 1.50	27,000	$ 40,500
	Lighting & Branch Wiring [H]	S.F. FLOOR	$ 11.00	27,000	$ 297,000
	Communications & Security [I]	S.F. FLOOR	$ 2.00	27,000	$ 54,000
	Site/Civil Work				
	Aggregate Sub-Base 8" Thick [J]	S.Y.	$ 35.00	12,350	$ 432,250
	Asphalt Intermediate Base 6" Thick [K]	S.Y.	$ 25.00	12,350	$ 308,750
	Asphalt Top Coat 2" Thick [L]	S.Y.	$ 10.00	12,350	$ 123,500
	Pavement, Striping 6" Width	L.F.	$ 2.00	250	$ 500
	Finish / Fine Grading	S.Y.	$ 2.00	12,350	$ 24,700
	General Excavation / Trenching [M]	B.C.Y.	$ 6.00	1,500	$ 9,000
	Compaction [N]	E.C.Y.	$ 1.50	1,500	$ 2,250
	Backfill	L.C.Y.	$ 6.00	500	$ 3,000
	General Fill	L.C.Y.	$ 6.00	500	$ 3,000
	Testing & Inspections [O]	DAY	$ 500.00	45	$ 22,500
	Signage	EA.	$ 100.00	5	$ 500
	TOTAL CONSTRUCTION				$3,286,400
Erosion & Sediment Control					
	Assume 5% of Construction Cost	L.S.	$ -	1	$ 164,320
Stormwater Management					
	Assume 10% of Construction Cost	L.S.	$ -	0	$ 328,640
Equipment					
	Baler	EA.	$ 2.00	2	$ 650,000
	Engineering (5% of Construction Cost)	L.S.	$ 26.00	26	$ 164,320
Total					**$4,922,320**
Contingency (40%)					**$1,968,928**
GRAND TOTAL					**$6,891,248**

Note:

A Assumed 12" reinforced concrete with vapor barrier & subbase

B Site prep for slab and excavation for footings & foundation walls

C 50' to 100' Clear Span, 24' eave height

D 12" thick, 10' high with amror plating

E Sprinklers, extra hazard, dry system system

F 200 amp service, panel and feeders

H High intensity discharge fixtures, recepticles, switches, etc.

I Alarm systems and emergency lighting

J Aggregate sub-base for pavement

K Aggregate intermediate base for pavement

L Asphalt top coat

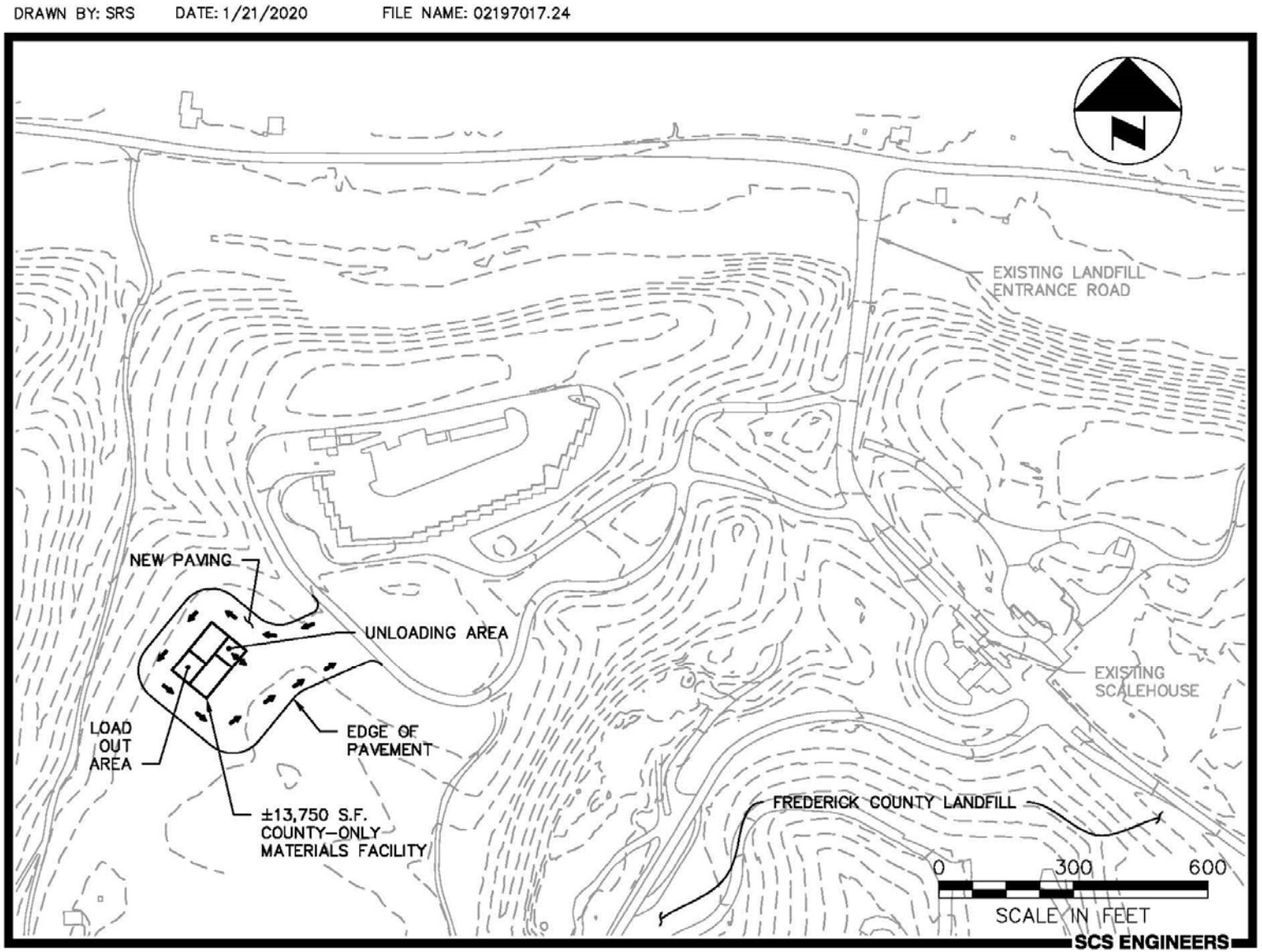
M 4' to g' depth

N Compaction w/vibrating roller

O 8 hours/day

Appendix C
County Aggregation and Baling Facility

Concept Drawing



COUNTY ONLY MATERIAL FACILITY CONCEPT SITE PLAN

COUNTY of FREDERICK
Department of Public Works
540/665-5643
FAX: 540/678-0682

MEMORANDUM

TO: Public Works Committee

FROM: Joe C. Wilder, Director of Public Works JCW

SUBJECT: Monthly Tonnage Report - Fiscal Year 19/20

DATE: January 22, 2020

The following is the tonnage for the months of July 2018 through June 2020, and the average monthly tonnage for fiscal years 03/04 through 19/20.

FY 03-04: **AVERAGE PER MONTH: 16,348 TONS (UP 1,164 TONS)**
FY 04-05: **AVERAGE PER MONTH: 17,029 TONS (UP 681 TONS)**
FY 05-06: **AVERAGE PER MONTH: 17,785 TONS (UP 756 TONS)**
FY 06-07: **AVERAGE PER MONTH: 16,705 TONS (DOWN 1,080 TONS)**
FY 07-08: **AVERAGE PER MONTH: 13,904 TONS (DOWN 2,801 TONS)**
FY 08-09: **AVERAGE PER MONTH: 13,316 TONS (DOWN 588 TONS)**
FY 09-10: **AVERAGE PER MONTH: 12,219 TONS (DOWN 1,097 TONS)**
FY 10-11: **AVERAGE PER MONTH: 12,184 TONS (DOWN 35 TONS)**
FY 11-12: **AVERAGE PER MONTH: 12,013 TONS (DOWN 171 TONS)**
FY 12-13: **AVERAGE PER MONTH: 12,065 TONS (UP 52 TONS)**
FY 13-14: **AVERAGE PER MONTH: 12,468 TONS (UP 403 TONS)**
FY 14-15: **AVERAGE PER MONTH: 13,133 TONS (UP 665 TONS)**
FY 15-16: **AVERAGE PER MONTH: 13,984 TONS (UP 851 TONS)**
FY 16-17: **AVERAGE PER MONTH: 14,507 TONS (UP 523 TONS)**
FY 17-18: **AVERAGE PER MONTH: 15,745 TONS (UP 1,238 TONS)**
FY 18-19: **AVERAGE PER MONTH: 16,594 TONS (UP 849 TONS)**
FY 19-20: **AVERAGE PER MONTH: 17,900 TONS (UP 1,306 TONS)**

MONTH	FY 2018-2019	FY 2019-2020
JULY	17,704	17,956
AUGUST	18,543	17,267
SEPTEMBER	14,799	17,985
OCTOBER	18,158	22,528
NOVEMBER	15,404	17,304
DECEMBER	14,426	14,362
JANUARY	13,973	
FEBRUARY	12,764	
MARCH	17,079	
APRIL	20,313	
MAY	19,443	
JUNE	16,519	

JCW/gmp

RECYCLING REPORT - FY 19/20

MONTH	GLASS	PLAST	AL CANS	STEEL CANS	PAPER	OCC	SHOES/TEX	ELEC	SCRAP	TOTAL
JUL	0	51,239	7,345	10,419	101,420	65,520		52,480	307,920	596,343
AUG		30,500	5,450	8,699	70,040	100,240	20,980	28,300	280,080	544,289
SEP		174,840	3,903	4,937	58,100	68,350		57,500	232,140	599,770
OCT		18,340	3,832	5,714	60,180	95,000	5,100	27,800	290,020	505,986
NOV		26,440	2,640	4,135	91,720	93,580		40,060	198,600	457,175
DEC		13,600			41,440	80,460	5,480	31,180	161,960	334,120
JAN		3,080			65,400	63,200				131,680
FEB										0
MAR										0
APR										0
MAY										0
JUN										0
TOTAL	0	318,039	23,170	33,904	488,300	566,350	31,560	237,320	1,470,720	3,169,363
FY 18-19	0	430,963	47,082	96,494	998,815	1,243,232	83,104	467,720	2,909,857	6,277,267
FY 17-18	0	465,080	53,224	94,530	1,066,300	1,080,087	37,260	536,420	2,874,709	6,207,610
FY 16-17	372,600	430,435	41,002	89,976	1,082,737	1,009,153	37,220	495,500	2,687,241	6,245,864
FY 15-16	919,540	428,300	52,077	97,252	1,275,060	974,493	48,820	480,400	2,376,344	6,652,286
FY 14-15	895,600	407,703	40,060	97,515	1,272,660	893,380	49,440	532,283	1,890,729	6,079,370
FY 13-14	904,780	417,090	39,399	99,177	1,281,105	902,701	37,800	611,580	1,639,225	5,932,937
FY 12-13	913,530	410,338	45,086	102,875	1,508,029	878,450	39,700	502,680	1,321,938	5,722,626
FY 11-12	865,380	398,320	43,884	99,846	1,492,826	840,717	37,920	484,600	1,432,678	5,696,171
FY 10-11	949,185	378,452	42,120	98,474	1,404,806	824,873	41,700	467,920	1,220,107	5,427,637
FY 09-10	1,123,671	370,386	42,844	96,666	1,235,624	671,669	21,160	435,680	1,348,398	5,346,098
FY 08-09	762,810	322,928	23,473	55,246	1,708,302	564,957	28,780	404,760	1,097,151	4,968,407
FY 07-08	794,932	284,220	15,783	40,544	1,971,883	545,692	0	498,110	1,172,880	5,324,044
FY 06-07	600,464	200,720	11,834	29,285	1,684,711	441,321	0	382,574	550,070	3,900,979
FY 05-06	558,367	190,611	12,478	28,526	1,523,162			381,469	204,220	2,898,833
FY 04-05	549,527	193,224	11,415	27,525	1,552,111			273,707	25,080	2,632,589
FY 03-04	541,896	174,256	11,437	31,112	1,443,461			156,870	336,230	2,695,262
FY 02-03	413,627	146,770	9,840	23,148	1,381,195			62,840	171,680	2,209,100
FY 01-02	450,280	181,040	10,565	25,553	1,401,206			54,061	58,140	2,180,845
FY 00-01	436,615	198,519	10,367	24,988	1,759,731				9,620	2,439,840
FY 99-00	422,447	177,260	10,177	22,847	1,686,587				44,180	2,363,498
FY 98-99	402,192	184,405	9,564	22,905	1,411,950				48,810	2,079,826
FY 97-98	485,294	136,110	13,307	29,775	1,830,000					2,494,486
FY 96-97	373,106	211,105	23,584	46,625	1,690,000					2,344,420
FY 95-96	511,978	167,486	28,441	44,995	1,553,060					2,305,960
TO DATE	14,247,821	6,009,678	548,737	1,234,855	33,150,206	8,547,406	342,540	6,225,034	17,634,721	87,941,078

FREDERICK COUNTY ESTHER BOYD ANIMAL SHELTER FY 2019-2020

DOG REPORT

MONTH	ON HAND AT FIRST OF MONTH	RECEIVED AT KENNEL	BROUGHT IN BY ACO	BITE CASES	BORN AT KENNEL	ADOPTED	RECLAIMED	DISPOSED	DIED AT KENNEL	ESCAPED/ STOLEN	CARRIED OVER NEXT MONTH
JULY	63	33	36	1	0	54	38	7	0	0	34
AUG	34	30	29	0	0	39	19	1	0	0	34
SEP	34	36	23	1	0	21	24	1	0	0	48
OCT	48	19	23	0	0	30	25	3	0	0	32
NOV	32	22	36	1	0	19	31	1	0	0	40
DEC	40	24	41	1	0	33	32	2	1	0	38
JAN											
FEB											
MAR											
APR											
MAY											
JUN											
TOTAL	251	164	188	4	0	196	169	15	1	0	226

In the month of December - 106 dogs in and out of kennel. 5 dogs transferred to other agencies.

FREDERICK COUNTY ESTHER BOYD ANIMAL SHELTER FY 2019-2020

CAT REPORT

MONTH	ON HAND AT FIRST OF MONTH	RECEIVED AT KENNEL	BROUGHT IN BY ACO	BITE CASES	BORN AT KENNEL	ADOPTED	RECLAIMED	DISPOSED	DIED AT KENNEL	ESCAPED/ STOLEN	CARRIED TO NEXT MONTH
JULY	84	136	8	2	7	36	1	78	5	0	117
AUG	117	90	5	1	9	57	1	37	3	0	124
SEP	124	90	5	3	20	39	2	51	3	0	147
OCT	147	81	6	0	4	51	2	83	4	0	98
NOV	98	61	2	1	0	23	3	36	1	0	99
DEC	99	43	1	0	0	47	3	18	1	0	74
JAN											
FEB											
MAR											
APR											
MAY											
JUN											
TOTAL	669	501	27	7	40	253	12	303	17	0	659

In the month of December - 143 cats in and out of shelter. 17 cats transferred to other agencies.