TOWN OF BELLEAIR
INC. 1925

DRAFT REPORT

Solid Waste and Recycling Collection Analysis

APRIL 27
2021

PREPARED FOR

Town of Belleair, Florida
Solid Waste Department
901 Ponce de Leon Boulevard
Belleair, Florida 33756

SUBMITTED BY

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Section 1
Executive Summary

In 2020, the Town of Belleair (Town) contracted Kessler Consulting, Inc. (KCI) to conduct an operational review of its Solid Waste Department's (Department) collection program for curbside residential recycling and to determine options for consideration in providing the service moving forward. This project was then expanded to include a review of operational costs and considerations for all collection activities performed by the Town.

This report reviews the costs associated with the provision of curbside recycling collection services provided by the City of Clearwater (Clearwater) as a service provider, versus potential costs and requirements for performing the service through another means (including in-house service or through other outsourcing options). This process included the review of current monthly billings from Clearwater as well as a financial analysis of the costs and impacts of performing the same service with in-house operations. This review also included research into other potential outsourced providers for the services.

This analysis showed that the annual cost of providing the service of curbside automated residential recycling would be less overall to the Town than utilizing the current contract with Clearwater, after purchase of the initial capital costs. This analysis reviewed the impacts to the City budget if it purchased an automated side-load (ASL) truck and hired a driver to operate it, as well as impacts to maintenance, fuel, and other operations.

Upon review of this information, the Town requested that KCI review potential cost benefits of these operations across the primary solid waste collection line of business as well as to determine impacts to the fund and to operations, overall.

This analysis determined that a transition to an automated curbside solid waste and recycling program, with rear-load manual collection support, would be in the Town's financial best interests and would not require increases in the Solid Waste budget overall. This is due to the benefits of automated collection and the efficiency in this process. This report outlines the current programs managed by the Town as well as the analysis and findings of this project.

While this transition is financially beneficial to the Town, a public education and outreach campaign is recommended to educate the residents on a new collection system and how to properly utilize it.

Section 2
Current Programs and Services Overview

2.1 City-Provided Collection

The Town of Belleair provides solid waste collection for residential garbage, recycling and yard waste curbside as well as rear-end loading (REL) service to multi-family and commercial customers within the Town's limits. The residential garbage, yard waste, and multi-family / commercial garbage services are all provided by in-house staff utilizing a fleet of four REL garbage vehicles. Recycling collection services for residential curbside, multi-family and commercial, are all provided through a contract with Clearwater, utilizing an ASL collection truck.

Residential garbage collection is performed twice per week either on a Monday/Thursday or Tuesday/Friday collection schedule and is set out in cans and bags for pick up by Town employees. Recycling is collected once per week in wheeled carts designed for automated collection and owned by the Town. Yard waste is collected along with residential garbage in REL trucks. Commercial customers are serviced based upon their service level requests with the Town.

All garbage is then transported directly to the Pinellas County Waste to Energy Facility. Recyclable materials are processed at the Clearwater-owned recycling facility. The Town currently pays for the processing of materials for both services on a per-ton basis.

The Town has a collection staff of four operators and a Department Director who also provides substitute driving support when needed. Currently all four operators are providing collection services each day. The Town uses temporary labor or internal staffing to maintain their high level of service when days off need to be covered. This presents that there is little downtime for both staff and vehicles, and as such difficult to manage from an operational standpoint.

Figure 1 is the Town's solid waste collection schedule as advertised on the Town's website.

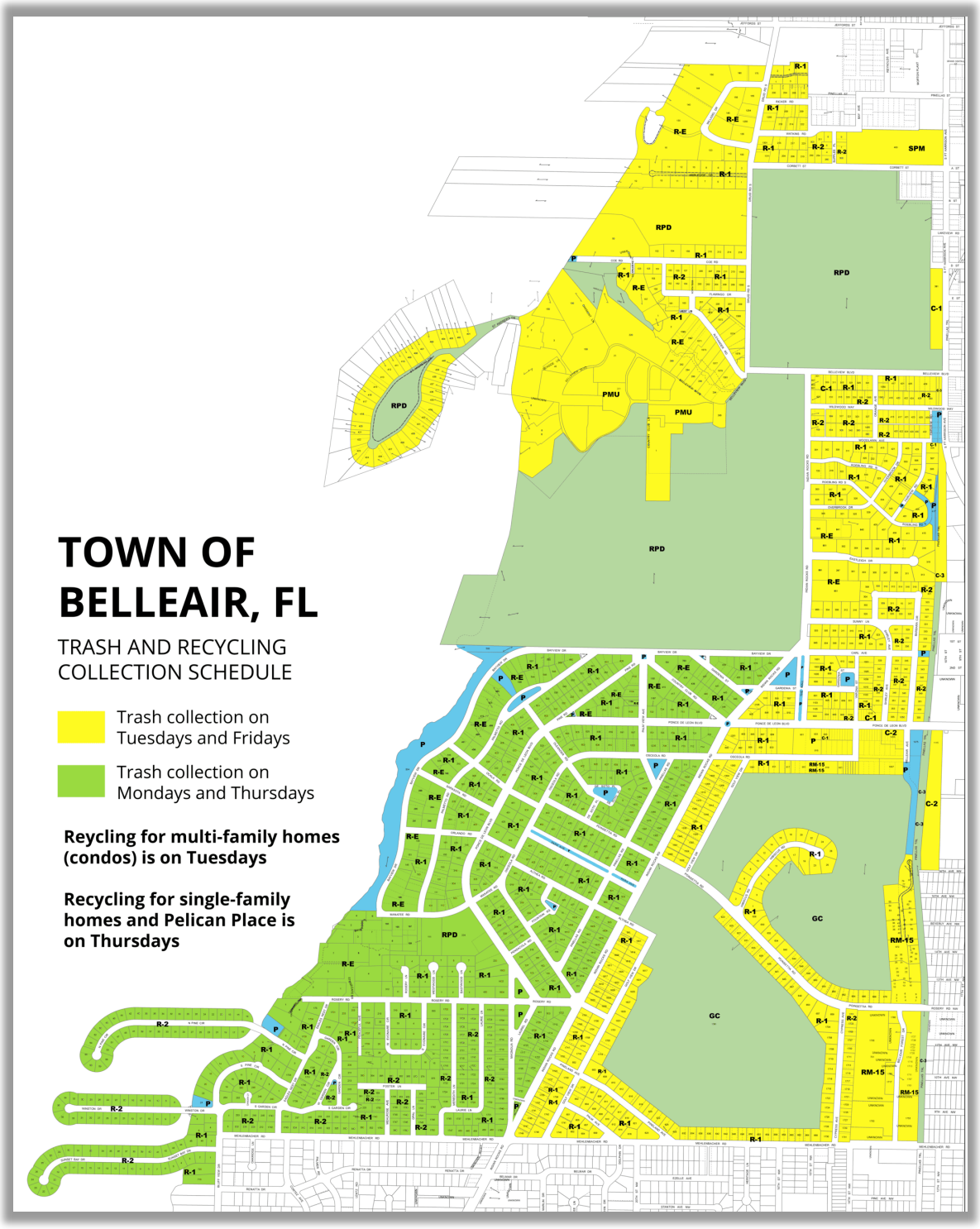


Figure 1: Town of Belleair, Florida Trash and Recycling Collection Schedule

2.2 Curbside Automated vs. Manual Collection

2.2.1 Manual Collection (Rear Loading Vehicles)

The Town utilizes four REL solid waste vehicles, equipped with cart tippers, for semi-automated material collection. These vehicles are the most prevalent types of solid waste collection vehicles used in the United States. This is predominantly due to their relative simplicity of operation versus other models and the ability to service them. However, these models require significant manual operation, requiring two to three staff members on each truck to be effective and efficient in collection.

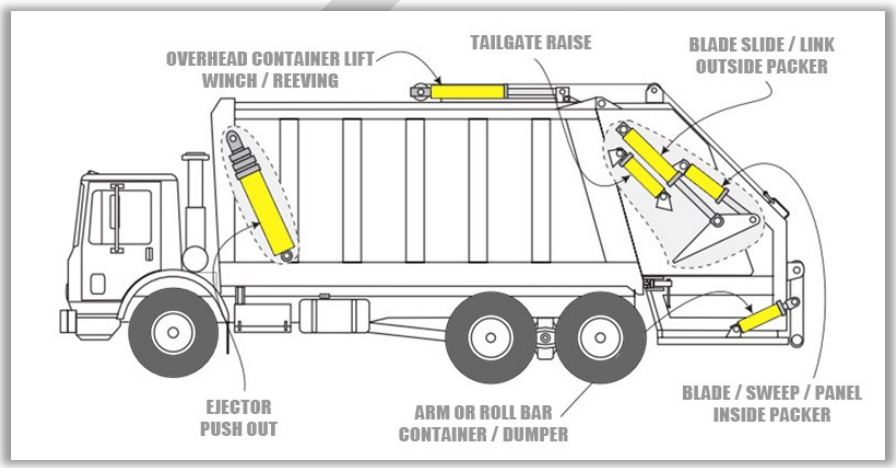


Figure 2: Rear Loading Garbage Truck and Hydraulics Schematic
Image Courtesy of Wastebuilt.com

Manual, or semi-automated collection in the Town's case (due to the cart tippers) is a process where the operators or workers on the vehicle must physically exit the truck, pick up garbage (either loose, in bags, or in cans) and dump the materials in the rear facing hopper for collection. This style of collection imposes great physical requirements upon the workers and in turn increases workers' compensation and injury issues due to the impacts on the workers themselves.

Manual collection can pick up somewhere between 500-750 stops per day based upon the type of area being collected (specifically the closeness of stops and the traffic on the streets). Also to be considered is the amount of material being collected and the distance traveled to and from the routed areas to the disposal or processing location.

2.2.2 Automated Collection (Side Loading Vehicles)

The Town also has provisions for fully automated collection which utilizes side loading vehicles with specialty arms built into the body for the provision of picking up automation ready carts curbside without needing to exit the cab of the vehicle. This type of collection is becoming more prevalent in the United States due to the impacts on efficiency of collection as well as the benefits to the health and well-being of the operators, keeping them from the physical aspects of manual collection.

In the Town, Clearwater currently utilizes this technique with their ASL fleet to collect recyclable materials from Town-owned carts provided to customers. This provides Clearwater the ability to collect these materials along with other customers within their City limits in a timely fashion due to the efficiency of collection obtained. This method of collection can typically pick up between 700-1,000 stops per route depending on the same variables listed in Section 2.2.1.

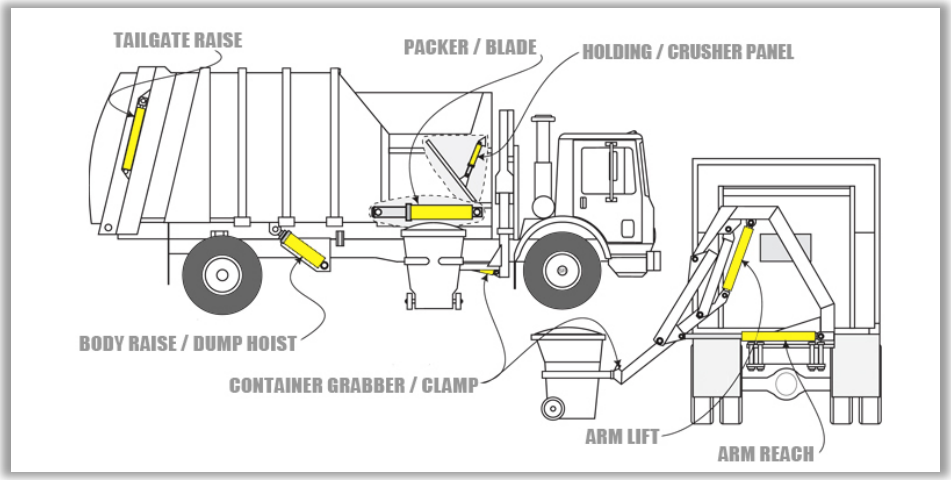


Figure 3: Side Loader Garbage Truck including Hydraulics Schematic
Image Courtesy of Wastebuilt.com

The Town utilizes cart tipping rigs that are attached the rear hopper to provide this service in times of need. This process still requires the operators to leave the cab of the truck and move the cart to the cart tipper to be tipped. This reduces but does not completely remove the physical requirements set upon the operators, and thereby does not necessarily reduce workers' compensation claims and injuries to personnel.

Some of the most common safety issues are created when entering and exiting the truck – improper stepping leads to twisted ankles, tripping occurs from untied bootlaces, slipping on wet surfaces, or, in some cases, major injury from falling under the truck when exiting. Additionally, sprains and strains are common injuries that occur with bending, lifting, and tipping.

Section 3
Curbside Recycling Analysis

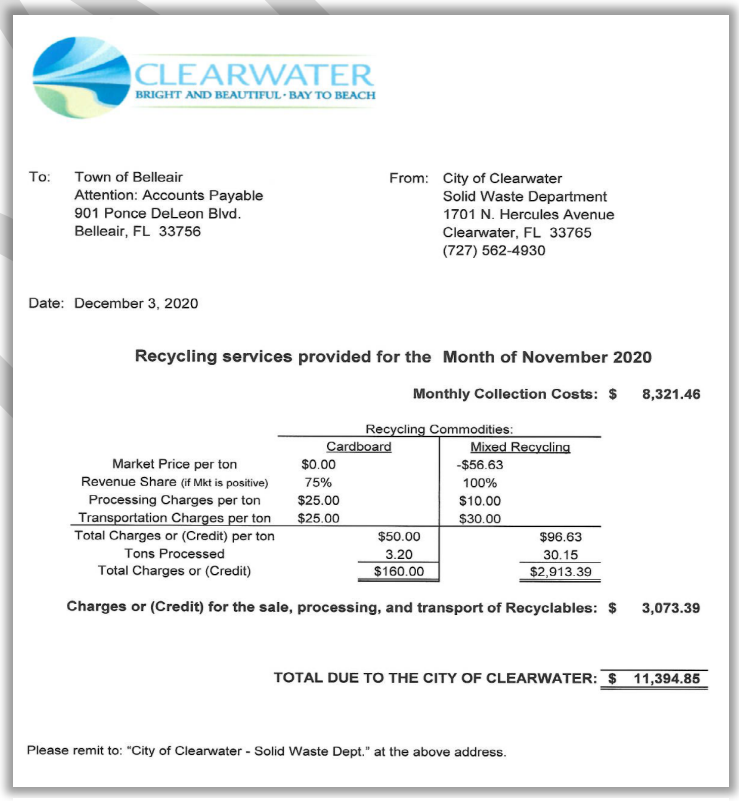
Clearwater's collection and processing contract of recyclable material is paid for monthly and includes collection of all recycling in the Town, including materials at multi-family residential complexes. The material is then processed at the Clearwater recycling facility. This analysis will review the cost implications of two scenarios for the Town to consider in continuing to provide curbside recycling service. This includes performing the service in-house with the purchase of an ASL truck to perform the service, and the same option but with the rental of the same vehicle.

KCI also reviewed additional options for outsourcing this service through contracting with other municipalities, as well as the use of a private contractor. The only other potential municipality that could be utilized was the City of Largo, who was unable to take on the additional services at that time. Due to the relative size of the service being small, private contractors would not seek to take on this service.

3.1 Current Service – Clearwater Collection

The City of Clearwater charges the Town for collection based upon their cost per unit for the same service within their city limits plus 25%. This monthly cost is charged in aggregate and invoiced on a monthly basis - currently $8,321.46 per month as illustrated in the top portion of Figure 4.

This monthly cost is projected to go up roughly 3.5% per year based upon a Rate Study performed and implemented by Clearwater. The following table represents the cost projections of utilizing Clearwater as the primary recycling collector and processor for the next four years.



CLEARWATER
BRIGHT AND BEAUTIFUL · BAY TO BEACH

To: Town of Belleair
Attention: Accounts Payable
901 Ponce DeLeon Blvd.
Belleair, FL 33756

From: City of Clearwater
Solid Waste Department
1701 N. Hercules Avenue
Clearwater, FL 33765
(727) 562-4930

Date: December 3, 2020

Recycling services provided for the Month of November 2020

Monthly Collection Costs: $ 8,321.46

	Recycling Commodities: Cardboard	Mixed Recycling
Market Price per ton	$0.00	-$56.63
Revenue Share (if Mkt is positive)	75%	100%
Processing Charges per ton	$25.00	$10.00
Transportation Charges per ton	$25.00	$30.00
Total Charges or (Credit) per ton	$50.00	$96.63
Tons Processed	3.20	30.15
Total Charges or (Credit)	$160.00	$2,913.39

Charges or (Credit) for the sale, processing, and transport of Recyclables: $ 3,073.39

TOTAL DUE TO THE CITY OF CLEARWATER: $ 11,394.85

Please remit to: "City of Clearwater - Solid Waste Dept." at the above address.

Figure 4: Example Invoice from City of Clearwater

Table 1: City of Clearwater Recycling Cost Projections

Year	2021	2022	2023	2024
Monthly Collection Cost	$8,321.46	$8,637.33	$8,956.78	$9,294.93
Total Annual Cost:	**$99,857.52**	**$103,647.96**	**$107,481.36**	**$111,539.16**

3.2 Cost for In-House Service with Truck Rental

Since there was no interest from other outsourcing options, KCI reviewed two options for in-house provision of this service. The first being the rental of an ASL for use by a driver or operator employed by the Town and performing the service on a once-a-week basis.

KCI first reviewed potential rental options for ASLs in the market. Currently, due to the pandemic, ASLs have become very difficult to procure, which has impacted their rental options as well. To rent a vehicle like this requires commitment of entire months of use, as opposed to single days, specific weeks, or other time measurements as is normal for the rental of a vehicle in the open market. There is no current provision for the rental of a vehicle for a single or potentially multiple days out of each week. This limits the ability for the Town to accomplish savings for this purpose.

KCI was able to find two companies that currently rent out ASLs: Premier Truck in Cleveland, OH, and Big Truck Rentals in Tampa, FL. The price for rental of these trucks ranged from $8,300 - $8,600 per four-week period. Big Truck Rentals in Tampa quoted $8,600 per four-week period, and due to their proximity, were used as the basis of an analysis to determine the cost utilizing this rental method.

Rental rates of heavy machinery such as ASLs does not include the costs of maintenance, upkeep, and fuel to maintain the vehicle while in their use. As such, expectations for additional costs for maintenance were included into this cost model to determine their impacts.

This scenario (in Table 2 below) assumed the need for one additional solid waste driver position to operate the vehicle, the additional operations & maintenance (O&M) costs associated with owning an ASL, and the same processing costs utilizing Clearwater as the Town's processing vendor.

Table 2: Cost of Providing Curbside Recycling In-House, with a Truck Rental

Year	2021	2022	2023	2024
Truck Rental	$102,500.00	$106,600.00	$110,864.00	$115,298.56
Personnel	$46,577.70	$48,906.59	$51,351.91	$53,919.51
O&M Costs	$16,001.71	$16,481.76	$16,976.21	$17,485.50
Fuel	$16,369.27	$17,024.04	$17,705.01	$18,413.21
Total Annual Cost	**$181,448.68**	**$189,012.39**	**$196,897.13**	**$205,116.78**

This scenario imposes annual costs per year higher than the current services from Clearwater, therefore will not be considered further.

3.3 Cost for In-House Service with Truck Purchase

Using the similar modeling information from the previous scenario, KCI reviewed the potential of another scenario in which the Town would provide services in-house. However, to provide those services, the Town would need to make the capital investment in an ASL and own the equipment directly.

In this scenario, the same parameters of the first scenario were used with a revision to the truck data, and in this case, would include the entire capital purchase of a new ASL in the first year. Current estimates for an ASL are roughly $291,267 to $325,000. For the purposes of this scenario, KCI utilized the higher end of the range for a more conservative estimate.

Table 3: Cost of Providing Curbside Recycling In-House, with Truck Purchase

Year	2021	2022	2023	2024
Capital Truck Purchase	$325,000.00	$0.00	$0.00	$0.00
Personnel	$46,577.70	$48,906.59	$51,351.91	$53,919.51
O&M Costs	$16,001.71	$16,481.76	$16,976.21	$17,485.50
Fuel	$16,369.27	$17,024.04	$17,705.01	$18,413.21
Total Annual Cost	**$403,948.68**	**$82,412.39**	**$86,033.13**	**$89,818.22**

This scenario shows a lower annual cost to the Town budget in the outyears, however will require a significant initial capital investment to implement. If this amount were annualized for a period of nine (9) years, the annual cost then is more in line with the annual costs of collection service through Clearwater, however due to additional personnel, O&M, and fuel requirements, would exceed current budgetary amounts for collection.

Table 4: Annualized Cost of In-House Service, with Truck Purchase

Year	2021	2022	2023	2024
9 Year Annualization - Truck Purchase	$36,111.11	$37,555.56	$39,057.78	$40,620.09
Personnel	$46,577.70	$48,906.59	$51,351.91	$53,919.51
O&M Costs	$16,001.71	$16,481.76	$16,976.21	$17,485.50
Fuel	$16,369.27	$17,024.04	$17,705.01	$18,413.21
Total Annual Cost	**$115,059.79**	**$119,967.95**	**$125,090.91**	**$130,438.31**

It should be noted that these cost projections do not take into account the following variables:

1. This vehicle would be most likely a replacement for a current REL. The sale of such vehicle would provide a surplus revenue to offset the cost of the new equipment.
2. These costs are based upon the consideration that this vehicle would only be in operation one day out of five per week, which could reduce the personnel impacts needed if this service can be covered by current personnel on the non-primary service day (Wednesday).

3.4 Additional Cost Factors – Best Management Practices

A solid waste agency that employs the use of an ASL needs to be prepared to provide service if vehicles are unable to be used. This requires redundancy of equipment or resources to maintain levels of service to customers. In the case of an ASL, it is a good management practice to maintain a spare for every two to three vehicles used in primary operations. Since this process would employ the use of only one vehicle, it is recommended that when considering converting curbside service to an automated system with ASLs, a second vehicle be purchased to maintain this backup redundancy when conducting operations.

3.5 Findings

In review of the information on Curbside Recycling Analysis, the best option for taking over the service if collection can no longer be performed by Clearwater, is to purchase and operate a new automated side-loader with in-house staff. However, the purchase of a new vehicle and the addition of a driver to perform a once-a-week potential service such as this is a significant investment on behalf of the Town.

The concept of purchasing a second vehicle for redundancy adds to this investment significantly and as such, is best considered when looking at the additional services potentially impacted or improved through automation of all curbside collection (garbage and recycling). As such, the next section of this report reviews the provision of solid waste and recycling collection as a potential automated program and whether efficiencies and reductions in overall service costs could be obtained by the Town.

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Section 4
Residential Automated Service Conversion

Based upon the results of the curbside recycling operations analysis, the Town requested KCI review the costs and operational needs for converting the primary household garbage collection program to automated as well, to determine any potential benefits. This process utilized some of the information developed in Section 3 as well as revisiting data and information from a previous KCI project for the Town in 2013.

4.1 Advantages of Automation

The use of automated collection for curbside pickup has advantages outside the efficiency of operations and the reduction of needed resources. The following table outlines these advantages.

Table 5: Advantages of Automated Service

For the Operation	For the Residents
Improved safety	Convenient and easy
Reduced employee injuries	Safer and more maneuverable
Improved collection efficiency	Higher capacity containers
Increased productivity	Hinged lids contain odors
Preserves aging workforce	Reduced rodent problems
Cleaner neighborhoods	Cleaner neighborhoods
Reduced rodent problems	Eliminates container costs
Helps to limit overages	

The associated disadvantages include limited garbage capacity in carts for residents and the need to store an additional cart on their property. This service would also not be feasible for the current collection of bulky and yard waste materials, which would need to remain as a REL operated service. Finally, the Town would need an education and outreach program to prepare the residents of the Town for the new style of service and the limitations and changes to how they dispose of waste will impact them.

4.2 Routing

KCI updated the routing analysis performed for the Town in 2013 to determine vehicle and driver needs to provide curbside collection service with wheeled carts designed for automated collection. In this analysis, KCI reviewed the amount of stops possible to be performed by each type of vehicle based upon the total households located within the Town's limits. Results are shown in Table 6.

Table 6: Curbside Garbage Collection Routing Analysis

Routing Analysis:	
Current Garbage Routes Per Day:	2
Proposed Routes Per Day (if automated):	1
Total Town Households:	1,379
Total Weekly Stops (2x week pickup):	2,758
Maximum Houses per Day per Truck REL:	600
Maximum Houses per Day per Truck ASL:	1,000
Manual Days of Collection Needed:	4.597
Automated Days of Collection Needed:	2.758

Using this analysis, the current twice a week program of curbside garbage collection with two routes, could be reduced to one route and be performed easily in 3-4 days per week. This would provide service in the same time period with some availability for pick up day modifications to customers. The same vehicle and crew could pick up more than half of the customers in the Town on Monday and Thursday and the other remaining customers on Tuesday and Friday, maintaining twice a week coverage.

4.3 Scheduling of Operations

Using the data provided above, the current system of two routes with two operators for REL garbage and yard waste collection could then be reduced to one ASL route with one operator based upon the following weekly schedule:

Table 7: Weekly Collection Schedule

Weekly Schedule				
Monday	Tuesday	Wednesday	Thursday	Friday
Garbage Collection (1/2 of Town)	Garbage Collection (1/2 of Town)	Recycling Collection (All of Town)	Garbage Collection (1/2 of Town)	Garbage Collection (1/2 of Town)

This schedule is using the concept of half the town being collected on Monday and Thursday for Garbage, the other half on Tuesday and Friday, and performing curbside recycling collection on Wednesday. Based upon historical data from Clearwater, the set-out rate for recycling varies between 40-60%, and therefore can be managed on a single collection day.

Yard and bulky waste collection can then be performed on the same days using the remaining crew with a REL based upon this same collection schedule, as well as associated multi-family and commercial accounts currently being serviced by the Town.

4.4 Associated Costs

In terms of costs associated with curbside collection, the cost for vehicles and crew is also lower to the Town on an annual basis. This is represented in the table below.

Table 8: Annualized Costs of Manual versus Automated Collection per Vehicle

	Current (Manual)	Automated
Labor	$ 139,733	$ 93,155
Equipment	$ 66,000	$ 92,857
Maintenance	$ 30,000	$ 32,003
Fuel	$ 16,236	$ 16,369
Carts	$ -	$ 8,555
	$ 251,969	**$ 242,941**

These costs, which are annualized, represent the savings found from utilizing one operator on a vehicle to perform the curbside collection function. This also represents potential increases in costs due to additional maintenance, higher cost of equipment, and the cost of purchasing and replacing carts on a ten-year cycle.

To transition to an automated service, there are initial costs (that are shown annualized in the Table 8) that the Town would need to incur in the first year to implement the program. These costs are shown in Table 9, along with the surplus revenue from the sale of associated REL vehicles in the Town's fleet.

Table 9: Transition Costs for Automated Service

Automated Transition Plan		
Year 1 - Designate Transition		
Purchase Vehicles (1 Year Lead Time)	$	650,000.00
Purchase Carts (12 Week Lead Time)	$	85,553.16
TOTAL:	$	735,553.16
Year 2 - Implementation		
Surplus Vehicles	$	(200,000.00)
TOTAL INITIAL INVESTMENT:	**$**	**535,553.16**

The estimates used above are the higher end of the range of cost for a current ASL, and current market costs for automation-ready carts. This is due to current demand for ASLs in the market, and the availability of such vehicles being currently lower than in most years.

4.5 Operational Cost Considerations

Using the model set out and analyzed above, the cost implications to the Solid Waste Fund and the program in the Town's budget are significant. In the model above, the Town would maintain its current staffing levels and its current capital fleet inventory amount. These

vehicles (ASLs) however have a higher value than the current RELs and as such will increase cost per purchase for replacement and maintenance. This change would also eliminate the need by the Town to pay for outside collection of recycling materials to a third-party, and would fold the costs and services into the total program provided by the Town. As such, this would eliminate the costs currently being paid to Clearwater for recycling collections and would show savings each year of the program.

Table 10: Return on Investment – Automation

Automated Transition Plan			
	Year 1	Year 2	Year 3
Purchase Vehicles (1 Year Lead Time)	$650,000.00		
Purchase Carts (12 Week Lead Time)	$85,553.16		
Surplus Vehicles		($170,000.00)	
Reduction in Costs for Recycling Service		($99,857.52)	($103,647.96)
Total Investment:	$735,553.16	$465,695.64	$362,047.68

Automated Transition Plan (Cont'd)			
Year 4	Year 5	Year 6	Year 7
($107,481.36)	($111,539.16)	($116,000.73)	($120,640.76)
$254,566.32	$143,027.16	$27,026.43	($93,614.32)

With this transition, the Town would save between $99,000 and $120,000 annually in direct costs for recycling service, and as such would return the initial cost investment of the transition within seven years of the transition.

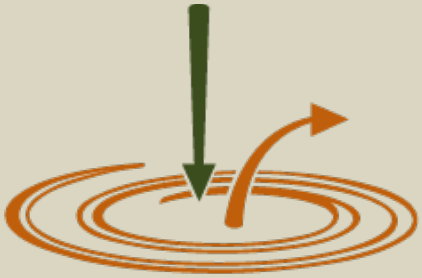
Section 5
Conclusions and Recommendations

The Town currently has an opportunity to streamline their operations without considerable additional personnel or equipment. With the consideration of performing the curbside recycling collection service in-house, and the transition of garbage collection to match this type of collection, the Town could perform all services required without the need for an additional staff person, or an increase to their fleet size.

This would in effect reduce annual costs based upon efficiency of operations while also effectively reducing the annual Solid Waste budget by the costs currently incurred through the contract with Clearwater. By rolling this service into the operations provided, the Town can purchase the two ASLs required to provide curbside service while no longer needing the two rear loaders currently in service for this purpose, keeping the fleet size at four vehicles. This would also keep one vehicle in operation for collection and one as a redundant back up for times when one ASL needs service or maintenance.

This also reduces the need for additional staffing in the immediate future. Due to the ASLs requiring a crew of one instead of two, the current four-person crew utilized by the Town can be designated with one operator for automated collection, one back up operator (who can assist on rear load operations but will primarily fill in to meet service requirements), and two assigned to a rear loader for ancillary collection activities such as Yard Waste and Bulky Waste pickup. This model is effective in managing operations due to potential staffing shortages as well as time off for vacation and sick time.

Based upon projected costs and depending on the Town's financial ability to manage the initial transition costs of new vehicles and carts, this change in service would reduce overall cost for the Town and show a return on the Town's investment in seven years. This transition would also reduce safety concerns for Solid Waste personnel going forward associated with manual solid waste collection and transitioning the Town to a more modern collection system.



kessler consulting inc.

innovative waste solutions