

**Solid Waste Operations Master Plan  
Open Council Meeting  
July 22, 2019**

## **CURBSIDE COLLECTION SERVICE & PROCESSING OF RECYCLABLES**

---

### **INTRODUCTION**

The City of Abbotsford is developing a Solid Waste Operations Master Plan to align with Council's *Strategic Plan*, and to address important opportunities and challenges under the City's solid waste program.

As part of the Master Plan initiative, the City wishes to review its existing curbside collection service, and its ongoing use of the Abbotsford-Mission Recycling Depot (AMRD) as a processing facility for recyclables. More specifically, the City wishes to examine:

- different methods of curbside collection available to the City
- alternative curbside collection service models
- the potential to provide separate glass collection and large item pick-up programs
- options available to the City for processing recyclables

This report addresses each of these points, beginning with methods of curbside collection.

### **METHODS OF COLLECTION**

Many municipalities in British Columbia provide curbside collection services to collect all three streams of solid waste, including:

- organics, which consist of food and yard waste
- recyclables, which are comprised primarily of packaging and printed paper materials that are accepted by Recycle BC

- garbage, which captures all residuals that do not fall under one of the other streams

Each of these streams is collected using one of three methods: manual, semi-automated, or fully-automated collection. The methods are described as follows:

- *Manual Collection* — Manual collection requires workers to physically lift receptacles and tip them into vehicles. The method is used across Abbotsford for all three streams of solid waste. City crews deliver the service in West Abbotsford using a combination of single- and dual-load City vehicles. Each vehicle is staffed by a single employee who drives the vehicle, and exits it at each house to lift, tip, and replace containers. In East Abbotsford, service delivery is contracted to Emterra Environmental. Emterra collects the materials using separate single-load vehicles, each of which is staffed by at least two workers including a driver, who remains in the vehicle, and a "swamper" who lifts, tips and replaces the containers.
- *Semi-automated Collection* — This method makes use of hydraulic equipment to lift and tip collection containers into vehicles. Specialized, high-capacity carts for each solid waste stream must be used by residents for this method. Each cart is equipped with a handle to latch onto the lifting system, and with wheels to allow for easy placement curbside.
- *Fully-automated Collection* — The fully-automated method is similar to the semi-automated option in that both require the use

of specialized carts, as well as vehicles equipped with hydraulic lifting equipment. Where the two methods differ is in the role of the employee who drives the vehicle. Under the semi-automated method the driver must leave the vehicle to move the carts into place, and to operate the hydraulic lift. In fully-automated collection, the driver remains in the vehicle and uses a joystick to maneuver hydraulic lifting arms. The lifting arms reach out, take hold of the carts (separately), lift, tip, and replace them. Automated collection is designed specifically to require only one employee per vehicle.

This report assesses the manual and fully-automated collection methods only — semi-automated collection is not examined further. The need in semi-automated systems for staff to repeatedly exit vehicles to handle carts makes the method inefficient compared to the fully-automated alternative.<sup>1</sup>

**ASSESSING THE OPTIONS**

The literature on solid waste collection, and the experiences of municipalities that have shifted collection methods in the past decade, point to a set of factors that help to determine the preferred method for a given municipality. Factors include:

- service cost
- worker safety
- workplace diversity
- collection vehicles
- collection containers
- user preference
- collection frequency

Each of these factors is important to consider and is addressed in this report. The assessment is focused primarily, however, on the factor of service cost — specifically, the total cost associated with the manual and fully-automated methods to provide a three-stream, curbside

collection service to the 26,300 single family households and duplexes in Abbotsford. To isolate the issue of collection method, the assessment assumes a single service area (the entire municipality) and a single service agency (the City of Abbotsford's Sanitation Division). These assumptions, it should be emphasized, are made only to facilitate the cost comparison of methods. The subsequent section of the report on service delivery options will address questions of service area and collection agencies.

**SERVICE COST**

Figure 1 summarizes the costs to the City associated with each of the two methods. As noted in the figure, the annual cost for automated collection is projected to be approximately 8% (\$307,000) less than the cost of the manual method. *Attachment 1* provides details.

The cost assessment of the two methods is based on certain assumptions common to both options. Key assumptions are as follows:

- all new vehicles are powered by compressed natural gas (CNG)
- all vehicles are single-compartment

<b>Cost Component</b>	<b>Option 1 Manual</b>	<b>Option 2 Automated</b>
Vehicles	1,729,148	1,546,846
Receptacles	109,360	497,226
Labour	1,876,247	1,376,953
Overhead	163,449	150,525
<b>Total Annual Cost<sup>1</sup></b>	<b>3,878,204</b>	<b>3,571,550</b>

<sup>1</sup> Cost to provide collection to 26,300 households across the entire City of Abbotsford.

<sup>1</sup> Local governments may choose semi-automated as the preferred option in areas with significant

wildlife (carts with locks can be used), or in attempts to achieve lower levels of contamination.

- estimated maintenance, fuel and insurance costs are based on actual City costs, adjusted to account for vehicle age, truck numbers and fuel type
- staffing costs are based on City wages and benefits, and include a portion of management
- curbside recyclables are collected on an every-other-week (EOW) basis (at present, recycling is collected weekly)

These assumptions are explained in further *Attachment II*.

**Option 1  
Manual Collection Costs**

The total estimated annual cost for the manual method is projected at \$3.88 million, as shown in Figure 1. Key inputs that contribute to this cost are explained as follows:

- *Vehicles* — Fifteen vehicles would be needed to provide for the manual collection of garbage (EOW), recycling (EOW), and organics (weekly) to 26,300 households across Abbotsford. This figure includes two back-up trucks, one of which would be used for service at peak times.

The per-vehicle purchase price of \$334,000 is based on a review of recent CNG collection vehicles by other BC municipalities. The figure takes into account a CNG incentive provided by Fortis BC. Amortized over a seven-year period, the purchase of fifteen vehicles would produce a total annual cost to the City of \$782,900. Additional costs would be incurred to retrofit the City's existing maintenance facility (to accommodate CNG vehicles), as well as for maintenance, fuel, and insurance.

- *Receptacles* — Under the City's existing manual collection, residents are responsible for purchasing their own garbage cans, recycling bags and organics receptacles. The money spent on these items represents real costs that are unique to the manual method.

The costs are not, however, incurred by the City, and are not itemized in *Attachment I*. *Attachment I* does include a figure, however, for blue recycling boxes that will be required to replace the existing single-use blue bags that are being phased-out. The total capital cost to provide two 90- or 120- litre blue boxes, with lids, to each household is amortized to show an annual cost of \$109,400.

- *Labour* — Annual salary and benefit costs, projected at \$1.88 million, include costs associated with fifteen drivers and one exempt manager, a premium paid to two supervisors, and a percentage of Solid Waste management salaries. WorkSafe BC costs attributable to the Sanitation Division are projected at \$200,000 per year, based on a high-level estimate provided by the City's Human Resources Department. Replacement contractors, required under the manual collection method to address injuries and other staffing issues, are estimated at \$330,000 per year.

**Option 2  
Fully-Automated Collection Costs**

The annual cost for automated collection is projected at \$3.57 million. Key inputs are explained as follows:

- *Vehicles* — Twelve vehicles would be required to provide automated collection for all three streams across the City. Based on a review of similar services elsewhere, it is projected that at least ten of the vehicles would be needed at all times; up to two of the vehicles would be in place as back-up.

The purchase price for each vehicle is set at \$400,000, based on a review of recent purchases elsewhere, in particular the City of Nanaimo. The cost includes two spare lift-arms, all necessary radio frequency identification (RFID) equipment,<sup>2</sup> and the Fortis CNG incentive. Amortized over seven

---

<sup>2</sup> RFID equipment allows the provider to monitor delivery, and link cases of cart contamination to individual households.

years, the total annual cost for all vehicles is \$748,000. Maintenance facility retrofitting costs, and costs related to maintenance, fuel, and insurance are also included.

- *Receptacles* — In a fully-automated system, households are given one cart for each solid waste stream — three carts per household in total. For the City as a whole, 80,750 carts would be needed at total capital cost of \$4.88 million.<sup>3</sup> When amortized over twelve years the cost is \$478,000 per year.
- *Labour* — Salary and benefit costs associated with twelve drivers and one exempt manager are included in a total labour cost of \$1.38 million. WorkSafe BC costs attributable to waste collection, estimated at 20% of the cost under manual collection (worker injury rates are far lower in automated systems), are also included, as are costs for a Cart Administrator and part-time quality control staff to assist the community in achieving low levels of recycling contamination.<sup>4</sup>

**OTHER FACTORS**

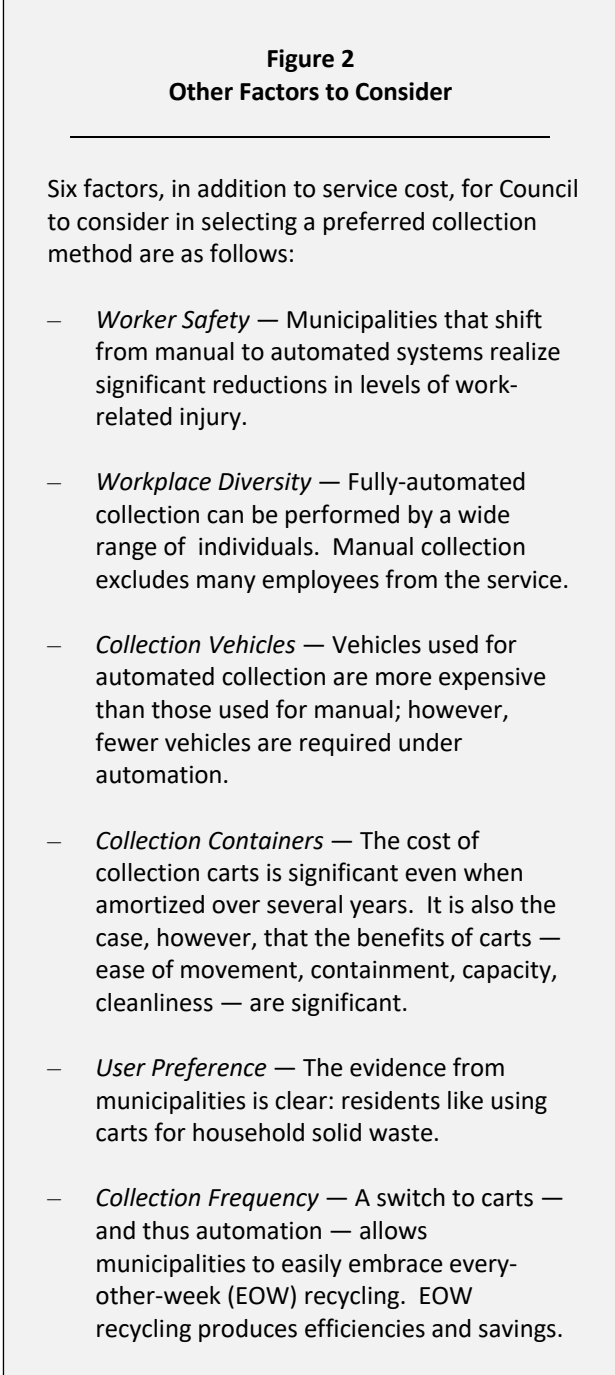
Service cost may be the key factor for Council to consider when selecting the preferred collection method. The other factors identified earlier in the paper, however, are also important to consider. These factors are presented in Figure 2.

**RECOMMENDATIONS**

The report has compared manual and fully-automated curbside collection methods. The comparison has focused on service cost as the principal assessment factor; other factors, however, have also been noted. In all, the comparison points to fully-automated collection as the preferred method for the City of Abbotsford.

Based on this conclusion, the following recommendations are provided for Council's consideration:

<sup>3</sup> The average cart is estimated at \$60 based on recent purchases in Nanaimo. A cost of \$200 per cart for 244 bear-resistant carts is included.



- *THAT Council approve fully-automated collection for all three solid waste streams as the preferred collection method for the City of Abbotsford; and*

<sup>4</sup> *Attachment III* addresses the issue of recycling contamination in fully-automated systems.

- *THAT Council approve every-other-week curbside recycling pick-up, using fully-automated collection, as the preferred collection frequency for recyclables for the City of Abbotsford.*

## SERVICE DELIVERY

This section of the report examines the service delivery models available to the City in its residential curbside collection service.<sup>5</sup> The text begins by describing specific models to examine, including one that expands on the hybrid approach in place in Abbotsford today. The costs associated with each model are included in the descriptions. The optional models are then considered against a set of evaluation criteria.

### SERVICE DELIVERY MODELS

There are numerous possible service models and combinations of models available to the City. The following three are evaluated here:

- hybrid delivery model
- City delivery model
- contract hauler delivery model

### Service Costs

Figure 3 summarizes the cost to the City under each of the three service models; a more detailed breakdown is provided in *Attachment IV*. For all models, costs are divided between those attributable to the City's own delivery, and those attributable to delivery by a contract hauler. All cost entries are based, where possible, on costs incurred by the City today. Costs for items not incurred by Abbotsford at present — e.g., the cost of carts — are based on comparative research.

The cost comparison is based on a number of assumptions that apply

to all three models. The key assumptions are as follows:

- cost estimates are based on the existing customer base of 26,300 households
- investments in equipment and other capital are amortized (straight-line) to identify annual costs expected
- all three solid waste streams are collected using CNG vehicles, outfitted for fully-automated collection
- all households on the system are provided with three large (e.g., 240 litre) carts, one for each waste stream
- all carts are purchased, owned and administered by the City
- organics are collected weekly; recyclables and garbage are collected EOW on alternating weeks
- Recycle BC payments are equal under all options (revenues are not listed under the models)

### MODEL 1

#### HYBRID DELIVERY MODEL

This model, similar to the system in place today, features the use of two service zones, as well as a division of responsibility for service delivery between a contract hauler (East Abbotsford) and City crews (West Abbotsford). Other features of this model are as follows:

- Both the contract hauler and City would use

<b>Figure 3</b>			
<b>Summary Comparison of Service Delivery Models</b>			
	<b><u>Hybrid</u></b>	<b><u>City Delivery</u></b>	<b><u>Contract</u></b>
City of Abbotsford	2,290,508	3,541,075	715,375
Contract Hauler	1,113,828	-	2,305,028
<b>Total</b>	<b><u>3,404,335</u></b>	<b><u>3,541,075</u></b>	<b><u>3,020,404</u></b>

<sup>5</sup> For the purpose of the report, "service delivery" refers to the agency — or agencies — used by

municipalities to collect curbside materials, as well as the number of service areas.

side-loading collection vehicles operated by a single worker, and outfitted for fully-automated collection.

- The City would purchase six new CNG vehicles as the full fleet for West Abbotsford. Five trucks would be used to operate each day; one would be in place as back-up, but could be used as a sixth truck if required. This arrangement assumes that each truck would be able to collect, on average 1,000 bins per shift.
- City vehicles would be refueled at a local CNG station, either at the City's own Works Yard, or at a nearby third party site. The cost of fuel is projected at \$0.75 per diesel litre equivalent (DLE) at both.
- The City's maintenance facility would be retrofitted, and staff retrained, to enable maintenance of the City's new CNG vehicles. Fortis BC grants would offset a portion of the capital cost. The contractor would maintain its own trucks.
- The City would purchase route planning software to maximize collection efficiency in West Abbotsford.
- The agreement with the contract hauler for East Abbotsford would be set for seven years to match the lifespan of new vehicles.

#### Hybrid Model Cost Estimate

Attachment IV provides an itemized account of the estimated \$3.40 million total cost of the hybrid model. The following points highlight specific items that would be incurred by the City:

- *Vehicles* — The City's six new, CNG-powered trucks would cost \$400,000 per unit with the inclusion of a (small) Fortis BC grant. Amortized over seven years, the annual cost for all six vehicles would be \$375,000.

- *Facility* — The capital cost to retrofit the City's maintenance facility is estimated at \$1.0 million, net of Fortis BC incentives. This investment, which would be spread over fourteen years, is based on figures provided to the City as part of its *Green Fleets* initiative.
- *Collection Carts* — The total cost to the City to acquire, assemble and deliver three carts to each household across the entire City is estimated at \$5.05 million. Amortized over twelve years, this investment translates into an annual cost of \$497,000.
- *Labour* — Labour costs reflect the number of vehicles purchased for the West Abbotsford service area, as well as the need for a Cart Administrator and part-time workers to perform collection quality control.

The annual cost to the City to retain a contract hauler for the East Abbotsford service area is estimated at \$1.11 million. This estimate is based on industry-projected costs for 2018, submitted to the City in 2012, to operate a fully-automated service with weekly organics and EOW recycling and garbage in East Abbotsford. The industry-projected cost has been adjusted to take into account the actual number of households in East Abbotsford in 2018, as well as inflation adjustments over-and-above those that were incorporated into the original submissions.<sup>6</sup>

#### MODEL 2

##### CITY DELIVERY MODEL

Under this model, City crews would deliver the collection service across the entire City. Twelve new, CNG-powered vehicles, capable of fully-automated collection, would be purchased to provide the capacity necessary. Ten of the trucks would be needed each day. The eleventh vehicle may be needed on some days; however, for at least half of the time it would be held in reserve for back-up use. The twelfth vehicle would be held for back-up at all times.

---

<sup>6</sup> Efforts have been made to scrutinize and adjust the industry projection on which the cost estimate is based. The information, however, is dated

(2012). The estimate should, therefore, be treated with some caution. A formal RFP would be needed to develop a more precise contractor cost.

As under the hybrid model, the city would refuel its CNG vehicles at a local fueling station. The City's maintenance facility would be retrofitted, and staff trained, to provide maintenance. All collection routes would be reviewed for maximum efficiency using route planning software.

### **City Delivery Model Cost Estimate**

Most costs related to City vehicles are double those identified under the hybrid model. An exception is the retrofit of the City's maintenance facility. The \$1.0 million capital investment identified earlier would be the same under both models.

Labour-related costs are also double those of the hybrid model in most instances. Costs required for cart administration and collection quality control programs, however, are constant across all service models.

The City model does not include any involvement by a contract hauler. The total cost of the model is estimated at \$3.54 million. It is itemized in *Attachment IV*.

### **MODEL 3**

#### **CONTRACT HAULER MODEL**

Under the contract hauler delivery model, the City would outsource service delivery for all streams across the entire community to a single contractor. The term of contract would be seven years; pricing terms would be fixed for that period.

It is expected that the contractor would review all existing routes and, using specialized routing software, merge the existing service areas in a way that maximized route efficiency. Potential route efficiencies are not factored into this assessment.

#### **Contract Hauler Model Cost Estimate**

Under the contract model, similar to the others, the city would incur costs related to the purchase, assembly, delivery, and administration of the collection carts. The cost for collection quality control would also be incurred separately by the

City. All other costs, however, would be included in the agreement with the contract hauler.

The contractor cost uses the information from the 2012 submission, identified earlier, with adjustments to reflect:

- the addition of West Abbotsford to the East Abbotsford service area
- the 2018 number of households across the City
- the per household collection cost in 2018
- an additional inflation factor<sup>7</sup>

The total estimated cost of \$3.02 million for this delivery model is itemized in *Attachment IV*.

### **EVALUATION CRITERIA**

Service cost is a key factor in selecting a preferred service model. It is not, however, the only factor to consider. In all, Council may wish to assess the options against a range of criteria, including:

- *Relative Cost* — The preferred model must be cost-effective relative to the alternatives.
- *Feasibility* — The approach to service delivery identified in each model must be feasible to develop and implement. For models with some level of contractor involvement, one test of feasibility will be the ability to attract a sufficient number of qualified bidders to a competitive request for proposals process.
- *Cost Stability* — The preferred delivery model will offer a high degree of assurance regarding the stability of costs in future years.
- *Service Continuity* — The preferred model will provide uninterrupted service.
- *Public Acceptability* — The preferred model will be acceptable to users throughout the City, some of whom have experience with a private hauler, and some of whom are accustomed to delivery by the City.

---

<sup>7</sup> As noted earlier, the information on which the estimate is based is dated; as such, the estimate should be treated with some caution. A formal

request for proposals would be needed to develop a more precise contractor cost figure.

- *Flexibility* — The preferred service model will be flexible enough to respond to demands for service by new user groups, and to the service needs of specific populations and areas.
- *Simplicity* — The preferred model will be relatively simple for users to understand, and straightforward for the City to administer.
- *Control* — The preferred model will provide the City with an adequate degree of control.
- *Staffing Considerations* — The preferred model will enable the City to approach service delivery in a way that balances the City's desire to be an employer of choice, with its equally strong desire to maximize cost-effectiveness on behalf of ratepayers.

Figure 4 evaluates the three service delivery models against the criteria. The figure uses a set of symbols to rate the preferred model under each criterion.

## RECOMMENDATIONS

The report has identified and assessed three possible service delivery models for the City to consider in its residential curbside collection service. The contract hauler model earns the highest number of "preferred" scores in the assessment, including on the measure of "relative cost". On the important "staffing considerations" measure, however, this model rates as the least preferred.

With respect to cost, it should be emphasized that the estimate put forward for the contract hauler model is based on many assumptions, particularly regarding private haulers' ability and/or willingness to deliver the service at a cost that is similar to that which was projected in submissions to the City in 2012. Small changes to the assumptions could either widen or shrink the cost advantage identified for this model.

The "staffing considerations" measure is a particularly important criterion. It speaks to the City's important role as an employer, and its desire to be viewed as an employer of choice.

**Figure 4**  
**Evaluation of Service Delivery Models**

Evaluation Criteria	Delivery Model		
	Hybrid	City Delivery	Contract Hauler
Relative Cost	●	○	●
Feasibility (Implementation)	●	●	●
Cost Stability	●	●	●
Service Continuity	●	●	●
Public Acceptability	●	●	●
Flexibility	●	●	●
Simplicity (Administration and Use)	○	●	●
Control	●	●	●
Staffing Considerations	●	●	○

● Preferred Model      ● Mid-Rated Model      ○ Least Preferred Model



These two criteria — "relative cost" and "staffing considerations" — are best addressed under the hybrid model. Based on this finding, the following recommendation is presented to Council for consideration:

- *THAT Council endorse the Hybrid Delivery Model as the preferred curbside collection service delivery model for the City of Abbotsford.*

## GLASS & LARGE ITEM PICK-UP

### CURBSIDE GLASS COLLECTION

Co-mingling of glass in recycling collection containers with other recyclables is no longer permitted under the Recycle BC program. Municipalities that wish to collect glass from residents must offer and fund a separate glass collection program. Several municipalities, including Chilliwack and Mission in the Fraser Valley, have chosen to provide such a program.

#### Separate Program

A separate glass program for Abbotsford could be structured in a number of different ways, using different types of collection vehicles, delivery agencies, and collection frequencies. For the purpose of this report, a program with the following characteristics is envisioned:

- *Manual Collection* — Fully-automated collection of glass is not a realistic option. The program would, therefore, feature manual lifting and tipping of (small) containers.
- *Containers* — Residents would be issued one 53 litre grey box. All boxes would be purchased and owned by the City.
- *Monthly* — The program would collect glass from all 26,300 households once per month.<sup>8</sup> The relatively small volume of glass anticipated (315 tonnes per year) makes monthly collection possible.<sup>9</sup>

<sup>8</sup> The City of Port Moody offers monthly service. Some other places collect twice per month.

- *Vehicles* — Two dedicated single-axel, small-haul CNG collection trucks would be required to collect glass across the entire City. Each truck would be staffed with one person.
- *Contract Hauler* — The service would be contracted across the entire City to one hauler.

#### Estimated Cost

Early calculations show that the estimated cost of the separate glass collection program would be \$317,000 per year for the City as a whole (i.e., both service areas). This figure is net of revenues that would be paid to the City by Green by Nature (Recycle BC's current post-collection service provider) for the glass once collected.

#### LARGE ITEM PICK-UP

A number of municipalities offer programs through which households may place large items (e.g., appliances, furniture, mattresses) curbside for collection and disposal. Some programs are provided through the solid waste collection service, and are funded by solid waste user fees. Other programs charge users separately on a fee-for-service basis. The number of items, and the frequency of collection, vary considerably across municipalities with programs in place.

In Abbotsford, the City held spring and fall clean-up events annually until 1997. Under this program, residents were invited at specified times to place material curbside for pick-up and disposal. The events were discontinued in part because of cost, but also because of concerns regarding unsightly conditions, the potential for scavenging, and other considerations.

#### Separate Program

The City continues to receive requests from residents for some new type of clean-up or large item pick-up service, comparable to those offered in some other places. In response to these requests, the City is exploring the potential to develop a program that would offer each household in the curbside collection service the

<sup>9</sup> This tonnage translates into an average of 1 kg of glass per household per month.

ability to have one large item collected at any one time during the year.

#### **Estimated Cost**

Early calculations point to an estimated annual cost to provide this service of approximately \$330,000 for the program.

#### **RECOMMENDATIONS**

Based on the desire for these two additional programs, and the results of the early calculations, the following recommendations are provided for Council's consideration:

- *THAT Council direct staff to request pricing from the market for monthly glass collection and large item pick-up service for the City's solid waste program; and*
- *THAT Council direct staff to report back to Council with a recommendation on these services based on actual costs and user fee impacts.*

### **PROCESSING OF RECYCLABLES**

The Abbotsford-Mission Recycling Depot receives and processes residential curbside recyclables, along with recyclables from other sources, for the City of Abbotsford and District of Mission. The depot was constructed in 1989 at a site on Valley Road owned by the City of Abbotsford. The building itself and the equipment within it are jointly-owned and maintained by the City and the District, pursuant to the terms of a 2011 inter-municipal *Joint Recycling Services Agreement*.

The AMRD is operated on the municipalities' behalf by Archway Community Services (ACS), a non-profit community agency.<sup>10</sup> ACS' involvement as the operator dates back to the facility's inception. The agency's current scope of responsibilities is outlined in and governed by a 2011 *Recycling Services Agreement* with the two municipalities.

---

<sup>10</sup> The society was formerly known as Abbotsford Community Services.

Both the *Recycling Services Agreement* and the inter-municipal *Joint Recycling Services Agreement* were extended at the end of 2015 and 2016, and remain in effect today.

Abbotsford could pursue additional extensions to its agreements with Mission and ACS, and could continue to rely on the AMRD in its current form as the City's receiving and processing facility. The current arrangement, however, is becoming cost prohibitive. Since 2012, net costs paid by the City each year to support the AMRD have escalated from \$465,000 to \$1.35 million.

Recycling has evolved to become a major industry dominated by large, specialized firms. Processing depots today are sophisticated, capital-intensive, technology-driven operations with significant economies of scale and large service areas. Net costs are dependent, to a large degree, on the volumes of material that can be directed to a facility, on the ability of the operator to minimize operating expenses, and on the ability of the operator to successfully sell in international markets any materials not covered by Recycle BC. Many municipalities have chosen to "leave the field" and rely on the private sector to handle their recyclables. This trend, combined with the challenges facing the City under its current approach, has prompted Abbotsford to consider other receiving and processing options.

#### **OPTIONS TO CONSIDER**

Three future possible options are put forward in this section of the report, including:

- a Pre-Conditioning Facility (PCF) Option that would extend the role of the AMRD as a receiving and processing facility for all recyclables
- a Transfer Station Option that would convert the AMRD to a transfer station for curbside recyclables, and streamline the scope of remaining services available at the facility

- a Drop-off Facility Option that would convert the AMRD to a residential drop-off depot, and require curbside recyclables to be delivered directly by recycling collection vehicles to a GBN pre-conditioning facility in a neighbouring municipality

The text begins with a review of the current model. Each of the options is then outlined, and is assessed using a set of evaluation criteria.

### Choice of Options

Every effort has been made to design practicable, realistic future options that complement the City's curbside recycling program, and that meet the broader recycling needs of residents, businesses and others in the municipality. Efforts have been made, as well, to present options that are distinct from one another, and that together represent a broad range of possible service models. It needs to be recognized, however, that the total number of possible options available to the City is considerable. Different service providers that wish to work with Abbotsford may be able to develop models that weave together service components in cost-effective ways that the City is unable to create on its own. For that reason, it is recommended later in the report that the City "test the market" through a competitive process, before determining the municipality's ultimate course of action.

### CURRENT MODEL

Under the Recycle BC program, all eligible packaging and printed paper (in-scope PPP) collected from residents must be delivered for processing to a designated pre-conditioning facility. Green by Nature (GBN) is the company that is currently contracted by Recycle BC to provide a network of such facilities across the province. All of the facilities in GBN's current network are owned and operated by third parties (i.e., sub-contractors), almost all of which are private companies that specialize in recycling waste management. GBN pays the operators to receive and process Recycle BC materials, and to prepare them for transport. GBN is responsible for transporting the materials from the pre-conditioning facilities to end markets, or to GBN's processing centre in New Westminster.

The City of Abbotsford joined Recycle BC in early 2017. Curbside recyclables collected by the City and its contractor, Emterra, are delivered to the AMRD for processing. The District of Mission also joined Recycle BC in 2017. Mission's curbside recyclables are delivered by its contractor to the AMRD for processing. When the municipalities joined Recycle BC, the AMRD was designated as a pre-conditioning facility under a *Post-Collection Service Provision Contract* with GBN that remains in effect today.

In addition to its role in receiving and processing curbside materials from Abbotsford and Mission, the AMRD receives, processes and markets recyclables from non-residential (ICI) sources, as well as from multi-family residential buildings. The AMRD receives no payment from GBN or Recycle BC for receiving or processing these materials. Instead, the AMRD charges haulers of these materials a tipping fee and receives revenues from selling the materials in international markets.

The facility is also home to a recycling drop-off depot. Residents of Abbotsford, pursuant to a separate Statement of Work (SOW) agreement between the City and Recycle BC, may take in-scope PPP materials to the drop-off bins. Materials are sorted at the time of drop-off by residents, are prepared for transport by AMRD, and are collected by GBN (at the expense of Recycle BC). Businesses and other non-residential users may use the drop-off facility and avoid paying the tipping fee, but only for small loads under 20 kg. Materials dropped by non-residential users must be kept separate from the residential materials, and are the responsibility of the AMRD.

Households in the District of Mission have the option to drop-off recyclables at the Mission Recycling Depot, or at the Mission Landfill. ACS, pursuant to its service contract with the municipalities, transports the materials from these locations to the AMRD for baling and/or transfer to Recycle BC.

The drop-off depot at the AMRD and the Mission Recycling Depot accept materials that are part of Extended Producer Responsibility (EPR) programs.

Such materials include batteries, appliances, toilets, used cooking oil, cell phones, books, clothing, light bulbs, electronic waste, and household hazardous wastes.

Finally, the AMRD is home to a small recycling education centre that school groups and others can visit to learn about the recycling process.

#### **Net Cost**

The total 2018 net cost for the AMRD under the existing arrangement was \$1.89 million, including \$215,000 in capital. In accordance with the cost-sharing model in place between Abbotsford and Mission, the City's share of the total net cost was \$1.53 million (including annual capital).

#### **PRE-CONDITIONING FACILITY OPTION**

The PCF Option is in many respects an extension of the existing service arrangement. Consider the following points:

- The AMRD's current status as a designated, GBN pre-conditioning facility would be extended. All curbside Recycle BC materials from Abbotsford would be received and processed at the AMRD. As at present, GBN would pay a per-tonne fee to the AMRD to receive and process these recyclables.
- ICI materials would continue to be received, processed and marketed at the facility. Revenues from the ICI sectors would come in the form of tipping fees paid by haulers to the AMRD directly, and sales of ICI materials by the operator.
- A drop-off depot for residents would continue to be provided at the AMRD, and at the Mission Recycling Depot. Through a renewed Statement of Work, Recycle BC would pay the AMRD to receive and hold these materials. Non-Recycle BC materials would be held by the AMRD for pick-up by firms contracted under different EPR programs.
- School groups and others would have use of the on-site education centre.

Unlike the *status quo*, the PCF Option does not

assume that ACS would continue to run the facility. The option assumes, instead, that the choice of operator would be determined through a competitive process that would be open to a variety of qualified agencies, including ACS. The City would negotiate a fixed-term, fixed-payment contract with the preferred candidate. Net-cost increases under the contract would be the responsibility of the operator — a requirement that would represent an improvement over the existing contract with ACS under which the municipalities are responsible for all net-cost overruns.

#### **Projected Net Cost**

All costs and revenues identified for the PCF Option are presented in Figure 5. In reviewing the numbers, it is important to note that the PCF estimate is based on the financial performance of the AMRD at present under the operation of ACS. The reliance on ACS data may appear to conflict with the approach regarding choice of a future operator. The facility's performance under ACS, however, is the only source of data available for the assessment. The other GBN pre-conditioning facilities and most of the larger full-service recycling depots in the province are operated by private contractors. Information on staffing levels, operating costs and service fees generated by these contractors is not publicly available. As well, given the different range of services provided in each facility, and the different volumes processed, the financial data would be of limited value even if they were available.

Annual revenues earned under the PCF Option would include payments from GBN to receive and process curbside recyclables, and payments from Recycle BC to receive drop-off, In-scope PPP. Revenues would also include tipping fee payments to AMRD from ICI haulers, and the earnings from the sale of ICI recyclables. In all, revenues would total \$1.26 million, as indicated in Figure 5.

Annual expenses to consider under the option relate to labour, operations and maintenance, the disposal of residuals that are removed from the recycling stream, and administration. Also included would be an annual contribution to

capital to improve the facility, and to address ongoing equipment needs. Total expenses would be \$3.09 million, for an annual net cost of \$1.83 million. Abbotsford's portion of this amount would be \$1.48 million (81.06% of the total).

**TRANSFER STATION OPTION**

Under this option the breadth of services provided at the AMRD today would be revised. In essence, the facility would be converted to a transfer station for curbside materials, and a drop-off facility for residents. The following points speak to the option's features:

- The AMRD's status as a GBN pre-conditioning

facility would not be extended. Curbside materials collected under the Recycle BC program would continue to be received at the facility; however, they would not be processed for pick-up by GBN. Instead, all municipal curbside materials received at the AMRD would be transferred to large hauler trucks and transported, at the municipalities' expense, to a nearby GBN facility for processing.<sup>11</sup>

- The AMRD would no longer receive ICI materials. Haulers would be expected to take materials to other Fraser Valley facilities.<sup>12</sup>
- The drop-off depot at the AMRD would be

**Figure 5  
Net Annual Cost Comparison of Processing Options  
(Costs and Revenues based on AMRD financial data under ACS operation)**

	Processing Options		
	Pre-Conditioning	Transfer Station	Drop-off Facility
<b>ANNUAL REVENUES</b>			
Green by Nature	829,500	-	-
Other Revenues	433,000	75,000	47,000
<b>Total Annual Revenues</b>	<b>1,262,500</b>	<b>75,000</b>	<b>47,000</b>
<b>ANNUAL EXPENSES</b>			
Labour (wages and benefits)	1,842,000	450,000	225,000
Operations and Maintenance	630,000	191,300	127,000
Handling of Residuals	273,500	9,000	5,600
Administration and Education	133,000	45,000	30,000
Transport of Recyclables	-	235,000	423,000
Capital Improvement Program	215,000	140,000	60,000
Transfer Station Improvement	-	26,000	-
<b>Total Annual Expenses</b>	<b>3,093,500</b>	<b>1,096,300</b>	<b>870,600</b>
<b>NET ANNUAL COST</b>	<b>(1,831,000)</b>	<b>(1,021,300)</b>	<b>(823,600)</b>
<b>CITY OF ABBOTSFORD PORTION (81.06%)</b>	<b>(1,484,209)</b>	<b>(827,866)</b>	<b>(823,600)</b>

<sup>11</sup> The destination would be the decision of GBN, but would almost certainly be Emterra's facility in Chilliwack, or its facility in South Surrey.

<sup>12</sup> Haulers of ICI materials re-directed a considerable volume of materials from the AMRD when the facility imposed a tipping fee in 2016.

retained to receive in-scope, residential PPP materials delivered by residents. Residents would also be able to drop-off the same range of EPR materials as today.

- The drop-off facilities would not accommodate any materials from ICI sources. Businesses and other non-residential users would be expected to take small loads elsewhere.
- The on-site education centre at the AMRD would be retained, as would the programs that are provided by centre staff.
- The District of Mission would deliver its curbside materials to the AMRD for transfer with Abbotsford's materials elsewhere. The Mission Recycling Depot would be operated as part of the AMRD service arrangement.

As with the PCF Option, the choice of operator for the Transfer Station Option would be determined through a competitive RFP process (the existing operator, ACS, would be invited to participate in this process). A fixed-term, fixed-payment contract would be negotiated by the municipalities with the preferred candidate. Unanticipated net-cost increases under the new contract would be the responsibility of the operator.

### **Projected Net Cost**

The revenue and expense projections for the Transfer Station Option are informed both by the financial performance of the AMRD's current operator (ACS), and the experiences of other local governments. All financial information is presented in Figure 5.

Revenues under the Transfer Station Option would be limited to the payment each year from Recycle BC — \$65,000 — and minor revenues of \$10,000 associated with EPR rebates. No payments would be received from GBN. As well, no ICI tipping fees

or sales revenues from ICI materials would be generated.

Annual expenses under the Transfer Station Option would also be reduced significantly from the PCF Option. Staff would be required under the Transfer Station Option to monitor drop-off areas, transfer curbside recyclables into large transport bins for hauling, and deliver education programs.<sup>13</sup> Lower levels of activity at the facility would result in lower costs for operations and maintenance, residuals handling, and administration.

A new cost would be incurred to transport materials to a GBN pre-conditioning facility outside of Abbotsford. An additional new cost would be incurred for improvements to the facility designed to facilitate the transfer of curbside materials to large transport trucks.<sup>14</sup>

In all, the Transfer Station Option would have annual revenues of \$75,000, annual costs of \$1.1 million, and annual net costs of \$1.02 million. Abbotsford's portion of this net cost would be \$828,000.

### **DROP-OFF FACILITY OPTION**

The following points describe the key elements of the Drop-off Facility Option:

- The AMRD would continue to offer a full-service, residential drop-off facility and associated recycling education centre.
- The AMRD's current status as a GBN pre-conditioning facility would not be extended. Moreover, the AMRD would not process any residential curbside recyclables, nor would it receive any curbside materials for transfer to large hauler trucks and transport to a nearby GBN processing centre. Instead, all curbside materials collected under the City's curbside collection program would be taken directly by collection vehicles, at the City's expense, to a

---

<sup>13</sup> It is assumed in the option that the drop-off depots at the AMRD and Mission Recycling Centre would continue to operate using AMRD staff seven days per week.

<sup>14</sup> The cost in Figure 5 is the annual portion of a large amortized capital investment. Further work is required to set a more definitive cost.

GBN Pre-Conditioning Facility in a neighbouring municipality.<sup>15</sup>

- ICI materials would not be received for transfer or processing at the AMRD. ICI haulers would be expected to take their loads to other facilities. Businesses would also not have the option to drop ICI material at the AMRD.
- The choice of AMRD operator would be determined, as in the other two options, through a competitive RFP process.

Similar to the City of Abbotsford, the District of Mission under this option would re-direct its curbside recycling collection vehicles to a GBN processing facility in a neighbouring municipality. The municipalities could continue to jointly provide drop-off depots and the AMRD education centre. For the purposes of this report, however, it is assumed that Mission would withdraw from the AMRD entirely. Each municipality would be responsible for transporting its own curbside materials, operating its own drop-off depot, and providing its own education program.

#### **Projected Net Cost**

The revenues and costs associated with this option reflect existing AMRD operations, but also the experiences at other local government-owned drop-off facilities, and information on collection vehicle costs. All information is shown in Figure 5.

Revenues under the Drop-off Facility Option would include payments each year from Recycle BC, and minor revenues associated with EPR rebates.

Annual expenses would include costs required to run and maintain the drop-off centre, as well as the costs associated with the existing education centre and function. An additional expense, unique to this option, would be the transport of recyclables. Under this option, recycling collection trucks that operate the City's curbside collection program would be required to transport recycling loads to the PCF in a neighbouring municipality instead of the AMRD. These trips would add up to 300 km to

each vehicle's weekly travel total, as well as the cost of fuel. The time taken to travel the extra distance would also reduce the time available for each truck to collect from households, which in turn would reduce the total number of pick-ups achievable per vehicle. To compensate for this loss of availability, it is projected that an additional two collection vehicles, with staff, would be required to serve the City as a whole.

Based on work undertaken on the matter of collection service delivery options (see earlier), the total additional transport costs would be approximately \$423,000. This amount would include annual amortization costs for two additional collection trucks, additional staff to operate the trucks, and extra fuel costs for all vehicles used to collect recyclables.

The total projected annual net cost for the Drop-off Facility Option is \$823,600. This full amount would be incurred by the City of Abbotsford.

#### **SELECTING AN OPTION**

This section of the report assesses the three options against a set of evaluation criteria. Specific criteria are presented in Figure 6. Figure 7 presents the results of the assessment. The figure uses symbols to rate the options under each evaluation criterion. With the exception of the entry for relative cost, all ratings are qualitative.

The cost advantages of the Drop-off Facility Option this model, based on what can be estimated today, elevate this model to the preferred position. This conclusion must be qualified, however, by some important points:

- The difference in projected cost between the Drop-off Facility Option and the Transfer Station Option is extremely modest — less than 1%. The overall cost ranking for the two options could easily change based on even minor adjustments to the City's collection model, or small changes to other assumptions.

---

<sup>15</sup> Formal approval to use the facility would need to be obtained from Recycle BC.

**Figure 6  
Suggested Evaluation Criteria**

<b>Criterion</b>	<b>Description</b>
Relative Cost	The preferred model must be cost-effective relative to others.
Feasibility	The preferred model must be feasible to develop and implement. One test of feasibility will be the ability to attract qualified operators to participate in a competitive process.
Cost Stability	The preferred option will provide for cost stability in future years.
Acceptability	The preferred option will provide recycling options that are acceptable to residents and local businesses, and that will not compromise the level of service currently provided by the City.
Risk	The preferred option will provide greater protection for the City from financial risk than at present.
Social Impact	The preferred option will protect the social benefits realized under the existing arrangement.
Environmental Impact	The preferred option will minimize the impact of the service on greenhouse gas emissions, and will support other environmental policy objectives.
Inter-Municipal Relationship	The preferred model will be supported by the District of Mission, Abbotsford's long-term partner in the AMRD.

- The lack of good, comparative financial data from other processing centres means that the PCF Option was developed based on the costs and revenues reported by the current operator. Other prospective operators may have very different cost and revenue structures.

- The assessment is limited to three options that have been developed without the involvement of for-profit and non-profit recycling agencies. It would be important for the City to test the market to gauge the level of interest in the different service options among qualified firms. The City may find considerable support for some options, but less support for others. In addition, the City may find that some recycling firms are able to refine the options or develop new ones that capitalize on firm-specific factors such as the presence (or absence) of nearby operations, the availability of existing sites, and others.
- The importance placed by the City on the relationship with the District of Mission requires consideration. Any change to the existing facility would impact the District of Mission.

**RECOMMENDATIONS**

The City should consider taking the time to test the interests and ideas of private-sector and non-profit recycling firms that may wish to expand to Abbotsford. The following recommendations speak to this consideration:

- *THAT Council direct staff to work with the District of Mission to develop and issue a first-stage Request for Expression of Interest to gauge the level of interest among qualified third-party entities in the options proposed to receive and process recyclables, and to seek input from qualified firms on additional options for the municipalities to consider; and*
- *THAT Council direct staff to return to Council, following the Request for Expression of Interest process to receive and process recyclables, to advise on next steps.*



**Figure 7  
Assessment of Options**

<b>Evaluation Criteria</b>	<b>PCF Option</b>	<b>Transfer Station</b>	<b>Drop-off</b>
Relative Cost	○	●	○
Feasibility (Implementation)	market to be tested		
Cost Stability	○	●	●
Acceptability	●	○	○
Financial Risk	○	●	○
Social Equity	●	○	○
Environmental Impact	●	○	○
Inter-Municipal Relationship	●	○	○

**SUMMARY OF RECOMMENDATIONS**

This report has presented the findings from the City's examination of:

- different methods of curbside collection available to Abbotsford
- alternative collection service models, including the *status quo* model that divides the City into two service zones, each with its own collector
- the potential to provide separate glass collection and large item pick-up programs
- options available for processing recyclables

Recommendations for Council to consider on each of these topics have been provided throughout the document. This final section combines the various recommendations into one full set, as follows:

**Curbside Collection Methods**

- *THAT Council approve fully-automated collection for all three solid waste streams as*

*the preferred collection method for the City of Abbotsford; and*

- *THAT Council approve every-other-week curbside recycling pick-up, using fully-automated collection, as the preferred collection frequency for recyclables.*

**Service Delivery Options**

- *THAT Council endorse the Hybrid Delivery Model as the preferred curbside collection service delivery model for the City of Abbotsford;*

**Glass and Large Item Pick-Up**

- *THAT Council direct staff to issue separate requests for proposals for a monthly curbside glass collection program, and a limited curbside large item pick-up program, for the City as a whole;*
- *THAT Council direct staff to report back to Council, following the assessment of proposals, with recommendations on a curbside glass and large item pick-up program for the City.*

**Processing of Recyclables**

- *THAT Council direct staff to work with the District of Mission in developing and issuing a first-stage Request for Expression of Interest to gauge the level of interest among qualified third-party entities in the options proposed, and to seek input from qualified firms on additional options for the municipalities to consider.*
- *THAT Council direct staff to return to Council, following the Request for Expression of Interest process to receive and process recyclables, to advise on next steps.*

**City of Abbotsford  
Solid Waste Operations Master Plan  
Attachment I**

## COLLECTION METHODS

This Attachment presents a cost comparison of manual collection and fully-automated collection. All one-time capital costs have been amortized over asset lifespans to provide annual cost figures.

ANNUAL COSTS	OPTION 1 Manual	OPTION 2 Automated
<b>Vehicles</b>		
Purchase of CNG Vehicles	782,900	748,209
Maintenance	448,000	372,900
Fuel & Oil	287,980	226,270
Insurance	54,000	43,200
Facility Retrofit	156,268	156,268
<b>Receptacles</b>		
Blue Boxes	109,360	-
Carts		477,933
Cart Assembly & Delivery		19,292
<b>Labour</b>		
Sanitation Salaries (fully loaded)	1,303,235	1,065,253
Solid Waste Management (portion)	43,012	43,012
WorkSafe BC	200,000	40,000
Replacement Contractors	330,000	66,000
Cart Administrator Salary (fully loaded)	-	83,000
Collection Quality Control (students)	-	75,000
Training for Sanitation Crews (automated)	-	4,688
<b>Overhead</b>		
Over-and-Above Embedded	163,449	150,525
<b>TOTAL ANNUAL COST (26,300 HOUSEHOLDS)</b>	<b>3,878,204</b>	<b>3,571,550</b>
<b>PERCENTAGE DIFFERENCE</b>	<b>7.9</b>	

## **COMMON ASSUMPTIONS**

---

### **KEY ASSUMPTIONS**

All costing exercises require assumptions to be made — the current exercise is no exception. Assumptions that are specific to each of the two collection method options are identified under each option in the body of the report. Assumptions that are common to both methods are explained in this attachment.

### **New Vehicles**

New collection vehicles would be purchased by the City under both options. All of the City's existing collection vehicles have either reached or exceeded their lifespans. The number of new vehicles required is slightly different for each option, as noted in the report.

### **Funding**

In order to accurately compare the full costs associated with the two collection methods, reserves that may be available to help offset the cost of vehicle purchases have been omitted from calculations. The analysis is based, instead, on vehicles for both options being financed and amortized (straight-line amortization) over their full seven-year lifespans. The fixed ten-year Municipal Finance Authority rate of 3.1% is used for amortization. The resulting vehicle purchase cost identified for each option is the annual cost (principal and interest) to the City.

### **Compressed Natural Gas**

The City's existing vehicles are diesel powered. In keeping with industry best practices and with the greenhouse gas emissions reduction goals outlined in Abbotsford's *Official Community Plan*, all new vehicles would be powered by CNG.

### **CNG Refueling Station**

The cost related to the provision of a CNG refueling station is not included in the assessment. Through discussions with Fortis BC, it is clear that City CNG collection vehicles would be refueled either at:

- an existing Fortis BC CNG facility at a third-party location, using the quick-fill method
- a new Fortis BC facility, to be built at Fortis' expense at the City's works yard, using either the quick-fill or slow-fill method

The cost of fuel to the City in both cases would be the same.

### **Maintenance Facility Retrofit**

The City's existing vehicle maintenance facility would need to be retrofitted to accommodate CNG vehicles. Based on work undertaken by the City through its *Green Fleet Strategy*, a conservative cost estimate for the retrofit is \$1.0 million, net of Fortis BC incentives. The need for the retrofit would be driven by, and would primarily benefit, the sanitation collection vehicles. For that reason, the full annual (amortized) cost of \$156,000 is assigned to both options.

### **Single-Compartment Trucks**

The City currently uses a combination of single-compartment vehicles for the collection of garbage, and dual-compartment vehicles for recycling and organics. Emterra in East Abbotsford uses single-compartment vehicles for all streams. Based on discussions with Abbotsford's solid waste collection managers and with managers in other jurisdictions, including New Westminster, Port Coquitlam and Saanich, all new CNG vehicles would be single-compartment in design. In general,

single-compartment vehicles allow for greater efficiency in collection.<sup>1</sup>

### **Vehicle Maintenance**

Annual costs for vehicle maintenance, fuel and oil, and insurance are based on actual City costs for its youngest existing vehicles, adjusted to take into account the experiences of other service providers that have switched from diesel to CNG engines. The costs also take into account the fact that the two back-up vehicles would not be used full-time.

### **Labour Costs**

Salary and benefit costs for vehicle drivers and one exempt manager are included in each option. A premium paid to two supervisors is also included. As well, a percentage of Solid Waste management salary costs are included for a Senior Engineer (15%), Solid Waste Coordinator (20%), and Director (5%). All wage, salary and benefit costs are taken from actual City costs.

### **EOW Recycling**

The City's curbside recycling collection would shift from the current every-week service to EOW service under both options. This shift is an important part of the broader effort to maximize collection service efficiency.

In municipalities with fully-automated collection, EOW recycling is simple to implement and is becoming standard. The large blue carts that are integral to the fully-automated method easily accommodate two weeks' worth of recyclables. EOW recycling is more difficult in municipalities with manual recycling collection. Some places with manual service do provide recycling on an EOW-basis — a key example is the Capital Regional District. The practice in manual collection systems, however, is not as widespread as it is in automated systems.<sup>2</sup>

---

<sup>1</sup> The City could choose, upon further analysis, to purchase one dual-compartment truck for rural areas under both manual and fully-automated collection. This decision would not change the options' costs in any measurable way, or the

difference between the options' costs.  
<sup>2</sup> Municipalities that have chosen to transition to automated recycling collection cite the ability to collect on an EOW-basis as a contributing factor.

## CONTAMINATION

---

### RECYCLING CONTAMINATION

As a collection contractor for Recycle BC, the City is expected to ensure that curbside recyclables collected within the municipality and delivered to the Abbotsford-Mission Recycling Depot do not contain unacceptable materials (i.e., contaminants) at levels beyond Recycle BC's stated limit of 3% (by weight). Recycle BC has the right to impose penalties on all contractors for higher-than-acceptable levels of contamination.

### Multi-Stream vs Single-Stream Recycling

Multi-stream recycling refers to systems in which households are expected to separate different types of materials into different containers prior to collection. On collection day, households place the different containers curbside for pick-up, either at the same time or at different times, as instructed.

Single-stream recycling refers to systems in which households place all acceptable materials into a single container. The container may be a single-use plastic bag (in the process of being phased-out), a large blue box, or a recycling cart on wheels.

There are several advantages to single-stream recycling, including:

- its ease and convenience for users, which are believed to result in higher recycling participation rates than would otherwise occur
- lower vehicle costs and higher collection efficiency associated with the use of single-compartment vehicles

- greater fleet flexibility, since single-compartment trucks may be used for other streams (i.e., garbage, organics)

The principal disadvantage to single-stream recycling is contamination at levels that are typically higher than those experienced in multi-stream systems.

### Fully-Automated Collection

The issue of contamination arises in discussions on fully-automated collection because of the method's use of (and reliance on) single-stream carts. The potential for higher-than-acceptable levels of contamination in cart-based systems has prompted Recycle BC to discourage contractors from using fully-automated collection for curbside recycling.<sup>1</sup>

Recycle BC's preferences notwithstanding, there are several communities in the province that continue to use the fully-automated collection method. The challenge for service providers in these places is to find ways to reduce cart contamination.

Several local governments — Nanaimo, Courtenay, Surrey, Port Coquitlam, and the Cariboo Regional District are examples — have developed, and/or are in the process of developing, strategies to manage contamination. All strategies feature extensive resident engagement and education, augmented by regulation, cart-content monitoring (using radio frequency identification equipment — RFID), and enforcement. A recent strategy

can be changed with the introduction of additional containers to accommodate the multi-stream approach.

---

<sup>1</sup> It is worth noting that some manual systems, including the current single-use blue bag system in Abbotsford and the blue-box system in Chilliwack, also feature single-stream recycling. Unlike fully-automated systems, however, manual systems

implemented by the Cariboo Regional District resulted in:

- a reduction in the percentage of carts with some amount of contamination from 55% to 26%
- a reduction in all types of contaminants
- a significant reduction in the overall level of contamination from 17.2% in 2015 to the Recycle BC program average of 5.7% in 2017<sup>2</sup>

Programs in Surrey and Port Coquitlam make use of student recycling ambassadors to assist in resident education. These ambassadors walk neighbourhoods on cart collection day, inspect individual carts for contamination, and engage directly with residents to help them understand what items cannot be placed in the carts, and why.

#### **Implications for Abbotsford**

The potential for contamination is not intended to suggest that Abbotsford should reject fully-automated collection for its curbside recycling — on the contrary, the report recommends this collection method. The review of the issue does, however, highlight the challenge for Abbotsford to develop and implement a robust program of best practices to combat contamination.

#### **ORGANICS CONTAMINATION**

Contamination of curbside organics in Abbotsford appears to be less of a concern than contamination of recyclables. The potential for organics contamination in a fully-automated system, however, needs to be acknowledged and addressed. Action to combat such contamination could feature some of all of the same practices as those used for recyclables, including the use of RFID equipment which would be in place on every new vehicle and cart.

---

<sup>2</sup> See "Contamination: Developing Best Practices for Solving Contamination Issues", Recycle BC Consultation, 2017

**City of Abbotsford  
Solid Waste Operations Master Plan  
Attachment IV**

## SERVICE DELIVERY MODELS

This Attachment presents a cost comparison of the three service delivery models. All one-time capital costs have been amortized over asset lifespans to provide annual cost figures.

ANNUAL COSTS	MODEL 1 Hybrid	MODEL 2 City Delivery	MODEL 3 Contractor
<b>CITY OF ABBOTSFORD</b>			
<b>Vehicles</b>			
Purchase of CNG Vehicles	374,104	748,209	-
Maintenance	186,450	372,900	-
Fuel & Oil	113,135	226,270	-
Insurance	21,600	43,200	-
Maintenance Facility Retrofit	86,451	86,451	-
Route Planning Software	40,627	40,627	-
<b>Receptacles</b>			
Carts	477,933	477,933	477,933
Cart Assembly & Delivery	19,292	19,292	19,292
<b>Labour</b>			
Sanitation Salaries (fully loaded)	589,289	1,065,253	-
Solid Waste Management (portion)	43,012	43,012	-
WorkSafe BC	20,000	40,000	-
Replacement Contractors	33,000	66,000	-
Cart Administrator Salary (fully loaded)	83,000	83,000	83,000
Collection Quality Control (students)	75,000	75,000	75,000
Training for Sanitation Crews (automated)	2,344	4,688	-
Delivery Contract Administration	30,000	-	30,000
<b>Overhead</b>			
Over-and-Above Embedded	95,270	149,241	30,150
<b>Total City of Abbotsford</b>	<b>2,290,508</b>	<b>3,541,075</b>	<b>715,375</b>
<b>CONTRACT HAULER</b>			
<b>Contract with Hauler</b>	1,113,828	-	2,305,028
<b>Total Contract Hauler</b>	<b>1,113,828</b>	<b>-</b>	<b>2,305,028</b>
<b>Total City of Abbotsford</b>	<b>2,290,508</b>	<b>3,541,075</b>	<b>715,375</b>
<b>Total Contract Hauler</b>	<b>1,113,828</b>	<b>-</b>	<b>2,305,028</b>
<b>TOTAL COST (26,300 HOUSEHOLDS)</b>	<b>3,404,335</b>	<b>3,541,075</b>	<b>3,020,404</b>
<b>Percentage Above Model 3 (Contract Hauler)</b>	<b>12.7</b>	<b>17.2</b>	<b>-</b>