

Waste & Recycling Services Collection Services Review Attachment 3 – Industry Scan and Strategic Analysis



PRESENTED TO
The City of Calgary

DECEMBER 2018
ISSUED FOR USE: ISC: UNRESTRICTED
FILE: 704-SWM.PLAN03046-01

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1.0 INDUSTRY SCAN

Collecting waste from single detached dwellings has evolved over the past three decades from a one stream (garbage only) system to, typically, a three-stream system that consists of separated garbage, recyclables and organics. In Canada, the entities who administer these collection programs are typically the municipality but the entity who actually delivers the waste stream collection service can be either in-house/municipal staff or contracted out to private sector service providers or a combination of both. This section discusses the various aspects of the curbside waste collection industry.

1.1 Service Delivery Models

Most municipalities in Canada have service delivery models for curbside collection that consist of municipal crews, contracted services or a combination of arrangements. Table 3-1 provides a summary and comparison of the three main service delivery models.

Table 3-1: Comparison of Service Delivery Models for Residential Curbside Collection

	Public Sector (In-House Service)	Mixed (In-House and Contracted Service)	Private Sector (Contracted Service)
Model Description	<ul style="list-style-type: none"> City is responsible for staffing, collection, procurement and maintenance of vehicles. City manages customer service operations. 	<ul style="list-style-type: none"> Divided into work areas either by geography or material type. Residential collection managed through a combination of public and private sector service providers. Private sector is managed through contract or agreement. As a secondary implementation decision, can be established via Managed Competition where The City provides a bid to compete with private sector contractors for the work. 	<ul style="list-style-type: none"> City issues request for proposal for private sector to bid on contract, agreement of exclusive permit to operate. Depending on arrangement, customer service requests can be managed by City or private sector contractor. As secondary implementation decisions: <ul style="list-style-type: none"> Can be one service provider or multiple. Can be divided by geography or by material type.

Historically, waste collection from single detached dwellings was delivered by the public sector. Due to a number of variables that include: collection cost, operational efficiencies, work site injuries, labour relations, asset management, etc., there has been a growing trend across North America to outsource waste collection services. In most of these cases, waste collection was conducted manually. One or two swampers would ride and stand off the back of a rear packer garbage truck and jump off the truck as it neared the waste to grab and throw the materials into the back of the truck. Jumping on and off of a slow-moving truck and throwing garbage cans and bags that weigh up to 25 kg can result in a number of different types of worker injuries. These injuries result in higher costs to the city or program because of workers compensation and replacement worker costs. This was typically one of the main drivers for changing the delivery model to contracted services.

Over the past decade, the collection approach has been changing from manual collection to automated collection. More and more communities are transitioning to this new approach because of technological and labour management improvements. Ultimately, it leads to cost savings for the following reasons:

- Labour costs: automated collection requires one staff person (i.e. a certified truck operator) versus two to three staff members (including physical labourers) for manual collection.
- Worker compensation cost: automated collection has less probability of detrimental physical injuries and results in lower insurance costs for the entire corporation.
- Labour management: automated collection allows for a wider range of workers (less reliant on young workers by reducing physical labour requirements).
- Technical improvements: advancements in robotics means automated trucks can perform almost as well as manual trucks in urban settings with tight set-outs and in terms of tipping speed.

With fewer labour related issues, many communities are starting to reconsider their service delivery model. There are cities that have changed from a contracted service model to an in-house model because of service improvements, flexibility to change and less reliance on private sector waste haulers. In the past two years this includes the Canadian Cities of St. John’s, Nanaimo, and Port Coquitlam amongst others.

1.1.1 Evaluation of Alternative Service Delivery Models

The purpose of this section is to provide a qualitative analysis of the alternative service delivery models against the priority residential collection services objectives as defined in Section 2.4. This considers **industry-general** advantages, concerns, and overall degree of support for each objective are noted for each delivery model. Where it is perceived that WRS is an exception to the industry-general observations, specific notes have been included.

1.1.1.1 Public Sector Model (In-House)

This section provides a qualitative evaluation of the Public Sector Model relative to each collection services objective.

Customer Experience

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Municipalities have more control to manage collection services scope and quality of service. This increased control makes it easier to: <ul style="list-style-type: none"> – Provide a high-quality customer experience; – Respond to and modify service levels (if desired in the future); – Direct drivers to provide a greater extent of customer cart tagging / education to encourage desired customer behaviour; and – Direct drivers to provide any additional community value-add services where desired (e.g., calling 311 for City tree / road or other community issues). ▪ Typically, more drivers with longer tenures of service, thereby enabling a more consistent customer experience. ▪ Municipalities, through recognition and adoption of emerging citizen-focused public service models, are now providing drivers with extensive customer service training. ▪ Municipal crews can be more readily deployed to provide other services (e.g., community emergency response). 	<ul style="list-style-type: none"> ▪ Municipalities typically bear pressure to both limit user fee increases and deliver high quality customer experience, which are conflicting objectives: <ul style="list-style-type: none"> – Municipalities may sacrifice desired customer experience objectives to fit within approved budget envelopes. ▪ Existing service requirements to complete beats on-time may hinder customer education (in some cases) or providing other types of community value-add activities. ▪ Within Alberta, there is a risk of labour instability over the longer-term. As such, driver availability and retention willingness can be dependent on the condition of the labour market across the province. ▪ Within some municipalities, there are examples of disruptive relationships with labour unions which have resulted in strikes, service disruptions, and poor reliability. <ul style="list-style-type: none"> – <i>It should be noted that Calgary has historically not been subject to such labour disruptions.</i>

Overall, it is viewed that the Public Model can be **strongly aligned** to the customer experience objective. This is gained primarily from a municipality’s ability to directly control the desired customer service levels and benefit from emerging municipal citizen-focused public service models. However, a key factor in this evaluation for any specific municipality is its relationship with its labour union. There are examples where municipalities have not reliably or consistently provided collection services due to labour disruptions.

Safety

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Often results in better worker conditions, benefits and safety and health training <ul style="list-style-type: none"> – <i>In particular, it is noted that WRS has focused on truck ergonomic features for enhanced driver safety</i> ▪ Municipalities tend to enforce stricter requirements for internal driver competencies than the minimum Provincial requirements. ▪ Municipalities can directly monitor the impacts of safety choices. 	<ul style="list-style-type: none"> ▪ Budget limitations can result in cost cutting measures on safety investments as other expenses rise.

Overall, it is viewed that the Public Model can be **strongly aligned** to the Safety objective primarily due to typically better working conditions and the municipality’s ability to directly control the organization’s adoption of a safety-minded environment.

Environment

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Direct control over the implementation of desired environmental objectives. ▪ Municipalities can develop a specific culture focused on environmental outcomes: <ul style="list-style-type: none"> – <i>E.g. Utilizing Triple-Bottom-Line as decision criteria to guide organization investments, providing ongoing tracking and environmental reporting, ensuring use of vehicle spill kits, providing focused employee training, etc.</i> 	<ul style="list-style-type: none"> ▪ Municipalities typically lag private sector with respect to certain vehicle technologies: <ul style="list-style-type: none"> – <i>e.g., municipalities tend to be risk averse – will let others prove new technologies first prior to adoption</i> ▪ Noted that some private sector collection entities have adopted natural gas vehicles, which tend to produce fewer emissions vs. diesel vehicles.

Overall, it is viewed that the Public Model can be **moderately aligned** to the environment objective. Although it has more direct control on achieving desired environmental outcomes and has typically developed an enhanced organizational culture focused on minimizing impact to the environment, it typically lags the private sector in the adoption of leading vehicle technologies focused on fuel efficiency and limitation of emissions.

Cost

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Municipalities typically operate on a cost-recovery basis – which avoids a profit rate-revenue requirement (<i>which can range from 7% to 15% in the private sector</i>). ▪ Avoids incremental contract management, procurement, and service request coordination costs (<i>required for an outsourced model</i>). ▪ Enables greater economies of scale and scope (<i>particularly vs. the Mixed Model</i>). ▪ Enables Council a greater degree of control in setting future user rates / directing cost reduction initiatives: <ul style="list-style-type: none"> – <i>Typically, waste collection contracts lock in rates for the private sector vendor over a 7-8-year timeframe.</i> ▪ Avoids the potential risk of an incumbent contractor advantage: <ul style="list-style-type: none"> – <i>Industry research has noted that some municipalities which have outsourced sizable collection contracts have resulted in providing the private entity a first mover advantage vs. its private sector competitors, thus decreasing the level of competition for future contracts.</i> ▪ Municipalities typically have access to a lower cost of capital / borrowing for capital (vehicles / equipment). 	<ul style="list-style-type: none"> ▪ Unlike private sector, no profit motive exists for the public sector to help drive efficiency and lower overall cost for collection services. ▪ Municipal fleet services, which provide services for all municipal departments, can typically be less focused and efficient specifically for collection trucks vs. private sector (<i>which are typically streamlined for their collections business</i>). ▪ Private sector entities can provide a lower cost of service primarily either through: <ul style="list-style-type: none"> – <i>Aggressive “low-ball” bids in order to initially win the work; and</i> – <i>Lower total labour wages and benefits.</i>

Overall, it is viewed that the Public Model can be **moderately aligned** to the Cost objective, although this will vary from municipality to municipality based on the degree to which their internal capabilities have been developed. Observations from across the industry repeatedly point to cost savings realized from outsourcing to the private sector (at least initially). However, these observations also indicate that municipalities who have focused on increasing their internal operational efficiencies and effectiveness can do so. Note that further specific cost comparisons between the Private Sector and WRS’ current service delivery model are provided in **Section 6.0**.

1.1.1.2 Mixed Model

This section provides a qualitative evaluation of the Mixed Model relative to each collection services objective.

Customer Experience

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Allows the municipality to maintain control on the overall customer experience and service. ▪ Enables municipality to retain an in-depth understanding of collection operations from which to monitor and compare vs. the outsourced portion. <ul style="list-style-type: none"> – <i>Can directly compare metrics for internal vs. outsourced portions (if included in contract required reporting).</i> – <i>Possibility to learn leading practices from private hauler.</i> ▪ Maintains internal collections capabilities – can ramp up as potential risk mitigation in case service disruption occurs with private hauler. 	<ul style="list-style-type: none"> ▪ Positions customer interactions to be partially managed through arms-at-length contract – harder to control and adjust (<i>in case of future changes to service levels</i>). ▪ Customer experience could be inconsistent and dependent on geography / material type. ▪ Mixed model can be complex to implement and requires more resources to administer effectively, particularly upon managing and reporting customer service request responses vs. hauler contract clauses incentives and/or penalties.

<ul style="list-style-type: none"> - Similarly, in cases where service disruption occurs within the in-house portion, the private sector could ramp up resourcing to help mitigate. ▪ Municipal crews can be used to provide other services (e.g., emergency response). 	<ul style="list-style-type: none"> - Potential risk to customer experience. ▪ For a private hauler, the profit motive / drive for efficiency may sometimes be in direct conflict with service quality.
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Overall, it is viewed that the Mixed Model can be **moderately aligned** to the customer experience objective. Customer service interactions become increasingly provided by an arms-at-length model, which decreases the direct control a municipality has to achieve desired customer outcomes. In addition, there is increased risk to customer service consistency given the additional number of collections providers.

Safety

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Municipality has direct control over the setting of working conditions for their staff. ▪ Enables the municipality to achieve a minimum level of safety that may be then compared to private sector. 	<ul style="list-style-type: none"> ▪ Requires the municipality to provide contract management efforts to ensure outsourced model operates in accordance with internal expectations. ▪ It is less likely that the private sector hauler would divulge safety performance; may be more difficult to measure (e.g., property damage). ▪ There is potential that the private sector adheres to lower safety standards compared to the municipality. <ul style="list-style-type: none"> - It is noted that WRS' safety standards for driver demerits is more stringent than Provincial requirements.

Overall, it is viewed that the Mixed Model can be **moderately aligned** to the safety objective given that it is unlikely that the Private Sector would perform at the same levels as the Public Sector Model.

Environment

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Municipality maintains some level of control over environmental factors (e.g., greenhouse gas [GHG] emissions). ▪ May be able to leverage private-sector truck fuel technology advantages vs. municipal fleet. 	<ul style="list-style-type: none"> ▪ May be more difficult to measure private hauler environmental performance (e.g., emissions, fluid spills). ▪ Pending final route designs between municipality vs. private sector hauler – Mixed Model may result in increased mileage and fuel consumption.

Overall, it is viewed that the Mixed Model can be **moderately aligned** to the environment objective. Potential increases in risk to environmental performance introduced from outsourcing portions of the collection network may be mitigated by gains from increased utilization of vehicles with increased fuel technologies.

Cost

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Takes advantage of potentially lower cost of service which the private sector may be able to provide. ▪ Enables the municipality to compare in-house costs and performance vs. those of outsourced model, which in turn can drive internal efficiencies through competitive tension. ▪ Can enable the municipality to spread contracts among qualified vendors to: <ul style="list-style-type: none"> – <i>Maintain competitive tension;</i> – <i>Prevent potential incumbent advantage; and</i> – <i>Assign specific districts / materials to vendors based on unique competencies</i> ▪ Municipality can alleviate potential fleet decommissioning costs through retirement of older/less reliable trucks. <ul style="list-style-type: none"> – <i>Examples of private hauler commencing collections contract with a fleet with a mixed lifecycle status (i.e. not all new trucks upon commencement) which enables it to avoid larger initial capital investments</i> 	<ul style="list-style-type: none"> ▪ Could result in incumbent contractor advantage based on the local market, which risks increased costs for future contract negotiations. ▪ With multiple providers, the entire collection system may potentially risk diseconomies of scale (<i>e.g., inefficiencies, duplicate resources and processes, etc.</i>). ▪ Potential for single private hauler to come in at a throw-away price that is not competitive and “true” for the overall market. ▪ Requires municipality to invest in ongoing contract management, procurement, and service request coordination resources and costs. ▪ Will require some one-time change costs for every contract (i.e. once every 7-8 years).

Overall, it is viewed that the Mixed Model can be **strongly aligned** to the cost objective, primarily with the expectation that the private sector can provide a lower cost of service. Note that further specific cost comparisons between the private sector and WRS’ current service delivery model are provided in **Section 6.0**.

1.1.1.3 Private Sector Model (Fully Contracted Service)

This section provides a qualitative evaluation of the Private Sector Model (fully contracted out) relative to each collection services objective.

Customer Experience

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Still possible to manage reasonable customer experience outcomes through contract management requirements and tactics. ▪ Recognizes that as long as reliable collection occurs on scheduled day of pick-up, customers may not tangibly notice difference in service. 	<ul style="list-style-type: none"> ▪ Municipality would be “out of the game” – difficult to re-enter should service disruptions or performance / cost issues arise. ▪ Direct customer interactions now fully managed through arms-at-length contract – harder to control and adjust (<i>in case of future changes to service levels</i>). <ul style="list-style-type: none"> – <i>Service changes need to be negotiated with private haulers, making it more difficult for city to standardize or improve services.</i> ▪ Customer experience could be inconsistent and dependent on geography / material type / number of individual private haulers. ▪ The private sector entity’s profit motive / drive for efficiency could impact service quality. ▪ Risk in loss of consistency due to higher turnover of staff vs. usual municipality norms. ▪ Service reliability entirely based on private sector’s ability to attract and retain competent drivers, which has not

	consistently been the case in situations across North America.
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Overall, it is viewed that the Private Sector Model can be **weakly aligned** to the customer experience objective. Customer service interactions are entirely left to an arms-at-length contract relationship and present significant levels of risk.

Safety

Advantages	Concerns
<ul style="list-style-type: none"> ▪ Enables municipality to ensure that minimum-level safety objectives are included in contract with the private entities. ▪ Avoids internal efforts focused on further investments to optimize internal working conditions (e.g., <i>truck ergonomics</i>). 	<ul style="list-style-type: none"> ▪ Requires municipal contract management efforts to ensure outsourced model operates in accordance with internal expectations. ▪ May be more difficult to measure private hauler safety performance (e.g., property damage), which puts this performance at risk vs. the other models. ▪ There are noted instances where private hauler worker conditions have been significantly below typical municipal expectations.

Overall, it is viewed that the Private Sector Model can be **weakly aligned** to the safety objective given that it is unlikely that the private sector would perform at the same levels as the Public Sector Model.

Environment

Advantages	Concerns
<ul style="list-style-type: none"> ▪ May be able to leverage private-sector truck fuel technology advantages. 	<ul style="list-style-type: none"> ▪ May be more difficult to measure private hauler environmental performance (e.g., emissions, fluid spills).

Overall, it is viewed that the Private Sector Model can be **weakly aligned** to the Environment objective, as typical private sector focus on this outcome are less than those of municipalities.

Cost

Advantages	Concerns
<ul style="list-style-type: none"> • Profit incentive of private hauler to continuously drive for efficiencies can result in lower cost operations than public (in-house) or mixed models. ▪ Private hauler may have synergies in its other local waste management operations – which may be leveraged to reduce costs. <ul style="list-style-type: none"> – e.g., using collection trucks on non-residential collection days to reduce normalized truck cost. ▪ May achieve greater economies of scale (e.g., international) and as such potential cost reductions. <ul style="list-style-type: none"> – Private sector might have ability to drive down capital purchase costs. 	<ul style="list-style-type: none"> ▪ If using only one hauler, the incumbent may have a distinct incumbent advantage in future proposals / bids, thus costs can rise substantially over time. <ul style="list-style-type: none"> – <i>It has been repeatedly studied and identified that the degree of savings from outsourcing decreases over time due to a decrease in market competitiveness and increase in the municipality's operational efficiencies. If fully outsourced, this competitive tension between internal vs. outsourced operations is lost.</i> ▪ Municipality must spend the resources, time and money to develop and negotiate high quality service requirements on go-forward basis. ▪ Cost of incremental and ongoing procurement, contract negotiation and management must be considered against savings. ▪ Will require some one-time change costs for every contract (i.e. once every 7-8 years). ▪ Timing of contracts / procurement needs to be staggered if multiple vendors. ▪ If multiple vendors – economies of scale are dependent on the size of the zones tendered (costs can increase if zones are too small). ▪ Municipality would face potential decommissioning costs for existing fleet – slim potential market for used inventory.

Overall, it is viewed that the Private Sector Model can be **moderately aligned** to the cost objective. Although there may be more significant initial savings than the other models, there is more risk to cost increases over the medium to long-term.

1.1.1.4 Summary of Qualitative Evaluation of Alternative Models

Based on the in-depth qualitative evaluation of the model alternatives in the previous sections and WRS-specific observations (for WRS' current Public Model), the following summary evaluation of each service delivery model against each priority objective is provided:

Objective	WRS' Public Model	Mixed Model	Private Model (Fully Outsourced)
Customer Experience	Strong	Moderate	Weak
Safety	Strong	Moderate	Weak
Environment	Moderate	Moderate	Weak
Cost	Moderate	Strong	Moderate

From this analysis, it demonstrates that WRS' Public Sector Model is likely to achieve stronger levels of customer experience and safety outcomes but may feature higher costs than a model which partially outsources to a private sector entity. There are advantages and concerns for public vs. private sector performance in regard to the

environment objectives for each service delivery model. However, as greater portions of the collection network are outsourced to the private sector, there are increasing risks in achieving desired customer experience and safety outcomes. The increase in risks primarily stem from the lack of direct control a municipality has from an arm-at-length contract (which are normally set for a 7-8-year duration, and thus more difficult to adjust over time pending changing customer or Council priorities). In addition, there is evidence of increased risk for the private sector attracting and retaining sufficiently competent drivers, which can result in significant service instability and unreliability.

This presents the need to quantitatively estimate the degree of potential cost savings from an outsourcing arrangement and compare to the added performance risks. This analysis is provided in **Section 6.0**.

1.2 Waste Collection Components

Waste collection cost considerations typically consists of four components: (1) fleet management which includes collection system assets such as collection vehicles and containers and consumables such as fuel; (2) labour management that consists of the people who operate the collection system assets; (3) administrators who plan and/or manage the collection system; and (4) customer service component which helps collection customers understand how to use the collection system and/or field questions and requests regarding their service.

Figure 3-1 illustrates the four key components that make up the cost for a residential curbside collection program. The following subsections describes the four components in greater detail.



Figure 3-1: Waste Collection Cost Illustration

1.2.1 Fleet Management

The fleet management cost is one of the largest portions of the waste collection costs and consists of the equipment used to collect the waste, fuel to run the equipment and operation and maintenance of that equipment. The following describes the various aspects of the assets in greater detail.

1.2.1.1 Collection Equipment

Collection equipment consists of collection vehicles and in some instances, generator-based waste receptacles such as carts that service curbside collection customers. There are generally two companies that supply collection trucks to the industry in North America (LeBrie and Heil).

The total cost for a standard collection truck ranges from approximately \$200,000 for a rear load truck to \$300,000 for an automated side loader. The cost is dependent on two key considerations: (1) the chassis of the truck and (2) the box and body parts that are put on the truck.

- The cost of the chassis can range from \$100,000 to \$150,000. Most trucks that are in the low-cost range have chassis that cost between \$100,000 to \$120,000. It is important to note that the chassis are built in the United States and their cost can be affected by fluctuations in the US exchange rate and potentially trade tariffs.
- The cost of the payload box and the loader position are other cost considerations that make up the remainder of the total cost. A rear loader with a built-in compactor adds approximately \$100,000 to the cost of the chassis. A side loader with a compactor adds about \$150,000 to the cost of the chassis, and an automated side loading arm is an additional \$30,000 to \$50,000. Figure 3-2 shows photos of two collection truck configurations used by WRS.



Figure 3-2: Photos of Side Load and Rear Load Waste Collection Trucks

Added features to a collection truck whether it is for comfort, or safety reasons, can add up to 25% to the total cost of the waste collection truck. Right-hand-side driver control is typically an added feature and adds in the order of \$25,000 to the cost of the truck. Cameras, sensors, air conditioning and air-ride suspension seats normally add less than \$10,000 to the overall cost of the truck.

Interesting notes from the collection truck suppliers include the following:

- About 80% of the curbside collection vehicle market is automated.
- Typical vehicle replacement is 7 to 8 years with most trucks logging between 12,000 and 13,000 hours of use.
- Automated arms require considerable ongoing maintenance and should be rebuilt every 5 to 7 years.
- Maintenance requirements are less extensive for rear load trucks.
- With the possible exception of the largest waste collection firm, most private sector waste haulers do not purchase collection trucks at a discounted rate.
- Truck delivery from time of ordering is typically 12 to 18 months.

Financial implications of collection trucks are typically amortized on an annual basis. Amortization periods normally coincide with replacement vehicle periods. Trucks that are amortized for a shorter period such as five years will result in higher annual costs to pay for that vehicle. For this reason, most communities that contract out their collection service to the private sector have a contract length that is consistent with expected vehicle life.

Most communities require a certain number of vehicles (i.e., spare ratio) to accommodate vehicles that are taken out of service for repairs or to account for busier waste collection periods. Spare ratios range from 10% to 20% which means an additional truck or two is required for every fleet of 10 collection trucks. Having these extra vehicles adds to the total cost of collection assets.

1.2.1.2 Fuel

The standard fuel type for most collection fleets is diesel. In the past decade, more fleets are moving towards compressed natural gas (CNG) because the cost for CNG is almost half the cost of diesel and emissions from CNG vehicles are less. Although diesel fueled trucks deliver about 15% more power than CNG, many public and private sector waste haulers are moving towards using CNG for the financial and environmental benefits. However, CNG collection trucks typically cost 10% more and fueling stations need to be established or arrangements made with existing fueling stations.

Waste Management Inc. has so far replaced 14,000 of its more than 18,000 trucks with natural gas fueled vehicles which save an estimated 8,000 gallons of diesel fuel, worth approximately \$31,000, per truck per year. A CNG garbage truck only costs \$30,000 more than a comparable diesel truck, so most major service providers that have access to CNG or LNG fueling stations, or are willing to build in their own, are in the process of transitioning their fleet to the new fuel. (from Ford Research Group).

Another aspect with regards to CNG is bio-CNG which comes from landfill gas and anaerobic digestion of source separated organics, such as the materials in WRS's green cart program. Collecting and upgrading landfill gas for vehicle use has been occurring for over a decade. Recent trends in solid waste management include anaerobic digestion of source separated organics to produce biogas which can be used by a combined heat and power (CHP) unit to generate electricity and heat or upgraded for use as vehicle fuel or injected into the CNG distribution network. It should also be noted that bio-CNG is not fossil fuel based and is exempt from the GHG accounting protocol.

A new innovation for waste collection is electric/battery powered collection vehicles. These vehicles are being tested in many jurisdictions and might be an alternative in the future when more sustainable energy generation options such as solar and wind become more available. A limitation with electrical vehicles is poor battery performance during cold weather conditions. The Municipality of Anchorage is testing electric waste collection vehicles and it is worth contacting them in the near future to discuss their overall experience.

WRS is working on an Alternative Fuels Strategy for all of its vehicles.

1.2.1.3 Operation and Maintenance

Operating and maintaining collection trucks is a large undertaking. Automated collection vehicles require more maintenance and generally it is recommended that automated arms be rebuilt after approximately 5 years of use. According to a collection truck supplier, annual maintenance cost for an automated truck is typically between 10% and 13% of the cost of the truck, which equates to approximately \$30,000 to \$40,000 per year per truck. This is an average over the life of the vehicle with maintenance requirements for the first four years of use generally much less compared to the last three to four years of the vehicle's life. In addition, the maintenance costs by year seven or eight are such that purchasing a new truck is typically more cost effective.

Recognizing the expected maintenance cycle, it is ideal to spread out the vehicle replacement process over the likely life of the vehicles. This is estimated to be 15% of the fleet annually. This should provide a more consistent maintenance demand and minimize peaks for major servicing and or breakdowns.

In northern climates such as the Canadian Prairies where temperatures are typically -10°C or below during the winter months, collection vehicles are more often stored indoors in large vehicle shelters which reduces maintenance costs of the vehicles and improves start up times during cold winter mornings. This saves fuel required to warm up the vehicles, allows better performance of hydraulic systems, allows for maintenance and cleaning to occur when the vehicle is parked and not in use, and provides a better work environment for staff when they start and end their day or need to assess the condition of the vehicles.

Organizations can either maintain their vehicles on an as needed basis or also undertake a preventative maintenance program to minimize unexpected breakdowns. Although preventative maintenance has an additional cost, there are potential savings from having a smaller spare ratio and fewer service disruptions.

For the private and public sector, having in-house servicing departments are feasible when the fleet reaches a certain size. The priority is to have sufficient work so that staff can be retained full-time. Smaller fleets usually have contracts with private sector fleet shops to address their servicing needs. WRS has one of the largest publicly owned waste collection fleets in Canada and are of a suitable size to cost effectively service their vehicles in-house.

1.2.1.4 Cart Management

Most jurisdictions in Canada have moved or are in the process of moving to an automated waste collection system. Automated collection requires carts for proper storage and collection of waste materials. The jurisdictions that led the path for automated collection bought and maintained the carts that are required for the collection system. These carts are normally warranted for up to 10 years, and servicing and switching of carts typically occur over the life of the cart.

Depending of number, size, and quality of carts, the cost of carts can range from \$60 to \$120 per unit. When contracts to procure carts are awarded, most jurisdictions require the vendor deliver the carts as part of the purchase price. The vendor typically retains a firm to deliver and track the distribution of the carts. Servicing of the carts is usually left with the community. Additional resources are needed to provide additional carts that are required for replacing and switching, space or property for storage of the carts and customer service staff (including field staff) to receive calls, address issues and replace/switch carts as requested.

Some jurisdictions who contract out collection services will require the contractor to procure, deliver and maintain the carts as part of their contract. Depending on the contract arrangement, ownership of the carts could transfer to the jurisdiction at the end of the contract.

Another approach to cart management is leasing carts from the vendor. In these situations, a vendor would bid to provide and deliver the carts to the jurisdictions customers, receive and address customer service requests, and deliver the services as stipulated in the contract. This approach was used by one of the largest cities in Canada and has positive and negative aspects such as cost and contract administration.

1.2.2 Labour Management

Labour is one of the greatest challenges for waste collection programs. Prior to 2010 in Canada, most jurisdictions had manual waste collection programs where two to three people would ride each truck, collecting the various waste streams. In most instances, there was one driver and one or two swampers/helpers who would ride on the back of the collection truck until the truck came up to a garbage and/or recycling set out and the swampers would jump off the truck, grab the containers or bags, and throw the waste materials into the truck. The swampers had a physical job and in most situations, they were young men who were able to complete repetitive physical tasks under varying weather conditions.

Most jurisdictions realized that manual waste collection costs were on the rise because of worker injuries. These injuries could be caused from repetitive motions, slips/trips/falls or sprains from getting on and off the trucks or strains as a result of an aging work force (Figure 3-3). These employees would be compensated for their incurred injuries and another person would need to be brought in to replace the injured worker. This essentially doubles the labour cost for each injured person. Because of these rising labour costs, many jurisdictions turned to contracted services to move away from worker compensation claims and have the private sector deal with labour management issues.



Figure 3-3: Photo Illustrating Manual Collection with Snow on the Ground

Because of rising labour costs and injury claims, interest in automated waste collection started becoming more prevalent. Although these trucks were up to 50% more expensive than manual collection trucks, the savings from only requiring one staff member and potential for reduced workplace injury claims made automated collection the new standard for curbside waste collection. Additional benefits for automated collection trucks were the personnel who could operate these vehicles. This opened this opportunity to a wider range of workers that did not have to be physically fit and can include persons from an older workforce.

An important consideration in Western Canada is obtaining and retaining a specially trained workforce that can drive and operate a waste collection truck. Some jurisdictions had a difficult time retaining physically fit people who can drive large trucks and collect waste. These jurisdictions turned to automated collection trucks to reduce the number of workers needed and to expand the range of workers they can hire. This was the situation in interior British Columbia where it was difficult retaining trained staff who would move to jobs in the oil industry for higher wages.

The labour market in Alberta is challenging. When the oil industry is booming, wages for Class 3 drivers rise significantly and retaining staff is difficult when wages are so much higher in other sectors. Considering that waste collection contracts typically span seven years, it makes it difficult for a private sector hauler to guarantee waste collection rates if staff cannot be retained over the life of the contract and higher wages are needed to complete the waste collection services. If a contractor is unable to meet its obligations for financial or technical reasons, the city can dissolve the contract and look for another contractor (which takes significant resources) or adjust the contract to meet market rates.

1.2.3 Administration and Planning

Most jurisdictions have personnel who oversee the entire program on behalf of the municipality and have a team that, at a minimum, will be responsible for: (1) planning for the future services; (2) addressing regulatory and/or service requirements; (3) assessing the municipality's needs; (4) managing financial expenditures and revenues; (5) addressing customer complaints and queries; (6) managing contracts with internal and/or external entities; (7) managing customer accounts (new, old and closed); (8) general office/department administration; (9) procurement of vehicles and (10) performance management.

In a contracted service model, most of the responsibilities listed above still need to be overseen or undertaken by municipal staff. The extent of oversight required depends on the services that the municipality relinquishes to the private sector. The municipality will also require additional staff for contract enforcement and monitoring to ensure the contractor(s) are delivering the collection service as per the final contract.

1.2.4 Public Education and Communication

Most large cities use a call centre to receive calls from their customers, and to distribute those calls to the appropriate service providers. The financial commitment to maintain this customer service system is not likely to change if the collection services were contracted out to a private sector waste hauler.

In the United States, where many jurisdictions have a franchise system, customers call the private hauler sector directly for missed pick-ups, queries and general complaints. The municipality typically does not receive any progress and/or annual reports unless it is stipulated in the terms of the contract.

1.3 Contracted Services

The extent of a waste collection contract can range from strictly providing the labour, to conduct the work, to providing all the necessities to undertake the work. For most collection contracts, the chosen hauler provides the trucks, labour, fuel and fleet maintenance. Sometimes the rate for fuel is adjusted annually to account for unforeseen price hikes. Program planning, contract management, education/public outreach and customer service requests are usually undertaken by the municipality.

Prior to 2010, in Canada waste collection was manual and labour intensive. Due to rising labour rates and work place injury claims, municipalities moved towards contracting out their waste collection services to the private sector to avoid these costs and issues. Most private sector waste haulers are not unionized and, in addition, are not bound to the same standards as municipal workers. The private sector has a financial advantage because they typically use a workforce that is less expensive (and therefore, typically less experienced), less prone to injuries and recognises that the employment lasts for the life of the contract.

Many jurisdictions across Canada contract out waste collection services to the private sector. The rationale for contracting out from a municipality's perspective may include the following:

- Resources required to address administrative and human resource management issues;
- Rising costs as a result of worker injury claims;
- Managing asset and budgeting responsibilities;
- Perceived efficiencies provided by the private sector; and/or
- Lack of political will to acquire/re-acquire assets and labour resources for in-house collection.

Contracted collection services are not always a positive experience for municipalities or their citizens. Some municipalities have had bad agreements that led to termination of their contract. Whether it is the fault of the contractor or the municipality, the disruption of service reflects poorly on the municipality as a whole, as well as those who are administering the contract.

Important considerations to ensure a good contract and working relationship include the following:

1. **Comprehensive Contract** – have comprehensive specifications and procedures in the contract to ensure services are delivered as expected. It is also prudent to have a dispute resolution processes that enables both parties to resolve unplanned issues.
2. **Company Reputation** – retain a service provider that prides itself on good service and shared responsibility should result in a better working relationship and delivery of service.
3. **Value for Money** – the lowest cost proposal is not always the best value. Details of the value for service need to be assessed.

1.3.1 Liquidated Damages

Guidelines developed for municipalities writing collection contracts¹ often recommend including a liquidated damages clause to help recover the Municipality's costs for contractor defaults. Due to the nature of residential waste collection, it would be impractical to assess actual damages to a city for each individual action or default by a contractor such as failing to correct a missed pickup or repeated customer service failures. Therefore, waste collection contracts often include provisions for liquidated damages to substitute a predetermined cost for assessment of actual damages. The challenge of these clauses is in their enforcement by municipalities. At their core, liquidated damages should serve as a timely deterrent for a contractor cutting corners, but often due to lax incident tracking, and lack of monitoring, liquidated damages are applied in lumps for significant time periods damaging the contractor-city relationship and not positively impacting contractor performance as detailed in the 2011 waste industry article "Waste Collection Contractors Beware"².

1.4 Labour Rates

Labour rates in Alberta are typically higher than other provinces. The labour rates in Alberta increase dramatically when the economy is strong, and this drives the cost of services across all sectors in the province. The economy in Alberta is known to cycle through highs and lows. This creates an inherent risk for the private sector trying to predict and guarantee a sustainable labour rate that would span the life of a collection contract.

Labour rates in the public sector are typically higher than the private sector. When the economy grows in Alberta, the labour rates for the private sector increase due to market demand. This becomes a risk for private sector waste haulers who need to guarantee collection rates over the life of their contract. If the firm is unable to physically or financially deliver the service, they will need to default on the contract or renegotiate a higher rate that is competitive with the rest of the industry to attract skilled workers. In the event a contractor defaults on its contract obligations, there will be liquidated damages that the city can claim but in the meantime the collection service will suffer, and customers will express their displeasure to the city.

In a 2018 article, the Canadian Centre for Policy Alternatives in Manitoba³ summarized concerns for the working conditions of labourers hired through temporary help agencies by one of the City's previous collection contractors. The article claims that labour standards for these temporary workers did not meet legislative requirements and

¹ Recent guidelines include "Is Your Waste Contract Putting Your Municipality at Risk? Best Practices in Municipal Waste Contracting" from the U.S. based In the Public Interest.

² An article published by Waste 360 in 2011 warned waste collection contractors about the challenges with public contracts.

³ The Canadian Centre for Policy Alternatives Manitoba Office published the article "Trashed: How Outsourcing Municipal Waste Collection Kicks Workers to the Curb" in February 2018 following the City of Winnipeg's fall 2017 award of solid waste collection services to two contractors who had not held the previous contract.

suggests that in-house services would provide more stable, safe, and healthy jobs in the City (Winnipeg). When labour rates are higher in the private sector, the benefits of in-house services would be an important consideration for skilled workers to not seek employment elsewhere.

The data sample from Ontario and BC indicated rates average 8% behind the Alberta market and 18% behind The City of Calgary drivers.

1.5 Publications

WRS is sometimes asked to demonstrate their service efficiency and effectiveness, and whether there would be cost savings in outsourcing segments of its residential collection services. This largely stems from an attitude that *“the private sector can do it better”*. A 2010 article from C.D. Howe Institute⁴ further implies that municipalities can have savings through outsourcing collection services.

While the general consensus amongst industry research is that some level of competition in service provision provides value by increasing innovation and keeping costs down, few argue that the private sector will always out-compete the public sector. Indeed, this view is espoused by the previously referenced C.D. Howe Institute article which argues that it is innovation rather than privatization that drives costs down⁵. In a response to this article⁶, the Canadian Union of Public Employees (C.U.P.E.) identifies a number of areas where the article’s analysis is inconclusive as to the relative cost of public and private costs and identifies a number of municipal studies that have concluded that costs are comparable with either entity providing services.

A United Nations Development Program (UNDP) article⁷ echoed the idea that contracting services can increase efficiency but cautioned against the notion that private actors could universally achieve greater efficiency than the public sector as other characteristics of collection such as geographic characteristics had a greater influence.

1.6 Industry Scan Summary

There is no apparent major trend toward private or public delivery of waste collection services in North American municipalities at this time. Indeed, privatization is an often-debated topic within the industry with groups dominated by private haulers arguing for contracting services, and groups dominated by the public sector arguing for greater public-sector control. A 2011 waste industry article⁸ summarized that “the private versus public debate should be judged largely on a case-by-case basis” and made an argument for municipalities using managed competition as a catalyst to increase efficiency and define the scope of their collection services for both public and private sector bidders.

Increasingly municipalities are choosing approaches that eliminate monopolies of services by either the public sector or a single private contractor. In larger municipalities this tends to take the form splitting services based on

⁴ The C.D. Howe Institute’s Commentary No. 308 “Picking up Savings: The benefits of Competition in Municipal Waste Services” argues that municipalities with waste collection services primarily provided by municipal staff could decrease costs by contracting more services.

⁵ The report states “Privatization alone does not reduce costs, but much evidence shows that the existence of a competitive tendering system results in cost savings provided by either public employees or private contractors.”

⁶ The Canadian Union of Provincial Employees’ article “Garbage In, Garbage Out: the real costs of solid waste collection” identifies that the per tonne and per household cost of solid waste collection in Ontario does not indicate that contracting more services results in lower costs to consumers.

⁷ The United Nations Development Program article “Is the Private Sector More Efficient? A cautionary tale” sites a Japanese study of waste collection efficiency from 2013 that concluded private participation could increase efficiency in some situations.

⁸ An article published by Waste360 in 2011 “Private Benjamins: The Debate Over Privatizing Waste Collection” summarized the public debate occurring in the United States at the time between the National Solid Waste Management Association and the Solid Waste Association of North America.

location or materials collected. This approach allows municipalities to encourage and increase competition for their collection services and protects against the risk of not being able to replace a private contractor who cannot fulfill the requirements of the contract by either maintaining internal City resources who can step in to provide service and/or maintaining relationships with multiple contractors who can take on extra work if required. In municipalities where only one potential private collection contractor exists (frequently in small or remote communities), the public sector often chooses to retain collection services to maintain control of costs and in recent years many smaller municipalities have moved from contracted service to in-house collection services due to increasing contract costs.

Large municipalities are increasingly using mixed service delivery models to encourage ongoing innovation and competition amongst private sector contractors and public sector service providers. These processes can be initially onerous for municipal staff and have associated costs. They provide citizens and politicians a level of confidence that collection services are efficient and cost-effective. In North America, the public sector often wins these competitions⁹.

Municipalities are particularly vulnerable to private sector contractors dictating prices where infrastructure such as landfills and transfer stations are privately held. WRS's landfills enable them to not be reliant on the private sector for solid waste infrastructure.

1.6.1 Automated Collection

As discussed in Section 3.2.1, there is a trend toward automated collection in municipalities wherever possible. In some cases, commentators have estimated significant cost savings from municipalities switching from manual to automated collections. In a 2014 report, the New York Citizens Budget Commission¹⁰ estimated that The City could reduce injury rates and improve productivity by switching from the demanding physical labour required in manual collection for a total cost savings of \$10 to \$22 million per year.

1.6.2 CNG Collection Vehicles

There is a trend to using CNG collection vehicles. Although it is approximately 10% more to purchase a CNG collection truck, adoption of CNG trucks could cut fuel costs in half¹¹. As noted above, Waste Management Inc. (arguably the largest private sector waste management provider in North America) aspires to have more CNG vehicles, which save an estimated 8,000 gallons of diesel fuel, worth approximately \$31,000, per truck per year. Therefore, most major service providers that have access to CNG fueling stations or are willing to build in their own, are in the process of transitioning their fleet to the new fuel (from Henry Ford Research Fund¹⁰).

1.6.3 Contracted Services

Siting studies published from 2004 through 2008¹², the Toronto Environmental Alliance (TEA) study of waste collection (2011) estimated that proper monitoring for waste collection contracts costs about 20% of the annual contract cost to achieve high performance levels. Monitoring contractors should be considered when estimating the

⁹ The C.D. Howe Institute's Commentary No. 308 "Picking up Savings: The benefits of Competition in Municipal Waste Services" argues that municipalities with waste collection services primarily provided by municipal staff could decrease costs by contracting more services.

¹⁰ In its September 2014 article "Getting the Fiscal Waste Out of Solid Waste Collection in New York City", the New York Citizens Budget Commission suggests that there are significant opportunities for savings in changing a portion of its collection to automated trucks.

¹¹ Waste Management Services Industry, prepared by The Henry Ford Research Fund, Dated February 11, 2014

¹² The Toronto Environmental Alliance report cites several studies including "Privatization and Its Reverse: Explaining the Dynamics of the Government Contracting Process" (2004), "Municipal Service Contract Administration Booklet" and "Managed Competition in Indianapolis: The Case of Indianapolis Fleet Services" (2005).

total cost of service. The study further references the City of Toronto's data that costs for The City's privately contracted waste collection areas increased much more quickly than public collection costs.

Quote:

"The City of Phoenix uses the "go away" cost analysis. Under this approach, the primary factor is the impact of contracting on the department budget. The city's bid is determined by evaluating what city costs would "go away" if a private firm were awarded the contract and then calculating the city's cost of providing those go away elements. This process has gained credibility over a period of time as having the best evaluation of the impact on the taxpayers receiving the services. " – Managed competition: A tool for achieving excellence in government¹³.

¹³ Jensen, R. (1995). Managed competition: a tool for achieving excellence in government. Retrieved June 2018, from <https://msu.edu/course/prr/371/Privatization%20and%20Downsizing/competition.html>

1.7 Collections Industry Strategic Analysis

This section provides a strategic analysis of the waste collection industry's competitive dynamics, including an analysis of competitive advantages between WRS and the private sector. Strategic industry analysis is performed to:

1. Assess the level of competitiveness across the waste collection industry private sector; and
2. Evaluate how well the private sector is positioned to compete vs. WRS.

1.7.1 Industry Competitive Dynamics

From a variety of waste collection industry research, the following observations are made:

1. **It functions as an Oligopoly¹⁴:** the market share is dominated only by a few, large companies. These companies compete across national / international market locations. Additionally, the market is particularly prone to consolidation, as there are significant barriers to entry for new / smaller market players.
 - Over the mid-to-long term, oligopolies tend to moderate the degree of price competition amongst market players.
2. **Competition is focused on integrated price leadership and service quality differentiation:** Entities compete for contracts both within local markets and across regions (multipoint) primarily on:
 - Price (Integrated Cost Leadership – leverage economies of scale and scope); and
 - Service Differentiation (reliability, timeliness, and environmental).

In the short-term, the industry can feature intense rivalry and price competition. It has been observed that companies will “low-ball” contracts in order to win the work and gain entry to the local market.

In the mid-to-long term, however, it has also seen a tendency to deploy a “fat-cat” pricing strategy. In this scenario, the market leaders will develop similarly price-oriented strategies, rolling out disciplined price increases in order to maintain positive revenue even against rising costs. This is consistent with the oligopoly market structure.

Based on this, there is promise that WRS may elicit an aggressive bid from a vendor wanting to win the work but may not be likely to maintain these initial cost savings. Caution is advised for future contracts given this oligopoly structure.

1.7.2 Market Trends

Similarly, a review of a variety of market research, news articles, and industry thought leadership papers has identified the following market trends for the collections industry:

1. The market is generally growing across North America, as the amount of collection services demand generally grows with the population and economy.
2. Within this market, there is generally growing demand for:

¹⁴ Karen Joyce, “Waste Collection Services Competitive Analysis”, 2015

- Automated cart-based collection systems;
 - Curbside recycling and organics collections; and
 - Enhanced environmental outcomes (i.e. limiting greenhouse emissions).
3. There has been a general trend for municipalities outsourcing (at least) portions of their residential collection network.
 4. There is a general shortage of qualified truck drivers across North America, which has led to repeated instances of curbside collections instability and unreliability within select cities.
 - It is noted that the 2018 labour study completed by The City indicates that the demand for drivers within Alberta is currently lower than historical levels. However, it is further noted that this demand can increase sharply upon an upswing in the provincial economy.

These market trends suggest that, in the medium-to-long term, the private sector may be at risk to the general industry labour shortage. This will put pressure on the private sector entities with lower total wage and benefit packages to reliably provide collection services for large contracts. In addition, the general growth of the market and increased trends in municipalities choosing to outsource will tend to decrease the level of price competition within the market.

1.7.3 WRS' Competitive Position

In review of the collections industry, key organizational resources were identified upon which companies use to compete and win within their selected markets. These key resources included the following:

1. Development and deployment of technology.
2. Vertical integration / market synergies.
3. Attraction and retention of skilled labour.
4. Fleet management practices.

Based on these sources of competitive advantage, an analysis of WRS vs. a potential private sector entity was developed. It is summarized in the following table:

Resource	Advantage	Comments
Technology	Private Sector	<ul style="list-style-type: none"> ▪ Natural Gas Vehicles. <ul style="list-style-type: none"> - Lower Greenhouse Gases (GHGs). - Improved fuel economy. ▪ Route Design / In-Truck Technology. <ul style="list-style-type: none"> - More efficient beats – more households (HHs) per route.
Vertical Integration / Synergies	Neutral	<ul style="list-style-type: none"> ▪ Both WRS and Vertically-Integrated Private Sector Entities have economies of scale and scope advantages within Calgary.
Attraction & Retention of Labour	WRS	<ul style="list-style-type: none"> ▪ General driver shortage (across North America). ▪ Historically The City has had an effective and positive relationship with Union. Identified for offering an attractive total compensation package. ▪ WRS trucks feature increasing levels of driver ergonomics.

Fleet Management	Private Sector	<ul style="list-style-type: none"> ▪ Select large firms can exert higher purchasing power. ▪ Private sector can optimize fleet management across their entire operations (including commercial) and increase asset utilization. ▪ Larger firms can focus on a greater level of asset standardization, adoption of lean methods, and increased focus on fleet efficiencies.
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The findings from this analysis include:

1. **Short-Term:** it is reasonable to conclude that, in the short-term, the private sector can provide reliable, cost effective services and provide a comparable alternative to internal WRS resources.
2. **Medium-to-Long Term:** the private sector may be challenged by higher labor costs and inability to effectively retain labour to the degree which The City can, which can lead to higher risks of service unreliability.