Automated Cart Collection
What Have We Learned

Gary Everett, CIF
Autocarts

- Carts available for >30 yrs.
- 16 municipalities (munis) in CA & 27 in USA use auto-cart collection
- ~10 munis in Ontario have switched
- CIF seeing growing interest by other munis
- Is autocart collection the next big thing?
- What have we learned so far?
Today’s Presenters

- George South - Progressive Waste
  - Advocating for Change: What's to be Gained

- Trevor Barton - Peel Region
  - Case study: Why/How Peel Made the Switch

- Laurie Westaway – Wasteaway
  - CIF Project 888 – Automated Cart Recycling: A Study of Municipal Collection & Operations in Ontario
Automated Collection – Why Does it Matter?

George South - Ontario Region
Progressive Waste Solutions
Overview

- Safety is the overriding priority – Agree or Disagree?
- TRIR (Total Recordable Incident Rate)
  - Rate of injury per 200,000 operating hours
- Simcoe County vs. Peel
- Rear-load vs. Peel
How To Become Best In Class - Planning For Success

Operational model leads to:

- The right type of trucks
- Use of appropriate technology
- Labour/supervisory competency
- Maintenance standards
- Procedures leading to safety culture outcome

Priorities

Investments in:

- Safety – essential & translates into our community & organization
- Training, role definition & responsibility
- Maintenance programs & systems
Equipment: Present & Future

- Present
  - rear-loader has been king
  - most ubiquitous & productive curbside vehicle in N.A.

- BUT...nothing has really changed since the 1960’s

- Today’s workforce:
  - lack of desire to work physically
  - older
  - very aware of alternatives
  - sedentary focus
Equipment: Rear-Loaders Put Drivers In Harm’s Way
Why Has This Collection Model Stood For So Long?

- **Pros**
  - productive; dependable; fewer moving parts
  - adaptable for changing waste streams
  - capital & operating costs lower than other options

  **SUMMARY – ITS CHEAP!**

- **Considerations**
  - safety issues
  - WSIB: rear-loader is a young-person’s game
So, What Do We Do?

- Do we agree that manual collection is inherently dangerous?
- Do we agree that our workforce is changing?
- Do we agree that young people have far more options today than in the past – options that are far less strenuous on the body?
- What are some alternatives?
Alternatives

Automated Side-loaders: more productive but infrastructure-dependent

Automated systems for single & 2 - stream
Overview: ASL Trucks

- **Pros**
  - ASL comes in single or co-collection form; based on:
    - waste stream splits
    - distance to transfer/landfill/processing
    - whether multiple streams means multiple tip facilities

- **Considerations**
  - ergonomic constraints: driving ahead & looking behind at all times/split attention
  - little to no opportunity to handle bulky items
  - need for “chaser” truck

- There is 1 more option
Equipment: Other Automated Options – “Curotto-Can”

Single or 2-stream trucks; front box can split longitudinally to accommodate different streams.
Overview: “Currotto-Can” Automation

- Pros
  - High productivity
  - Can pick up carts & manual loads
  - All activity takes place in front of driver on curbside
  - Truck between public & driver
  - Driver in cab; eyes forward
  - Ease of overflow & bulky item loading

- Considerations
  - Higher capital cost
Height & Road Density Considerations

Like all equipment there is a proper application.

This unit is not meant for “416” density, but perfectly suits the “905”
Recruitment Case Study

- Candidate Screening (1 Day)
- Ride Along Skill Assessment (1/2 day)
- Work Well Screening (1 day)
- Third Interview (1/2 day)
- Smith System Driver Training (3 Day)
- Driver Training Academy Curriculum (5 Day)
- On Board Vehicle Training (5 day)
- Review & Re-assessment
- First Day

Average lead time is 16 days for complete training
Peel Compared to Simcoe County – Small Case Study

**Peel**
- ~ 70 trucks
- All CNG
- 121,000 HH

**Simcoe**
- ~70 trucks
- All CNG
- 130,000 HH
## Safety Performance

<table>
<thead>
<tr>
<th></th>
<th>Peel</th>
<th>Simcoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Recordable Incident Rate = 0.00</td>
<td>Total Recordable Incident Rate = 33.6</td>
<td></td>
</tr>
<tr>
<td>Most prevalent injury - None</td>
<td>Most prevalent injury – over exertion/sprains/strains/cuts</td>
<td></td>
</tr>
<tr>
<td>Safety cost/month = $15,000</td>
<td>Safety cost/month = $60,000+</td>
<td></td>
</tr>
<tr>
<td>Lost Time = 0</td>
<td>Lost Time = 4.97</td>
<td></td>
</tr>
<tr>
<td>WSIB – rebate position</td>
<td>WSIB – surcharge position</td>
<td></td>
</tr>
</tbody>
</table>
## Productivity Performance

<table>
<thead>
<tr>
<th>Peel</th>
<th>Simcoe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Waste – first place by 8%</td>
<td>Waste – second place</td>
</tr>
<tr>
<td>Recycle – first place by 12%</td>
<td>Recycle – second place</td>
</tr>
<tr>
<td>Organics – newly automated cart use</td>
<td>Organics – n/a</td>
</tr>
<tr>
<td>Bulk – mix of ASL &amp; R/L</td>
<td>Bulk - same</td>
</tr>
<tr>
<td>L&amp;Y – R/L</td>
<td>L&amp;Y – R/L</td>
</tr>
</tbody>
</table>
MRF Quality Impacts

Material quality is a legitimate concern

Remember the concerns regarding
- 2 stream from 5 stream
- single stream from 2 stream &
- blue box to blue bag
As with all system changes as we move from manual sorting/collection to more mechanical options we need to maintain our ability to innovate & develop work-arounds including pre-screening & pre-sort options
Summary: Future Predictions

- Rear-loader significance will decline in our industry
- Where there are carts there will be automation
- Safety focus will drive activity in front of operator
- Older workforce will be a factor in the drive toward automation
- Efficiency will drive special collections to be combined (bulky items)
  - necessitates adaptable truck body design
- Evolution in cart systems
  - Front-load automated collection, powered by CNG where there is a local desire
Make the leap and go automated!

For more information:

George South, Progressive Waste Solutions
Division Vice President, Central Canada
george.south@progressivewaste.com
www.progressive.com
Automated Cart-based Collection: Is it Right for All Municipalities
CIF Project #882

D. Trevor Barton
Region of Peel
Project Highlights

- **Overview**
  - January 4, 2016: curbside waste collection services changed from weekly, manual collection to bi-weekly, cart-based collection

- **Project Goal**
  - Improve overall participation & diversion in curbside waste collection programs while keeping residue levels low

- **For more information**
  - Trevor.Barton@peelregion.ca
  - www.peelregion.ca/waste
Why Cart-Based Collection?

- Research & the results of a year-long pilot project were used to make an evidence-based recommendation for Regional Council’s decision to move to bi-weekly, cart-based waste collection.

- Main reasons for the recommendation:
  - Environment:
    - It will reduce the amount of waste sent to landfill
    - GHG emissions will decrease with fewer collection vehicles on the roads
  - Financial: It will reduce the annual waste collection costs to the Region
  - Safety: Cart-based collection programs are associated with a reduction in worker injuries
Impacts: Details & Highlights (1)

- Initial Key Impacts
  - **Environment:**
    - Reduction of waste sent to landfill: 101% increase in organics tonnes collected from January to March 2016 compared to 2015
    - Increased organics participation from 35% to 50% in January 2016
    - Fleet reduction by up to 22 vehicles deployed daily
    - Brand-new compressed natural gas (CNG) vehicles will reduce greenhouse gas emissions by approximately 25% compared to diesel
    - Focused resident education, outreach and communications about the new program helped to reiterate the importance of diversion & proper participation in the Region’s waste management programs.
    - 2016 1st quarter review indicates that there are cart contamination issues at the MRF that need to be addressed immediately
  
  - **Financial:** Estimated annual collection savings of approximately $5.8 million
Impacts: Details & Highlights (2)

- Key Impacts Continued
  - Safety: Anticipated reduction in worker injuries from switching to automated collection
  - Aesthetics: Reduction in windblown litter from changing recycling boxes to lidded carts
  - Processing: Recycling materials are protected from rain and snow – drier & easier to process, lesser impact on equipment & lesser maintenance cost for repair & replacement, however, hidden incorrect materials in recycling carts are challenging
  - Convenience/Benefit to Resident:
    - Carts have wheels, making it easier for residents to transport waste to the curb, with less trips
    - Carts can provide increased capacity to accommodate the bi-weekly collection schedule
    - Continued weekly organic cart collection ensures that “stinky” items are collected every week
    - Carts are pest resistant
Contamination Strategy: What’s Being Done?

- Based on 1st quarter results for 2016 there is an estimated 2,600 tonne increase in Residue required to be managed from the MRF for 2016 vs. 2015. This is a 2.6% increase in Non-Recyclable material received at the MRF. It also represents an urgent possible 22% increase in Residue being shipped from the MRF.

- Collection vehicle audits at the MRF.

- Short-term & long-term strategy addressing increasing amount of Home Health Care Waste & partnerships with CCAC, Peel Public Health, health teaching facilities, Canadian Diabetes & home health care (kit) retail suppliers.

- Communication support for proper use of recycling carts.

- Reallocated 6 staff to conduct curbside waste audits.
Challenges: The Anticipated

- Project size & scope
- Tight timelines:
  - To procure cart vendor, manufacture & deliver carts
  - Communications to residents
- Public awareness of the program changes & cart selection timeframe
- Digital-first communication & removal of traditional customer contact
- March of Progress marketing campaign
- Political will
- Public acceptance of changes
- Volume of resident complaints & inquiries
- Resident cart storage until 2016 start date
- Continued education support for program changes
- Siting of CNG fleet yards
- New contractors (collection & cart)
- Contamination level increase & mitigation
Challenges: The Unexpected

- Collection calendars (colour vs. black & white)
- New Customer Relations Management tool (Salesforce)
- Political will
- Tip trucks not all ready for the start the program
- Kitchen containers being left inside the carts during the first collection cycle
- Size of the organics cart & freezing locks
- Media popularity of vermin
  - Squirrels & the organics cart
- Contamination levels of MRF materials
Costs to Launch to Program

- 27 contracted dedicated waste staff Support services
  - 21 Contracted Curbside Advisors+ 6 FTE dedicated staff
- Customer Contact Centre
  - Digital team; website re-launch, videos, multi-channel support
  - Education & Outreach Strategy
- Dedicated communications support
  - Print & digital content
Lessons Learned

- Manage expectations with key stakeholders
- Ensure there is a system in place to document issues/concerns to review at a later date (e.g. Salesforce)
- Ensure staffing is equipped with the proper tools to address concerns
- Ensure that you have flexibility to address high priority concerns that come in from Councilors' offices
- Ability to respond & rectify contamination issues
Automated Cart Recycling: A Study of Municipal Collection & Operations in Ontario

CIF Project #888

Laurie Westaway
Project Highlights

- Project goal: consider if auto-cart transition benefits outweigh costs
- Impacts: evidence from 7 ON municipalities re: carts vs. manual curbside collection
- More information:
  - laurie@westaway.ca, robins.environmental@sympatico.ca
  - Download the full project report: http://cif.wdo.ca/projects Project #888
Purpose to Study Questions Asked?

- **Collection**
  - Efficiencies & costs

- **Capacity**
  - Recyclable materials & participation

- **Health and Safety**
  - Claims & costs
Report Overview

- Collection design considerations
- Operations
  - Collection efficiency & challenges
  - Processing implications
- Financial implications
- Resident feedback
- Program planning & implementation
- Promotion & education
- Recycling impact
Collection Efficiency

- Single-stream
- Co-collection
- Bi-weekly
<table>
<thead>
<tr>
<th>Ontario Single Stream Municipalities 2010 – 2014 (5 years as applicable)</th>
<th>Average Collection Costs per Marketed Tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carts – 5 Municipalities</td>
<td>$235.28</td>
</tr>
<tr>
<td>Non-Cart – 12 Municipalities</td>
<td>$272.08</td>
</tr>
<tr>
<td>Difference</td>
<td>$36.80</td>
</tr>
</tbody>
</table>
Capital Expenditures

- **Cost/truck +30%**
- **Carts**
  - Capacity (vol. & weight)
  - Purchase ($40-$60/hh)
  - Deploy ($3-$5/hh)
  - Promote ($3.50-$5/hh)
  - Store & replace (1-3% annually $65-$100/cart)
  - Ongoing P&E & enforcement
Labour

- Lower labour costs
- Diverse workforce
- Enhance available services?
Impact on Recycling (1)

- Marketed recycling
  - 6 out of 7 programs rates improved 1-3%
  - Region of Peel: 3 months

<table>
<thead>
<tr>
<th>Recycling</th>
<th>+5%</th>
<th>Organics</th>
<th>+106%</th>
<th>Garbage</th>
<th>-12%</th>
</tr>
</thead>
</table>

- Improved Participation as residents appreciate:
  - Ease of use
  - Storage capacity
  - Convenience
Impact on Recycling (2)

- **Collection monitoring**
  - Reduced visual/handling
  - Requires directed P&E & strong feedback

- **Residue rates**
  - ~5-6% increase (over 20%)

- **Processing costs**
  - ~27% more
## Processing Costs – Datacall

<table>
<thead>
<tr>
<th>Ontario Single Stream Municipalities 2010 – 2014 (5 years as applicable)</th>
<th>Average Processing Costs per Marketed Tonne</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carts – 5 Municipalities</td>
<td>$142.58</td>
</tr>
<tr>
<td>Non-Cart – 9 Municipalities</td>
<td>$112.12</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td><strong>$-30.46</strong></td>
</tr>
</tbody>
</table>
Examples ...

- Sault Ste. Marie first dual/two compartment recycling system in ON
  - Datacall – 3% increase in marketed tonnage

- City of Guelph
  - Net savings of $230,000 (crew, vehicles, & WSIB)

- Region of Peel launched January 2016
  - Reduced collection fleet by 15-20%
Key Learnings

- Recycling composition
- Jurisdiction over all waste streams
- Ability to collect/process Single Stream
- Availability of reserve monies
- Current contracts and/or fleet replacement
- Capacity to implement engaging multi-faceted communications