



Listening to your Bins

How Fullness Data Drives Efficient Collection Systems

April 23, 2026



Introductions

Jeff Gunderson

Systems Technician – City of Lethbridge

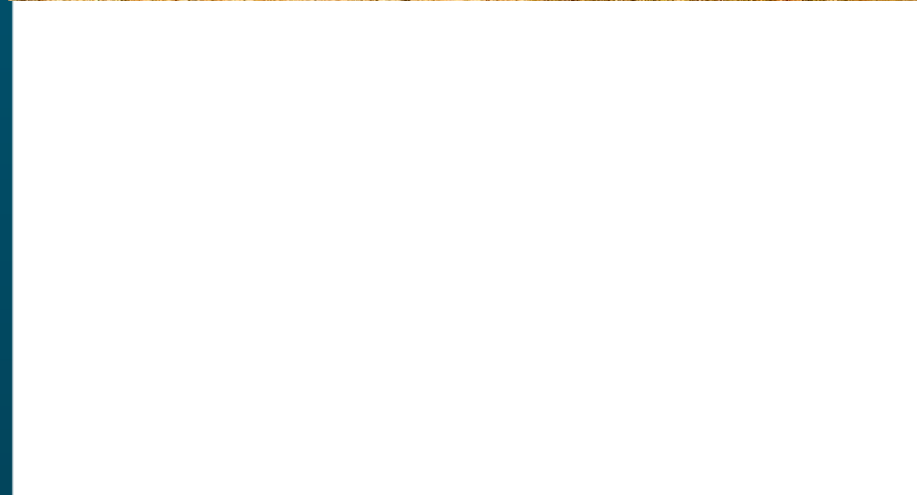
James Nicholls

Collections Manager– City of Lethbridge



A Little About Lethbridge and Waste Collection

- 115,000 people (4th largest in Alberta)
- 11.2% population increase in past 5 years
- 35,000 curbside customers as well as 7500 multi-unit customers
- 3 green waste/recycling drop-off sites
- Offer commercial waste collection as well



The Search for Solutions

What was required?

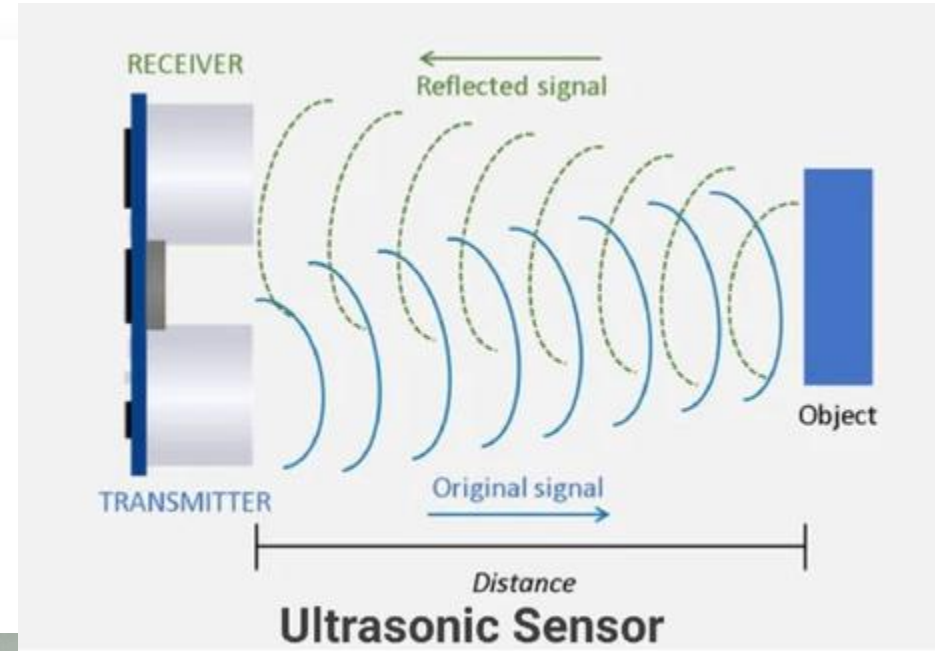
- Technology that could provide fullness information to Collections staff so they could allocate staff/equipment appropriately
- Solution had to be:
 - Capable of providing timely updates on container fullness, with information easily accessible by staff each morning
 - Capable of working in wide range of temperatures and resistant to damages
 - Priced such that upfront and ongoing costs did not outweigh the optimized route savings





What we Found

- European sensor company
- Just entering the North American market; numerous users in European market
- Ultrasonic sensor technology – distance between sensor and objects in bin used to calculate fullness





First Steps

- Recycling Depots
- Roll Off Bins
- Why Start Here?

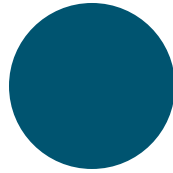


Installation

- Small Units
- Easy to Mount/Exchange
- Configuration on App Easy

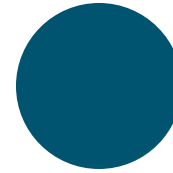


First Few Months of Use



Pros

- Performed well in cold weather climates – no issues with readings in -30C
- On-site comparisons between readings and visual audits confirmed accuracy in most cases



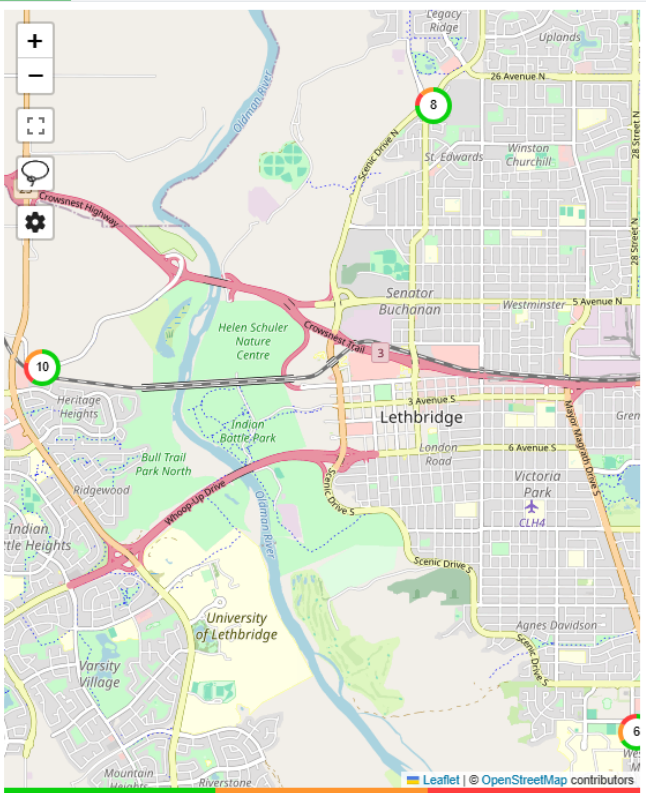
Cons

- Some accuracy issues arise when large cardboard items are in bins
- Initial hiccups with our installation led to some sensors reading too often and using battery far faster than expected
- Configuration issues before arrival

Sample Data from Interface

Bins Routes Feedback History

Itinerary planning Add collection plan Export all Columns Clear



Stand code	Stand fill level	City	Address	Bin code	Device EUI	Bin fill level	Trash type	Status
Roll Off		Selected 0					Selected 0	Selected
Roll Off 2	98%			Roll Off 2		98%	PAPER	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 5	96%			Roll Off 5		96%	PAPER	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 15	84%			Roll Off 15		84%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 4	82%			Roll Off 4		82%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 27	72%			Roll Off 27		72%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 23	69%			Roll Off 23		69%	PAPER	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 9	68%			Roll Off 9		68%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 8	66%			Roll Off 8		66%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 22	65%			Roll Off 22		65%	COMMUNAL	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 17	60%			Roll Off 17		60%	Metal	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 16	47%			Roll Off 16		47%	GLASS	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 25	43%			Roll Off 25		43%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 10	36%	Lethbridge (T1J 0P6)	4 Ave N	Roll Off 10		36%	Metal	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 6	35%			Roll Off 6		35%	Metal	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 26	26%			Roll Off 26		26%	PLASTIC	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 11	17%			Roll Off 11		17%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 21	13%			Roll Off 21		13%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>
Roll Off 0	10%			Roll Off		10%	Cardboard	<input checked="" type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>

Next Steps

- Corporate Containers
- Pedestal Containers in Pedestrian Walkways





Next Steps - Using the Data

- Integration between Cityworks (current work management system for commercial work) and data from sensors
- Fullness reading updates each day at 5am
- Corporate containers emptied only when over certain fullness threshold

Overhead Garbage Routes List for Distribution to Crews - Use 'Submit To' to Push to Employee Completing Work

W&R - Weekly Overhead Garbage Inspections - New/Active

Open Print Expand Configure Map Search...

<input type="checkbox"/>	Insp	Status	Submit To	Location	Initiate Date	Cond Score
<input type="checkbox"/>	1294494	IP		Ohw - Helen Schuler Nature Centre FORKS DOWN UNDER WHOOP UP BRIDGE (Thurs) - 300 Indian Battle Rd - 12-FS-2-126	03/26/2026 7:17 AM	95
<input type="checkbox"/>	1304367	OPEN		Ohw - Legacy Parks Depot (Mon/Thurs) - 400 Blackwolf Blvd - 04-FS-6-626	04/13/2026 10:10 AM	73
<input type="checkbox"/>	1304392	OPEN		Ohw - Transit - (Mon/Wed) - 500 3 AVE N - 07-FS-4-862	04/13/2026 10:11 AM	72
<input type="checkbox"/>	1303294	OPEN		Ohw - Westside Firehall (Fri) - 10 JERRY POTTS BLVD - 90-FS-4-130	04/10/2026 6:34 AM	66
<input type="checkbox"/>	1302137	OPEN		Ohw - Firehall #3 (Wed) - 2614 16 AVE S - 19-FS-4-319	04/8/2026 9:31 AM	54
<input type="checkbox"/>	1302645	OPEN		Ohw - Library Downtown (Thurs) - 810 5 AVE S - 19-FS-6-172	04/9/2026 6:42 AM	53
<input type="checkbox"/>	1294467	OPEN		Ohw - Civic Ice (Thurs) - 911 6 AVE S - 12-FS-6-075	03/26/2026 7:06 AM	51
<input type="checkbox"/>	1304104	OPEN		Ohw - Dean's Bin - (Mon/Thurs) - 500 4 AVE N - 07-FS-6-469	04/13/2026 6:45 AM	48
<input type="checkbox"/>	1304388	OPEN		Ohw - City Stores - (Mon/Wed) - 500 4 AVE N - 89-FS-6-217	04/13/2026 10:11 AM	45
<input type="checkbox"/>	1299866	OPEN		Ohw - Labour Club Ice (Thurs) - 2020 18 AVE N - 97-FS-6-479	04/2/2026 8:39 AM	45
<input type="checkbox"/>	1302867	OPEN		Ohw - Firehall #4 (Thurs) - 2825 5 AVE N - 02-FS-4-216	04/9/2026 8:47 AM	44
<input type="checkbox"/>	1304390	OPEN		Ohw - Facility Services - (Mon/Wed) - 500 4 AVE N - 04-FS-6-629	04/13/2026 10:11 AM	41
<input type="checkbox"/>	1303566	OPEN		Ohw - Crossings Library (Fri) - 255 BRITANNIA BLVD W - 23-FS-4-518	04/10/2026 9:44 AM	40
<input type="checkbox"/>	1304387	OPEN		Ohw - W&E Trailer - (Mon/Wed) - 500 4 AVE N - 02-FS-4-085	04/13/2026 10:11 AM	40
<input type="checkbox"/>	1302855	OPEN		Ohw - Henderson Lake Playground (Thurs) - 3430 PARKSIDE DR S - 10-fs-6-032	04/9/2026 8:47 AM	40
<input type="checkbox"/>	1304232	OPEN		Ohw - (E) Mountainview Cemetery - (Mon) - 1210 SCENIC DR S - 92-FS-6-438	04/13/2026 8:22 AM	30
<input type="checkbox"/>	1304103	OPEN		Ohw - Black Plastic Bin North of W&E Shop (Mon/Wed) 05-FS-6-001	04/13/2026 6:45 AM	30
<input type="checkbox"/>	1303569	OPEN		Ohw - Curling Club (Fri) - 300 BRITANNIA BLVD W - 11-FS-6-065	04/10/2026 9:44 AM	28



Collection Issues Revisited

- Inefficient Fixed Routes – Freedom to Make Changes Daily
- Unnecessary Operational Costs – Trucks and Employees not making Unnecessary Stops
- Environmental Impact – Less Fuel Used While Making Fewer Stops
- Missed Opportunities with Resources – Operators and Vehicles More Available for Other Work
- Limited Pay Rates - Competitive Rates, Charge By Dump Instead of Fixed Monthly Rates



Where to Go from Here

- Opportunities for commercial pay-as-you-throw – only pay when container reaches agreed-upon fullness threshold
- Monitoring fill patterns to accommodate collections schedules – allows for more informed discussions with customers when considering optimal scheduled collections



Questions?