



Sensor mounted inside bin

Investigating benefits & limitations of smart technology

TO IMPROVE WASTE COLLECTION IN METRO VANCOUVER

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<https://orbit.gvrd.bc.ca/orbit/llisapi.dll/app/nodes/51871262>

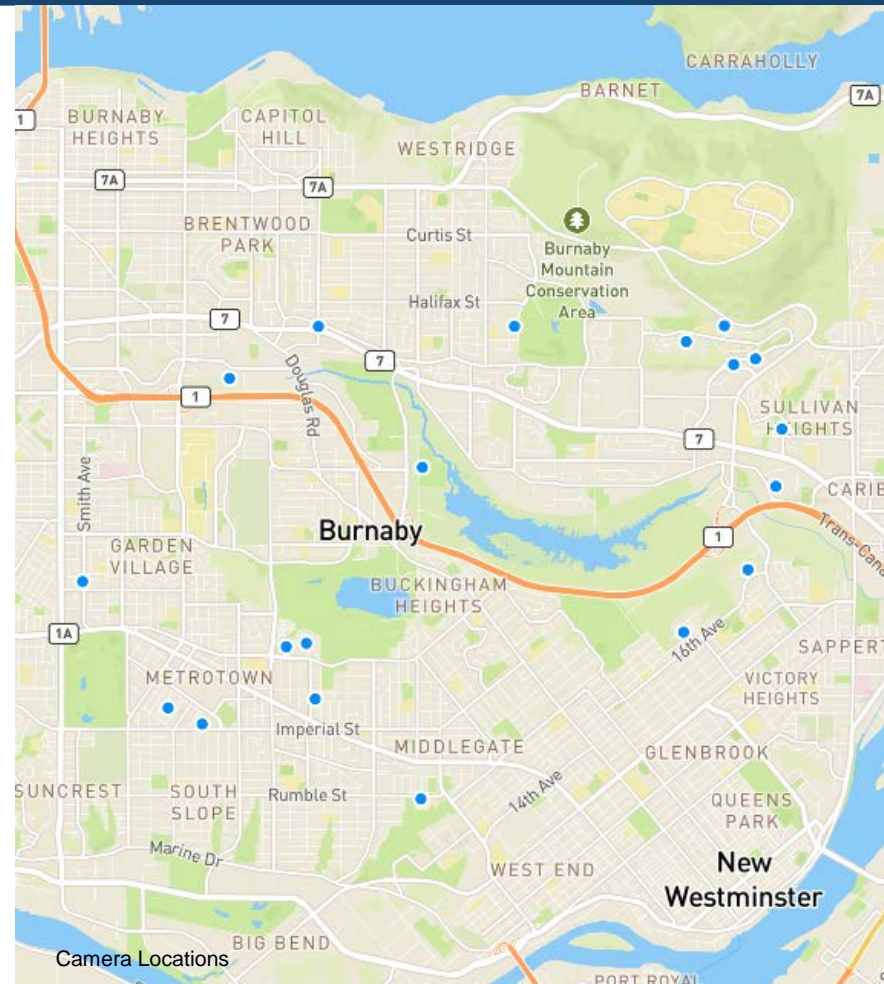


DILLON
CONSULTING

metrovancouver

THE PILOT

- 20 sensors in the City of Burnaby's MF collection bins
- 3 month pilot
- Banned item detection
- Fullness monitoring
- Human visual audits



CAMERA BASED SENSORS

**Contamination
Monitoring**

**Service
Confirmation**



**Fullness
Monitoring**

**Customized
Reports**

BANNED ITEMS



Bulky Items



Wire, hosing, rope, and cable >1m



Electronics



Foam Packaging



Construction & Yard Waste

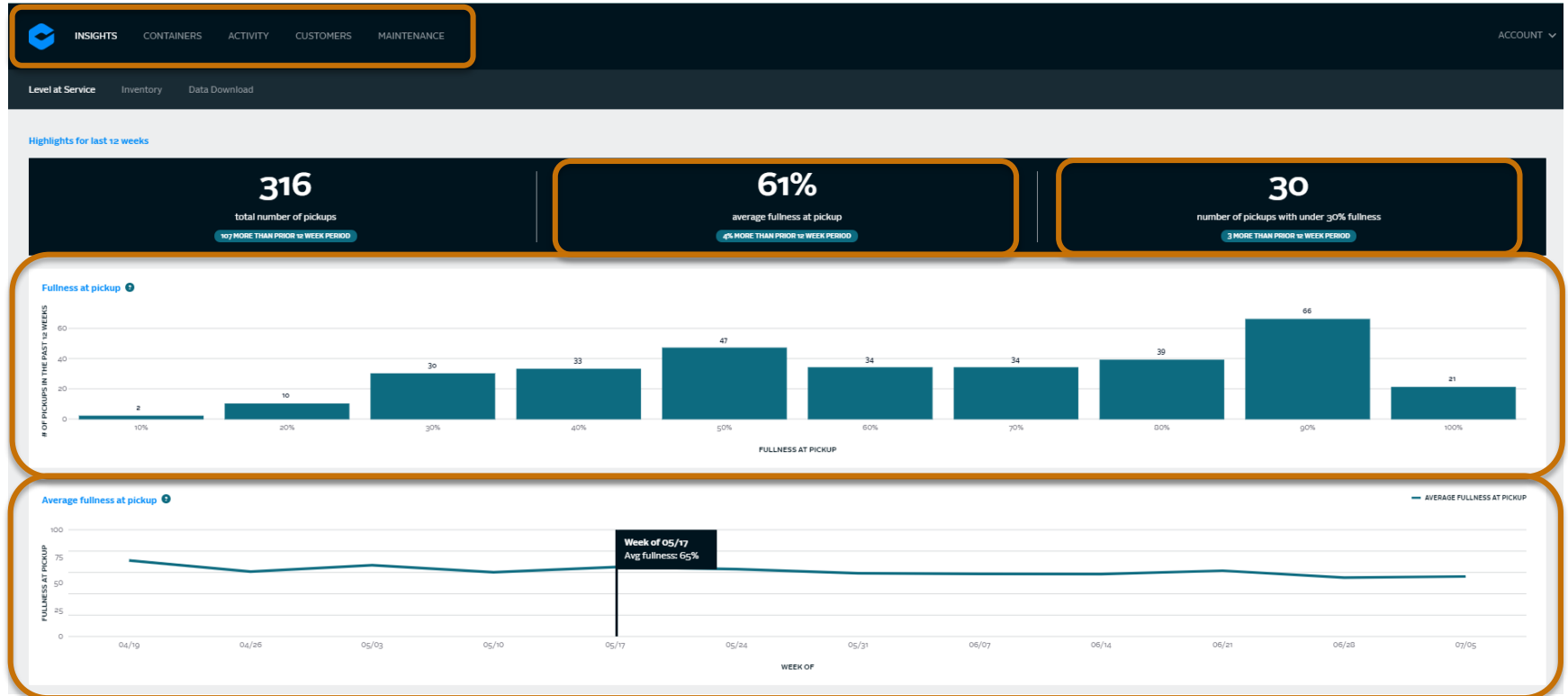


Identifying items in bins

WHAT WERE WE EVALUATING?

- Can AI camera-based bin sensors provide users with useful information to improve their collection programs and identify materials banned from disposal?
- To answer this question, Dillon staff completed two types of analysis:
 - Analysis and Review of Bin Sensors
 - Visual Audits of Dumpsters

INSIGHTS PAGE




CONTAINER PAGE

[Link](#) FRANCISCO LANE # 40547 | 4YD³ | REFUSE | M TH

WEDNESDAY, JUL 14TH AT 3:16 PM

JUMP TO CURRENT IMAGE >



85% 5 | 1.5 Mon, Jul 5

CURRENT CUSTOMER LOCATION
[Francisco Lane](#)
6700 Rumble Street, Burnaby

LOCATION CONTACT

CONTAMINATION IN CURRENT FILL CYCLE

1 UNCOLLAPSED CARDBOARD BOX

2 E-WASTE

3 STYROFOAM

4 BULKY ITEM

5 TANGLEDERS

6 CONSTRUCTION & YARD DEBRIS

ACTIVITY PAGE

[INSIGHTS](#)[CONTAINERS](#)[ACTIVITY](#)[CUSTOMERS](#)[MAINTENANCE](#)[ACCOUNT](#) 

Date - Most to least recent

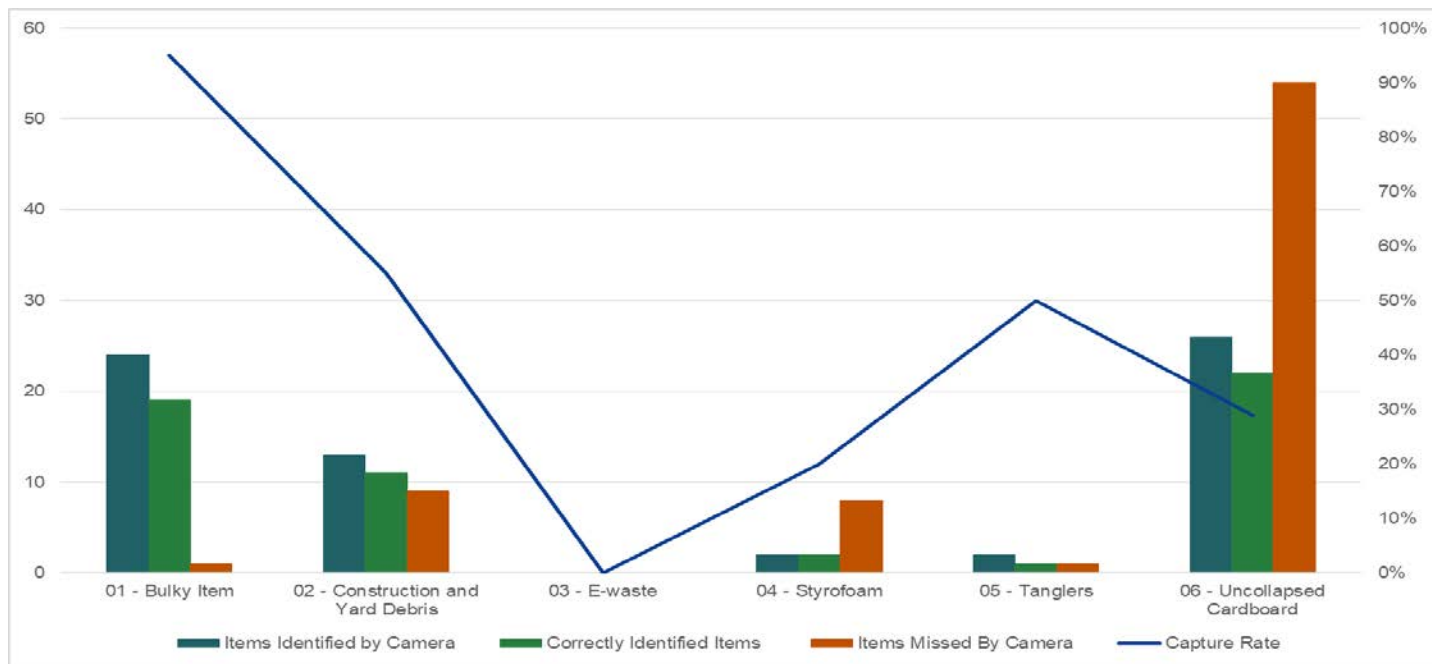
DATE	CUSTOMER	SERVICE LOCATION	CONTAINER	ACTIVITY	FULLNESS	IMAGE
THURSDAY JUL 15, 2021 AT 12:49 PM	Coho Management Services Society	Hairston Hills Co-op 9029 Hairston Court, Burnaby, British Columbia	Hairston Hills Co-op # 41... 4yd ³ Refuse M Th	Emptied at 30% 0 0 0 0	5%	
THURSDAY JUL 15, 2021 AT 10:02 AM	First Service Residential BC	Stonebrook 3288 Noel Drive, Burnaby, British Columbia	The Stonebroke #411097 4yd ³ Refuse M Th	Emptied at 55% 0 0 0 0	15%	
THURSDAY JUL 15, 2021 AT 9:45 AM	Cana Management Associates Limited	Hillside Place Co-op 8400 Forest Grove Drive, Burnaby, British Columbia	Hillside Place Co-op # 4... 4yd ³ Refuse M Th	Emptied at 15% 0 0 0 0	0%	
THURSDAY JUL 15, 2021 AT 9:15 AM	Blue Sky Invest Corp	Starlight Apartments 6555 Telford Avenue, Burnaby, British Columbia	Starlight Apartments # ... 4yd ³ Refuse M Th	Emptied at 75% 0 0 0 0	0%	
THURSDAY JUL 15, 2021 AT 8:17 AM	City of Burnaby	Burnaby Lake Clubhouse 3760 Sperling Avenue, Burnaby, British Columbia	Burnaby Lake Clubhous... 6yd ³ Refuse M Th	Emptied at 85% 1 0.2 0 0	0%	
THURSDAY JUL 15, 2021 AT 6:06 AM	Ascent Real Estate Management Corp	Brentwood Garden 5560 Broadway, Burnaby, British Columbia	Brentwood Gardens #4... 4yd ³ Refuse M Th	Emptied at 90% 2 0.6 0 0	5%	
THURSDAY JUL 15, 2021 AT 7:10 AM	Cana Management Associates Limited	Oakland Housing Co-op 5955 Oakdale Road, Burnaby, British Columbia	Oakland Housing Co-op ... 3yd ³ Refuse M Th	Emptied at 55% 1 0.6 0 0	0%	
THURSDAY JUL 15, 2021 AT 4:10 AM	Strataco Management Ltd.	Francisco Lane 6700 Rumble Street, Burnaby, British Columbia	Francisco Lane # 40547 4yd ³ Refuse M Th	5 1.5	85%	

VISUAL AUDITS

- The auditor assessed the containers in-person according to Metro Vancouver's materials banned from disposal.



RESULTS



RESULTS

- Overall success rate of **43%** at identifying banned items
- **88%** correlation with human auditor on fullness levels



CONCLUSION

- AI requires more training but visuals inside bins are helpful
- Fullness monitoring is accurate and useful
- Incentives required for resident buy in
- Installation damages bins
- Risk of theft





Metro Vancouver skyline

Thank you!



metrovancouver
Together we make our region strong