

Starting Up Soon...



Welcome Back



This Afternoon's Agenda

- Keeping the Business Going During Transition
- *Afternoon Break*
- Cost Models: Who's Used Them & Do They Work?
- *Summary & Concluding Remarks*

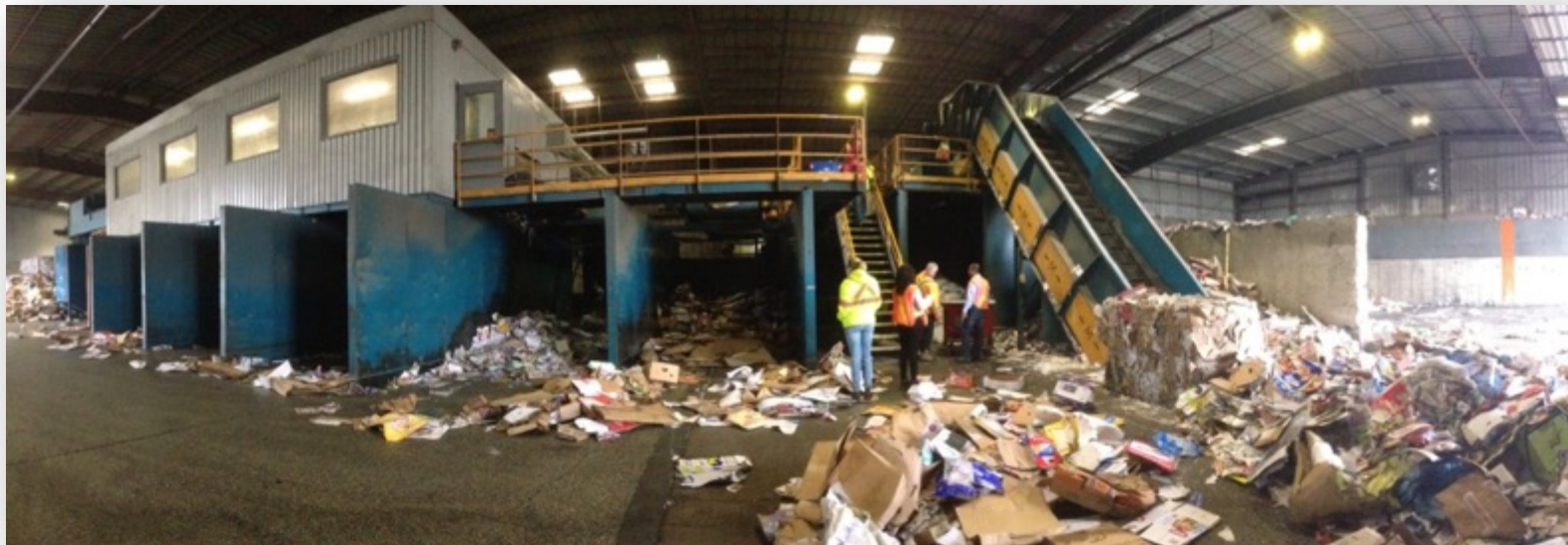


Keeping the Business Going During Transition

Carrie Nash, CIF

How Do We Prepare?

- There's work to be done at the curb & in our MRFs, we need:
 - Smart approaches to manage difficult materials
 - To optimize overall MRF performance
 - To know stop counts
 - To share lessons learned from our municipal colleagues



Panelists

- Carrie Nash, CIF
 - Continuous Improvement in Action: CIF Training Updates & New Opportunities
- Catherine McCausland, City of Guelph
 - New Glass Clean Up System Hits the Mark
- Jen Addison, City of Hamilton
 - Maximizing Revenues at the MRF
- Jamie Delaney, Muskoka
 - GIS Collection Point & Service Level Mapping
- Carrie Nash, CIF
 - Trends from 5 MRF Mass Balance Studies: how the findings can help you

Continuous Improvement in Action: CIF Training Updates & New Opportunities

Carrie Nash
CIF Project Manager

Communications 2.0



- Delivered yesterday
- 20 participants
- Developing messaging that supports & encourages behaviour change through:
 - Use of stories
 - Connecting with 'identity' of your target audience
- Second delivery to be made available upon demand

Strategic RFPs for Recycling

- Delivered yesterday
- 20 participants
- Fundamentals of RFP/tender drafting in plain language to help you understand the “why” behind the clause
 - Force Majeure
 - Change of Laws



Upcoming Online Fundamentals

9-module course covering:

- Introduction to Blue Box Program
- Planning, CSA & FSA
- Markets
- Processing
- Collections
- P&E
- Policies
- Measuring & Monitoring
- Presenting a Plan


CONTINUOUS
IMPROVEMENT FUND

2/52 

Course Overview

- Module 1: Introduction to Recycling and the Blue Box Program
- Module 2: Current and Future State of Affairs of Recycling Program Planning
- Module 3: Markets
- Module 4: Processing
- Module 5: Collection
- Module 6: Promotion and Education (P&E)
- Module 7: Policies
- Module 8: Measure and Monitor
- Module 9: Completing Your Program Plan



Online Fundamentals

CIF
CONTINUOUS
IMPROVEMENT FUND

2/92

Collection Decisions


Understanding all elements of collections will help:

- Manage day to day activity ensuring the agreed upon service delivery standards are met
- Create collection plans that meet the needs and demands of your municipality

Contracting Considerations:

- Your municipality may already have a contract in place, restricting your ability to make any significant changes to your collection system for a while, however
- Paying close attention to the key aspects of collection, will allow you to maximize performance of the existing contract

There is no one type of collection that meets all service needs.



- Completely online, & can be accessed from your smart phone or tablet
- Fully narrated, 21 hours in total
- Requires learners to complete quizzes & case study exercises
- A 2-hour, 100 question exam is required for completion

Watch for a CIF bulletin next week to enroll for May 29 start date!

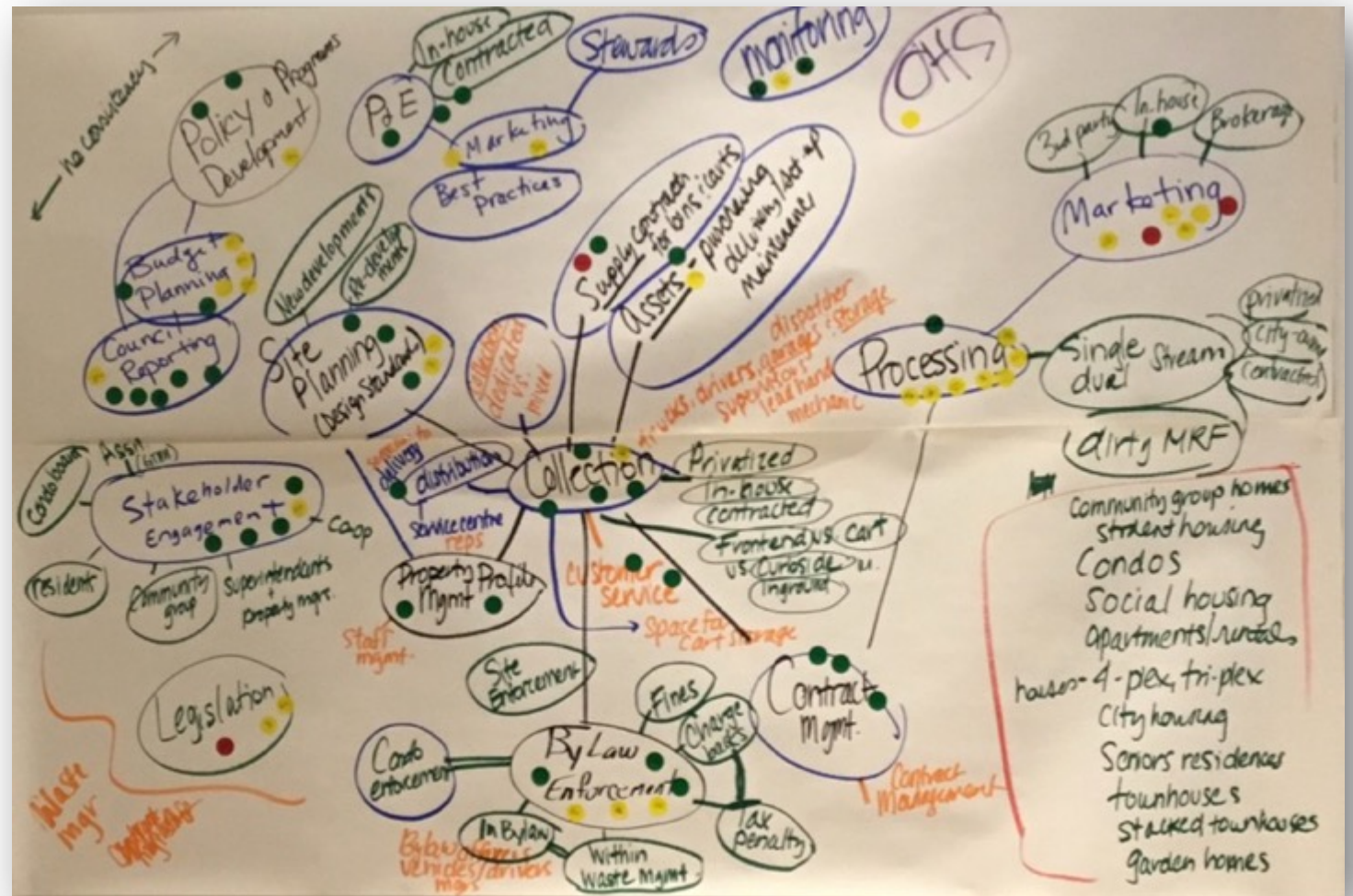
CIF Working Groups

- Collections
 - Cost model initiated
- Depots
 - Cost model, web resources
- MRF
 - Cost model, better practice development



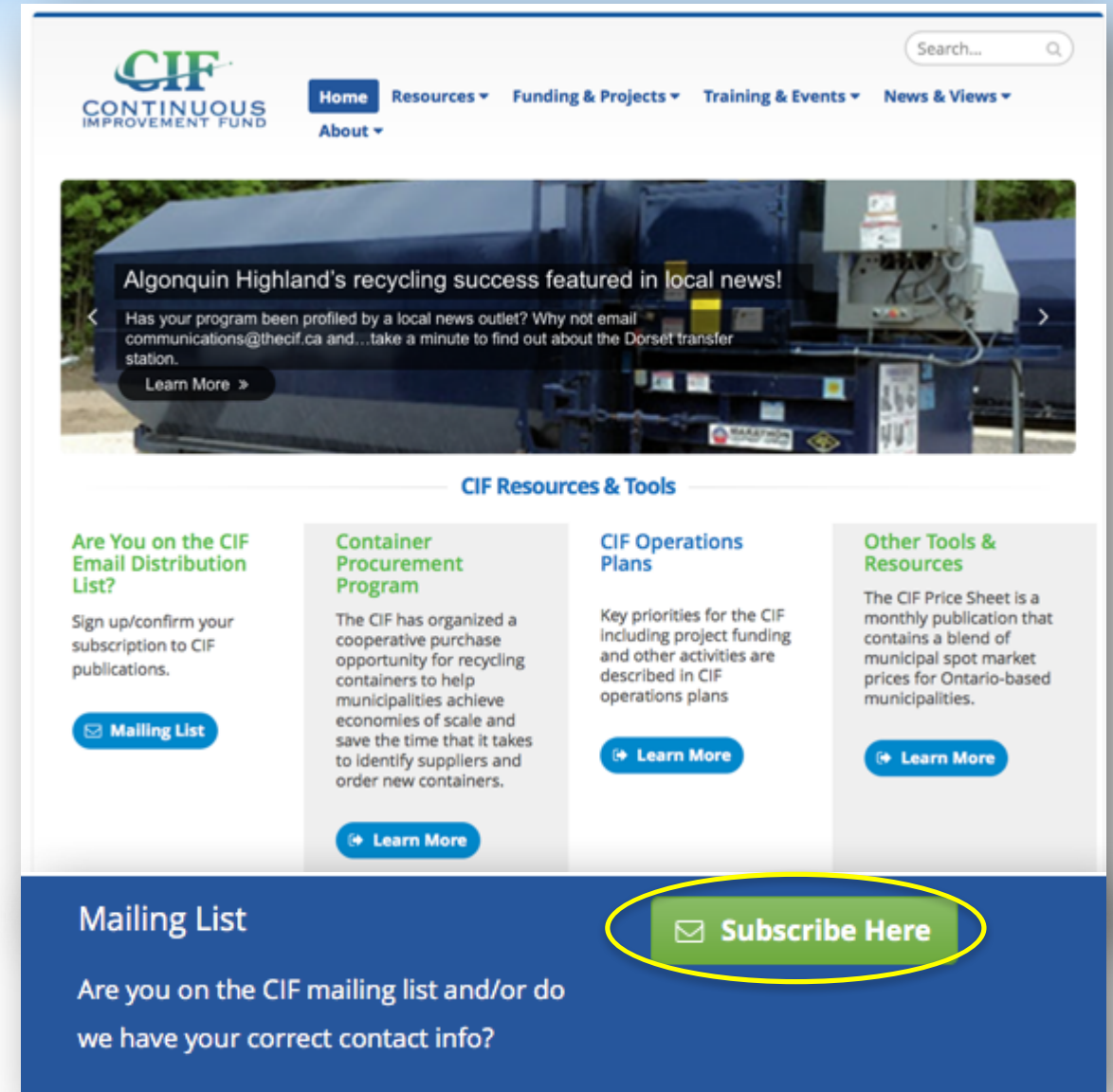
Multi-Residential Program Working Group

- Meets monthly
- Addressing:
 - P&E, common challenges & solutions, benchmarking KPIs
- Developing recommendations report for transition under WFOA



Get Involved!

- Mike Birett
 - Collections
- Gary Everett
 - Depot & website updates
- Carrie Nash
 - MRes, MRF & Training
- Bradley Cutler
 - Waste audits





Glass Sorter CIF Project # 876

Catherine McCausland
Corporation of the City of Guelph

Project Highlights

- Project goal: Remove contaminants from our mixed broken glass stream
- Impacts: We were able to consistently remove over 15% of the contaminants in our glass & market this material
- More information:
 - catherine.mccausland@guelph.ca
 - www.guelph.ca

Overview (1)

■ PURPOSE

- Purchase a system that could remove contaminants from the mixed broken glass stream produced in a single stream MRF

■ CHALLENGES

- How do you remove shredded paper & smaller contaminants from mixed broken glass
- How do you do this consistently during changing Canadian climatic conditions

Overview (2)

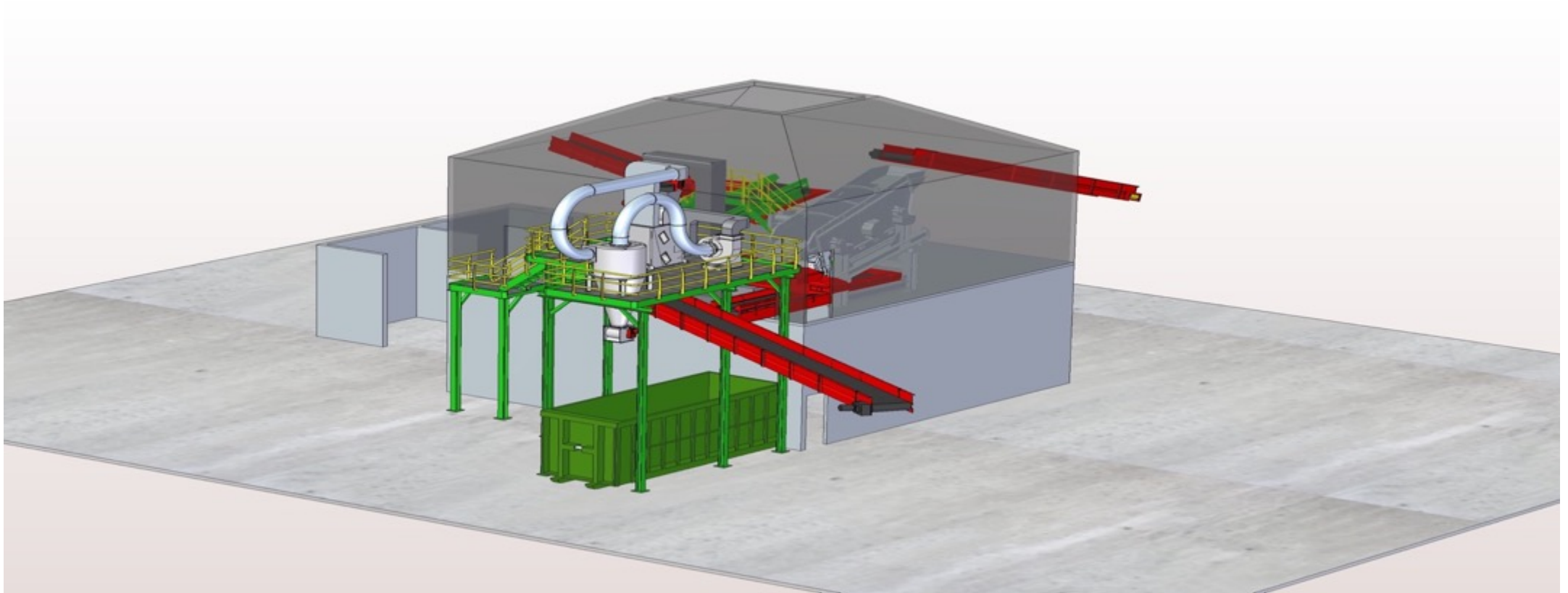
■ STRATEGY

- Test the equipment while running our exact material mix
- Verify that the test would produce accurate results
- Duplicate some of the harshest conditions that this equipment would be operating under

■ EXPECTING THE UNEXPECTED

- Vibrations while screen was operating
- Structural issues

■ PROCESS

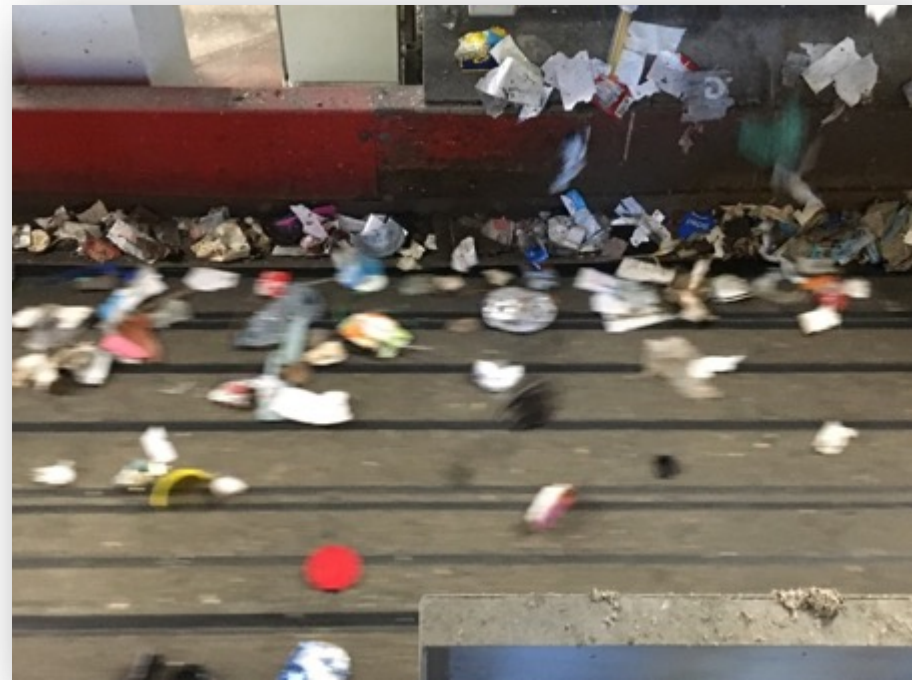


Separation

- Spalek Screen



- Large Fraction (12%)



Small Fraction & Fines Combine for 26% of the Incoming Materials (residue)

- Small Fraction



- Fines



Pre and Post Installation Audits

Summary of Pre Project Audits Conducted by Nexcycle

DATE	%NGR
5-Jan-16	20%
7-Jan-16	19%
14-Jan-16	22%
3-Mar-16	16%
4-Mar-16	21%
17-Mar-16	23%
24-Mar-16	27%
7-Apr-16	29%
14-Apr-16	22%
21-Apr-16	22%

Summary of Post Project Audits Conducted by Nexcycle (Winter)

DATE	%NGR
23-Jan-17	7%
24-Jan-17	7%
25-Jan-17	7%
26-Jan-17	5%
27-Jan-17	9%

Summary of Post Project Audits Conducted by Nexcycle (Fall)

DATE	%NGR
18-Oct-16	4%
18-Oct-16	6%
19-Oct-16	4%
20-Oct-16	4%
21-Oct-16	4%

Summary of Post Project Audits Conducted by Nexcycle (Spring)

11-Apr-17	4%
12-Apr-17	6%
13-Apr-17	5%
19-Apr-17	7%
20-Apr-17	6%
21-Apr-17	7%

Financials

Project Costs	
Process Equipment	\$ 650,000.00
Domestically Sourced Materials, In House Labour and Additional Structural	\$ 130,000.00
Engineering Services and Permitting	\$ 20,000.00
	\$ 800,000.00

Project Summary of Annual Costs, Savings & Diversion for the Glass Cleanup System	Annual	Total	Total
	Tonnage	Expense	Revenue
Total Incoming contaminated glass stream 2016	3900	\$ 223,665.00	
Residue from incoming glass	1180	\$ 67,673.00	
Remaining other recyclables in the glass	240		
Net glass tonnage directed to Market	2480	\$ 27,280.00	
Savings in landfill cost			\$ 128,712.00
Gain from aluminum removed from glass	100		\$ 166,600.00
Annual revenue gain from new glass system			\$ 295,312.00

Payback	2.71 Years
---------	-------------------

In Summary

■ LESSONS LEARNED

- Equipment exceeded our expectations
- Stand alone system vs integrated into the process

■ NEXT STEPS

- Continue to audit materials being processed to gain more consistent information
- Partner with other Municipalities to assist them in cleaning up this problematic material so it can be marketed



Maximizing Revenues at the City of Hamilton

CIF Project #849

Jen Addison
City of Hamilton

Overview

- Background:
 - mass balance audit, implementation of recommendations, measurement & monitoring
- Impacts
 - increased capture, decreased residue, improved film management
- For more information:
 - Jen Addison, MRF Project Manager
 - Jennifer.Addison@hamilton.ca



Residue Recovery Line

Container Line Upgrades

Audit Findings (816.2)	Improvements Implemented (849)
Misconfigured film grabber	Repaired
Overburdened optical sorter	Installed second optical
Loss of high value commodities to residue	Installed residue recovery line
Film plastic impeding material flow	Repurposed Titech optical to capture film

Design Challenges



- Limited space
- PET transport to baler
- Budget escalation
- Changes to the Canadian Dollar

Material Challenges

- 2D materials
- Film Plastic
- Undetectable / Un-capturable Material
- Moisture



Container Line Upgrade Evaluation



Machinex PET Optical Sorter - MACH Hyspec

- Post-installation mass balance audit
- Comparison of pre and post – installation audit findings
- On going, 12 month, internal measuring & monitoring effort

Pre & Post Capture Rates

Material Recovery Rates 2014 VS 2017

Targeted Material	Pre- Recovery Rate (%)	Post- Recovery Rate (%)	Absolute Difference
PET	73.1%	87.2%	14.1%
Aluminum UBC	84.3%	88.2%	3.9%
HDPE	81.2%	77.4%	-3.8%
Polycoat (cartons)	73.6%	66.0%	-7.6%
Film	55.1%	78.5%	23.4%

Residue Recovery Line

Targeted Material	Material Available for Capture (%)	Material Recovered (%)
PET	6%	3%
Aluminum UBC	9%	6%
Polycoat (cartons)	44%	27%
HDPE	11%	6%

Landfill Residue Reduction

12 month internal study

- Compares MT residue sent to landfill 2016 VS 2017
- Recovery of “missed commodities”
- Increase capture of film = reduction in film sent to landfill
- Cost savings

Material	Q1 2016 Landfill (MT)	Q1 2017 Landfill (MT)	Difference (MT)	Difference (%)
Residue	1,592	1,326	267	-17

Project Costs

Upgrade/Improvement	Cost
Capital Investment	\$1,752,000
Measuring & Monitoring Program	\$18,000
CIF Contribution	-\$705,000
TOTAL NET COST (approximate)	\$1,065,000

Next Steps

- Post installation audit results
 - 5.5% overall capture increase
 - >\$160,000 revenue increase
 - Decrease in landfilling fees
- Further tweaks to the system need to be considered:
 - 2017 Optimization Audit



Why Auditing Pays Off

- Determine material capture rates
- Measure & monitor equipment performance
- Quantify “missed” recyclables
- Identify opportunities to increase revenue
- Identify opportunities for Continuous Improvement

“A Healthy Line is a Wealthy Line”





GIS Collection Point & Service Level Mapping System CIF #820

Jamie Delaney
District Municipality of Muskoka

Project Highlights

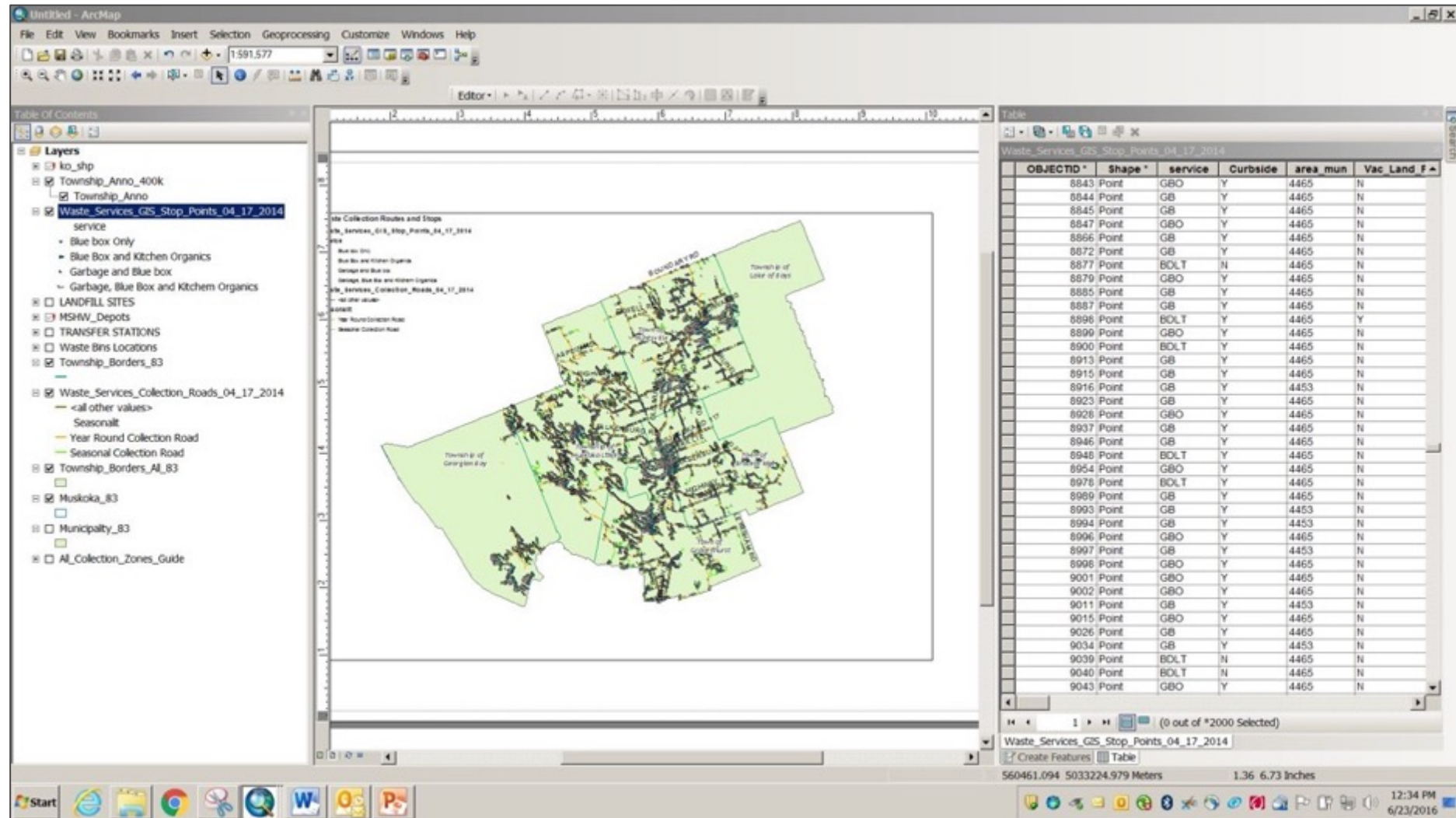
- Project goal:
 - To improve the effectiveness & efficiency of Muskoka's collection system through enhanced data management
- More information:
 - jdelaney@muskoka.on.ca
 - muskoka.on.ca

District of Municipality of Muskoka

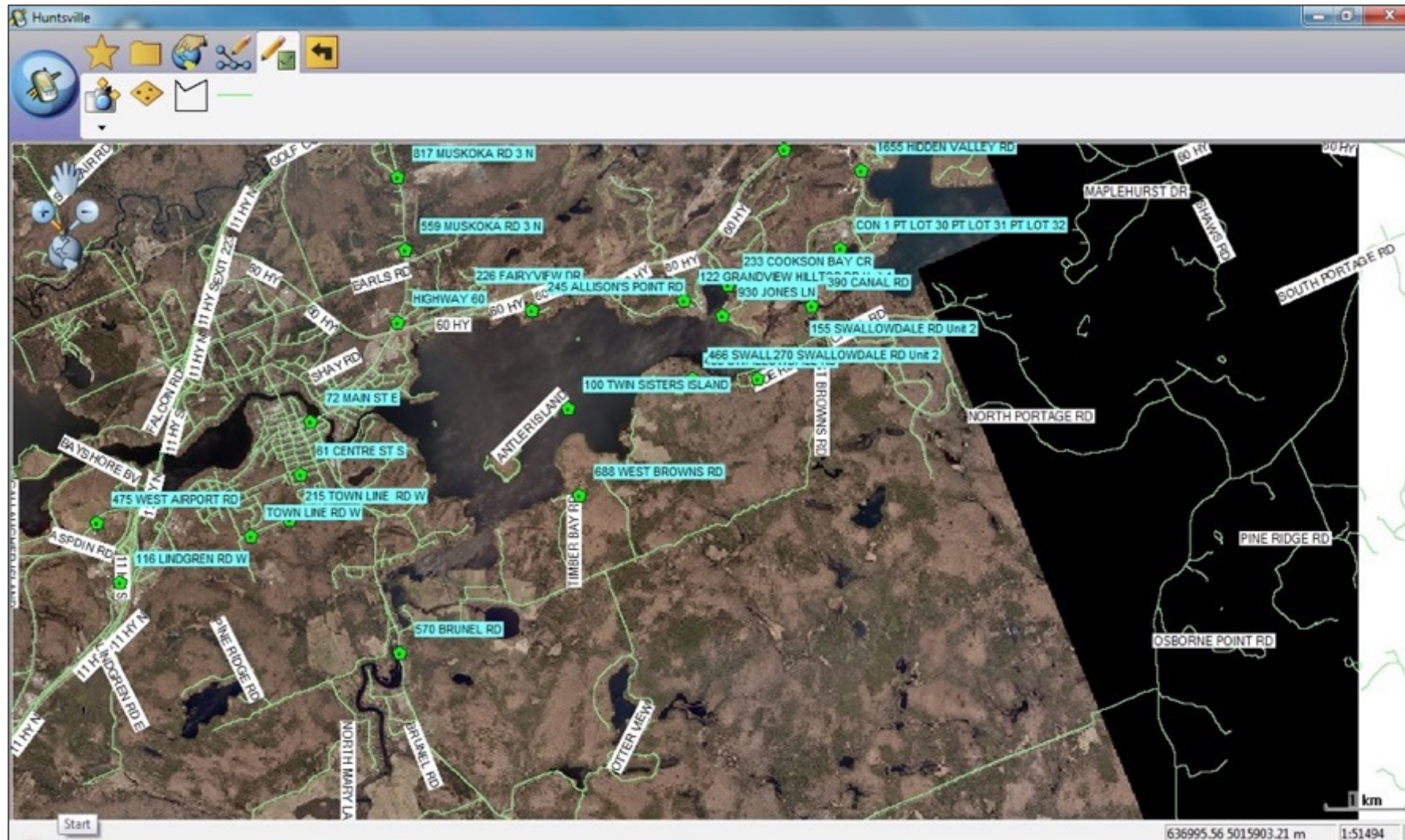


Do You Know Where The Waste Is?

Desktop GIS ArcMap (ESRI)



Field GIS ArcPad (ESRI)



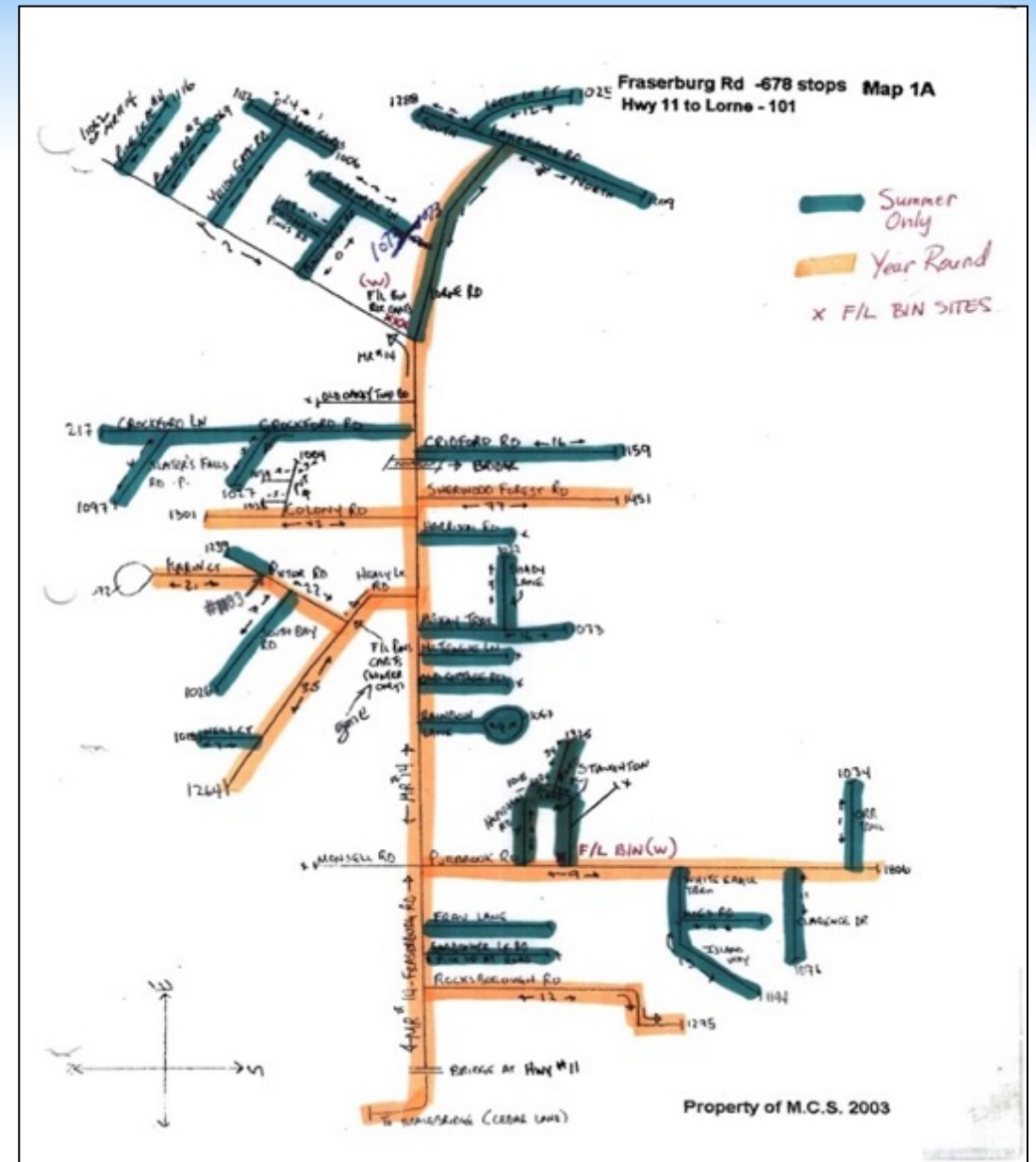
The Road Map to Success

- Hard copy maps & collection street lists
- Using existing GIS databases (Road network, MPAC, & 911) create representation of Curbside Collections & stop locations & type (residential vs. ICI)
- Using field & workstation GIS editing, locate the stops along the routes spatially



Improvement

- Cost & time to update maps by hand
- Hand drawn route maps



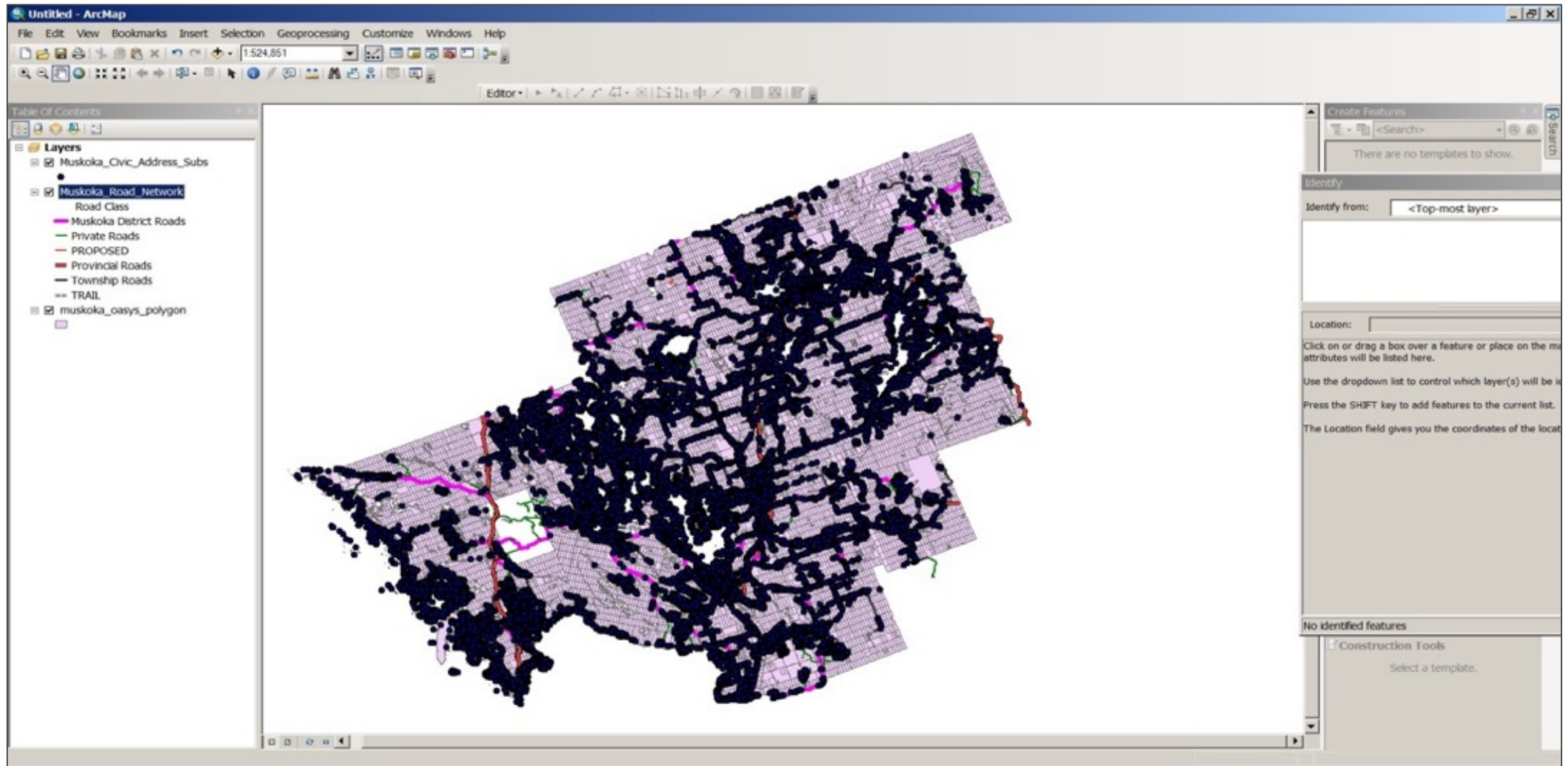
Updates

- Revising existing documents to include new information



STREET NAME:	Township:	Map #
1st St	GH	5I
3rd St	GH	5I
4th St	GH	5I
5th St	GH	5I
6th St	GH	5I
Abbey Lane	GH	1L
Aberdeen St	ML	3Q
Action Island Rd	ML	3K
Ahmic Ave	ML	3S
Alana Blvd	GH	1I
Albert Foley Rd	ML	3F
Alexander St	GH	5JL
Alexandra St	BB	5E
Alice Ave	BB	2A
Alice St	BB	5C
Allenerville Rd	HV	2H
Alpine Ranch Rd	HV	4D
Alport Bay Rd	BB	5G
Alvin Vies Lane	HV	4F ← ML 2E
Amelia Cr	GH	1J
Anderson Rd	BB	1B
Andrea Dr	BB	5D
Andy's Lane	GB	3T
Anglo St	BB	5E
Ann St	ML	3E
Ann St	BB	5A
Apinary Way	ML	3K
Armstrong Dr	BB	1H
Armstrong Point Rd	ML	2F
Armstrong St	BB	5D
Arrowhead Park Rd	HV	4I
Art Crisp Rd	GH	1I
Arthur Schultz Rd	GH	1I
Arundel Lodge Rd	ML	3E
Ascott Lane	HV	4D
Ashforth Dr.	ML	3F
Ashley Lane	BB	1B
Ashworth Rd	HV	2L
Aspin Rd	HV	2H
Aspin Rd	ML	2L
Askins Lake	HV	4D
Aubrey St	BB	5B
Austin St	GH	1L
Avon Lane	ML	3Q
Bagely Rd Pnt	GH	1I
Bailey Lane	BB	5G
Bailey Rd	GB	3U
Bailey St	ML	2F
Bakery Lane	GH	3A
Bala Falls Rd	ML	3Q
Balfour Woods Rd	GH	1H
Balls Dr	BB	5A
Balsam Chutes	HV	4D
Bangor Lodge Rd	BB	5F
Bannockburn Rd	ML	3K
Barrickman Rd	ML	3E
Barnes Rd	GH	5M
Bass Line Rd	GH	1I
Bass Bay Rd	GB	3T
Bass Lake Rd	ML	3N
Baxter Loop	GB	3T
Bay Meadows Rd	HV	4K
Bay St	GH	1L
Bayview Ave	ML	2J
Beach Rd	HV	2H

Baseline Databases



Baseline Databases

Table

Muskoka_Oasys

Location	StreetNumber	UpperNumber	Qualifier	StreetName	UnitNumber	PropCode	PropertyNum *	Prime_Sub	Access	Subs	Strs	UnitCI	
BETHUNE DR N	0	<Null>	<Null>	BETHUNE DR N	<Null>	100	440201000100100	0000	Y	0	0	VL	RANGE EMR PT
RANGE EMR PT LOT 5 RP 35R7059 PARTS 8 & 9	0	<Null>	<Null>	RANGE EMR PT LOT 5 RP 35R7059	<Null>	100	440201000100101	0000	Y	0	0	VL	RANGE EMR PT
RANGE EMR PT LOT 5 RP 35R7059 PARTS 12 & 15	0	<Null>	<Null>	RANGE EMR PT LOT 5 RP 35R7059	<Null>	100	440201000100102	0000	Y	0	0	VL	RANGE EMR PT
1091 FIRST ST S	1091	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100200	0000	Y	0	2	RU	RANGE EMR PT
1097 BETHUNE DR S	1097	<Null>	<Null>	BETHUNE DR S	<Null>	626	440201000100201	0000	<Null>	2	0	<Null>	RANGE EMR PT
1097 BETHUNE DR S	1097	<Null>	<Null>	BETHUNE DR S	<Null>	626	440201000100201	0001	<Null>	0	0	OT	RANGE EMR PT
1081 FIRST ST S	1081	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100300	0000	Y	2	2	<Null>	RANGE EMR PT
1081 FIRST ST S	1081	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100300	0001	<Null>	0	0	RU	RANGE EMR PT
1061 FIRST ST S	1061	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100400	0000	Y	0	1	RU	RANGE EMR PT
1051 FIRST ST S	1051	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100500	0000	Y	2	1	<Null>	RANGE EMR PT
1051 FIRST ST S	1051	<Null>	<Null>	FIRST ST S	<Null>	301	440201000100500	0001	<Null>	0	0	RU	RANGE EMR PT
150 TALISMAN DR	150	<Null>	<Null>	TALISMAN DR	<Null>	414	440201000100600	0000	Y	2	0	<Null>	RANGE EMR PT
150 TALISMAN DR	150	<Null>	<Null>	TALISMAN DR	<Null>	414	440201000100600	0001	<Null>	0	0	COM	RANGE EMR LC
200 TALISMAN DR	200	<Null>	<Null>	TALISMAN DR	<Null>	421	440201000100601	0000	<Null>	0	0	COM	RANGE EMR PT
1170-1200 MUSKOKA RD S	1170	1200	<Null>	MUSKOKA RD S	<Null>	430	440201000101000	0000	Y	7	0	<Null>	RANGE EMR LC
1170 MUSKOKA RD S	1170	<Null>	<Null>	MUSKOKA RD S	<Null>	430	440201000101000	0001	<Null>	0	0	COM	RANGE EMR LC
1190 MUSKOKA RD S	1190	<Null>	<Null>	MUSKOKA RD S	<Null>	430	440201000101000	0002	<Null>	0	0	COM	RANGE EMR LC
1200 MUSKOKA RD S	1200	<Null>	<Null>	MUSKOKA RD S	<Null>	430	440201000101000	0003	<Null>	0	0	COM	RANGE EMR LC
1105 BETHUNE DR S	1105	<Null>	<Null>	BETHUNE DR S	<Null>	414	440201000101001	0000	Y	2	0	<Null>	RANGE EMR LC
1105 BETHUNE DR S	1105	<Null>	<Null>	BETHUNE DR S	<Null>	414	440201000101001	0001	<Null>	0	0	COM	<Null>
1100 MUSKOKA RD S	1100	<Null>	<Null>	MUSKOKA RD S	<Null>	400	440201000101020	0000	Y	0	0	COM	RANGE EMR PT
1300 MUSKOKA RD S	1300	<Null>	<Null>	MUSKOKA RD S	<Null>	103	440201000101100	0000	Y	0	0	VL	RANGE EMR PT
1255 GEORGE BEARD LANE	1255	<Null>	<Null>	GEORGE BEARD LANE	<Null>	520	440201000101300	0000	Y	4	0	<Null>	RANGE WMR PT
1255 GEORGE BEARD LANE 1	1255	<Null>	<Null>	GEORGE BEARD LANE	1	520	440201000101300	0001	<Null>	0	0	IND	<Null>
1255 GEORGE BEARD LANE 2	1255	<Null>	<Null>	GEORGE BEARD LANE	2	520	440201000101300	0002	<Null>	0	0	COM	<Null>
270 MARGARET ST	270	<Null>	<Null>	MARGARET ST	<Null>	520	440201000101301	0000	Y	2	0	<Null>	PLAN 7 LOTS 11
270 MARGARET ST	270	<Null>	<Null>	MARGARET ST	<Null>	520	440201000101301	0001	<Null>	0	0	COM	PLAN 7 LOTS 11
431 TALISMAN DR	431	<Null>	<Null>	TALISMAN DR	<Null>	427	440201000101400	0000	Y	12	0	<Null>	RANGE WMR P
431 TALISMAN DR	431	<Null>	<Null>	TALISMAN DR	<Null>	427	440201000101400	0001	<Null>	0	0	COM	RANGE WMR P
TALISMAN DR & EDWARD ST	0	<Null>	<Null>	TALISMAN DR & EDWARD ST	<Null>	427	440201000101400	0002	<Null>	0	0	ECL	RANGE WMR P
351 TALISMAN DR UNIT 7	351	<Null>	<Null>	TALISMAN DR	7	427	440201000101400	0003	<Null>	0	0	COM	RANGE WMR P
351 TALISMAN DR UNIT 6	351	<Null>	<Null>	TALISMAN DR	6	427	440201000101400	0004	<Null>	0	0	COM	RANGE WMR P
351 TALISMAN DR UNIT 5	351	<Null>	<Null>	TALISMAN DR	5	427	440201000101400	0005	<Null>	0	0	COM	RANGE WMR P
351 TALISMAN DR UNIT 3	351	<Null>	<Null>	TALISMAN DR	3	427	440201000101400	0006	<Null>	0	0	COM	RANGE WMR P
351 TALISMAN DR UNIT 2	351	<Null>	<Null>	TALISMAN DR	2	427	440201000101400	0007	<Null>	0	0	COM	RANGE WMR P
351 TALISMAN DR UNIT 1	351	<Null>	<Null>	TALISMAN DR	1	427	440201000101400	0008	<Null>	0	0	COM	RANGE WMR P
RANGE WMR PT LOT 5 RP 35R18636 PART 1	0	<Null>	<Null>	RANGE WMR PT LOT 5 RP 35R18636	<Null>	100	440201000101401	0000	Y	0	0	VL	RANGE WMR P
291 TALISMAN DR	291	<Null>	<Null>	TALISMAN DR	<Null>	558	440201000101500	0000	Y	2	0	<Null>	PLAN 7 PT LOT

(0 out of 80603 Selected)

Muskoka_Oasys | Muskoka_Civic_Address_Sub | Muskoka_Road_Network

Table Of Contents | Table

MPAC Dataset

Baseline Databases

Untitled - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:1,032,071

Editor

Table

Muskoka_Civic_Address_Sub

FID	Shape	PropertyNu	Property_1	StreetNumb	StreetQual	StreetName	StreetUnit	StreetAlia	Location	Municipali	Longitude	Latitude	X_UTM83	Y_UTM83
0	Point	441801000100800	4418010001008000000	3		WELLINGTON ST			3 WELLINGTON ST	Town of Bracebridge	-79.315724	45.031981	632673	4987883
1	Point	441801000100800	4418010001008000001	3		WELLINGTON ST			3 WELLINGTON ST	Town of Bracebridge	-79.315724	45.031981	632673	4987883
2	Point	441801000100800	4418010001008000002	3		WELLINGTON ST			3 WELLINGTON ST	Town of Bracebridge	-79.315724	45.031981	632673	4987883
3	Point	441801000100900	4418010001009000000	7		WELLINGTON ST			7 WELLINGTON ST	Town of Bracebridge	-79.315723	45.032173	632672	4987904
4	Point	441801000101000	4418010001010000000	11		WELLINGTON ST			11 WELLINGTON ST	Town of Bracebridge	-79.315553	45.032383	632687	4987928
5	Point	441801000101000	4418010001010000001	11		WELLINGTON ST			11 WELLINGTON ST	Town of Bracebridge	-79.315553	45.032383	632687	4987928
6	Point	441801000101000	4418010001010000002	11		WELLINGTON ST			11 WELLINGTON ST	Town of Bracebridge	-79.315553	45.032383	632687	4987928
7	Point	441801000101100	4418010001011000000	15		WELLINGTON ST			15 WELLINGTON ST	Town of Bracebridge	-79.31584	45.032467	632663	4987937
8	Point	441801000101100	4418010001011000010	15		WELLINGTON ST			15 WELLINGTON ST	Town of Bracebridge	-79.31584	45.032467	632663	4987937
9	Point	441801000101100	4418010001011000020	15		WELLINGTON ST	BSMT		15 WELLINGTON ST Unit BSMT	Town of Bracebridge	-79.31584	45.032467	632663	4987937
10	Point	441801000101200	4418010001012000000	19		WELLINGTON ST			19 WELLINGTON ST	Town of Bracebridge	-79.315903	45.032597	632657	4987951
11	Point	441801000101300	4418010001013000000	25		WELLINGTON ST			25 WELLINGTON ST	Town of Bracebridge	-79.316132	45.032746	632639	4987967
12	Point	441801000101400	4418010001014000000	9		SMITH ST			9 SMITH ST	Town of Bracebridge	-79.315952	45.032796	632653	4987973
13	Point	441801000101500	4418010001015000000	17		SMITH ST			17 SMITH ST	Town of Bracebridge	-79.315759	45.03285	632668	4987979
14	Point	441801000101600	4418010001016000000	21		SMITH ST			21 SMITH ST	Town of Bracebridge	-79.31557	45.032982	632683	4987986
15	Point	441801000101700	4418010001017000000	29		WELLINGTON ST			29 WELLINGTON ST	Town of Bracebridge	-79.316271	45.03315	632627	4988012
16	Point	441801000101800	4418010001018000000	33		WELLINGTON ST			33 WELLINGTON ST	Town of Bracebridge	-79.316348	45.033294	632621	4988028
17	Point	441801000101800	4418010001018000001	33		WELLINGTON ST			33 WELLINGTON ST	Town of Bracebridge	-79.316348	45.033294	632621	4988028
18	Point	441801000101800	4418010001018000002	33		WELLINGTON ST			33 WELLINGTON ST	Town of Bracebridge	-79.316348	45.033294	632621	4988028
19	Point	441801000101900	4418010001019000002	39		WELLINGTON ST			39 WELLINGTON ST	Town of Bracebridge	-79.316534	45.033444	632606	4988044
20	Point	441801000102000	4418010001020000000	43		WELLINGTON ST			43 WELLINGTON ST	Town of Bracebridge	-79.316571	45.033626	632602	4988064
21	Point	441801000102000	4418010001020000001	43		WELLINGTON ST	1		43 WELLINGTON ST Unit 1	Town of Bracebridge	-79.316658	45.033695	632595	4988072
22	Point	441801000102000	4418010001020000002	43		WELLINGTON ST	2		43 WELLINGTON ST Unit 2	Town of Bracebridge	-79.316539	45.033661	632605	4988068
23	Point	441801000102000	4418010001020000003	43		WELLINGTON ST	3		43 WELLINGTON ST Unit 3	Town of Bracebridge	-79.316467	45.033616	632611	4988063
24	Point	441801000102100	4418010001021000000	47		WELLINGTON ST			47 WELLINGTON ST	Town of Bracebridge	-79.316578	45.033852	632601	4988089
25	Point	441801000102200	4418010001022000000	51		WELLINGTON ST			51 WELLINGTON ST	Town of Bracebridge	-79.316651	45.033985	632595	4988104
26	Point	441801000102300	4418010001023000000	55		WELLINGTON ST			55 WELLINGTON ST	Town of Bracebridge	-79.316748	45.034153	632587	4988123
27	Point	441801000102300	4418010001023000001	55		WELLINGTON ST			55 WELLINGTON ST	Town of Bracebridge	-79.316748	45.034153	632587	4988123
28	Point	441801000102399	4418010001023990000	57		WELLINGTON ST			57 WELLINGTON ST	Town of Bracebridge	-79.316743	45.03432	632587	4988141
29	Point	441801000102400	4418010001024000000	59		WELLINGTON ST			59 WELLINGTON ST	Town of Bracebridge	-79.31678	45.034394	632584	4988149
30	Point	441801000102600	4418010001026000000	67		WELLINGTON ST			67 WELLINGTON ST	Town of Bracebridge	-79.31703	45.034603	632564	4988172
31	Point	441801000102600	4418010001026000001	67		WELLINGTON ST			67 WELLINGTON ST	Town of Bracebridge	-79.31703	45.034603	632564	4988172
32	Point	441801000102700	4418010001027000000	73		WELLINGTON ST			73 WELLINGTON ST	Town of Bracebridge	-79.317015	45.03487	632564	4988202
33	Point	441801000102900	4418010001029000000	202		DILL ST			202 DILL ST	Town of Bracebridge	-79.316871	45.035189	632575	4988237
34	Point	441801000103000	4418010001030000000	200		DILL ST			200 DILL ST	Town of Bracebridge	-79.316674	45.03534	632590	4988255
35	Point	441801000103000	4418010001030000001	200		DILL ST			200 DILL ST	Town of Bracebridge	-79.316674	45.03534	632590	4988255
36	Point	441801000103100	4418010001031000000	77		WELLINGTON ST			77 WELLINGTON ST	Town of Bracebridge	-79.317173	45.035025	632552	4988219
37	Point	441801000103200	4418010001032000000	76		HOLDITCH ST			76 HOLDITCH ST	Town of Bracebridge	-79.316521	45.035292	632603	4988239
38	Point	441801000103300	4418010001033000000	80		HOLDITCH ST			80 HOLDITCH ST	Town of Bracebridge	-79.316457	45.035025	632608	4988220

1 (0 out of 58614 Selected)

Muskoka_Oasys Muskoka_Civic_Address_Sub Muskoka_Road_Network

Table Of Contents Table

911 Point Dataset

Baseline Databases

Untitled - ArcMap

File Edit View Bookmarks Insert Selection Geoprocessing Customize Windows Help

1:1,032,071

Editor

Table

Muskoka_Road_Network

NAME *	SUFFIX	DIRECTION	L LADD	L HADD	R LADD	R HADD	L MUNICIPIA	R MUNICIPIA	ROAD TYPE	LENGTH	ROAD NAME *	ROAD ALIAS	Maintenanc	Oneway
11	HY	N	0	0	1048	1056	GRAVENHURST	GRAVENHURST	PROVINCIAL	100.859497	11 HY N	<Null>	YEAR ROUND	1
11	HY	S	0	0	1057	1055	GRAVENHURST	GRAVENHURST	PROVINCIAL	24.255887	11 HY S	<Null>	YEAR ROUND	1
1630 MUSKOKA RD 38	<Null>	<Null>	0	0	0	0	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	144.875755	1630 MUSKOKA RD 38	RAGGED RAPIDS RD	PRIVATE	<Null>
RAINBOW	CL	<Null>	1021	1075	1020	1070	GRAVENHURST	GRAVENHURST	TOWNSHIP	361.178083	RAINBOW CL	<Null>	<Null>	<Null>
RAINBOW	CL	<Null>	0	0	0	0	GRAVENHURST	GRAVENHURST	TOWNSHIP	10.345446	RAINBOW CL	<Null>	<Null>	<Null>
11	HY	N	0	0	1404	1424	GRAVENHURST	GRAVENHURST	PROVINCIAL	161.88829	11 HY N	<Null>	YEAR ROUND	1
11	HY	S	0	0	1423	1403	GRAVENHURST	GRAVENHURST	PROVINCIAL	205.130144	11 HY S	<Null>	YEAR ROUND	1
11	HY	N	0	0	1736	1756	GRAVENHURST	GRAVENHURST	PROVINCIAL	174.357008	11 HY N	<Null>	YEAR ROUND	1
11	HY	S	0	0	12619	12563	HUNTSVILLE	HUNTSVILLE	PROVINCIAL	633.887434	11 HY S	<Null>	YEAR ROUND	1
11	HY	N	<Null>	<Null>	12722	12802	HUNTSVILLE	HUNTSVILLE	PROVINCIAL	423.56103	11 HY N	<Null>	<Null>	1
592	HY	<Null>	0	0	12744	12800	HUNTSVILLE	HUNTSVILLE	PROVINCIAL	354.897186	592 HY	<Null>	YEAR ROUND	<Null>
GRANITE	DR	<Null>	20	84	21	85	HUNTSVILLE	HUNTSVILLE	PRIVATE	1280.108505	GRANITE DR	<Null>	<Null>	<Null>
MINERAL SPRINGS	RD	<Null>	2	158	1	157	HUNTSVILLE	HUNTSVILLE	TOWNSHIP	645.456106	MINERAL SPRINGS RD	<Null>	<Null>	<Null>
MINERAL SPRINGS	RD	<Null>	160	190	159	109	HUNTSVILLE	HUNTSVILLE	TOWNSHIP	196.279444	MINERAL SPRINGS RD	<Null>	<Null>	<Null>
MBC RIVERSIDE	DR	<Null>	1	5	2	6	HUNTSVILLE	HUNTSVILLE	PRIVATE	129.823607	MBC RIVERSIDE DR	<Null>	<Null>	<Null>
MBC RIVERSIDE	DR	<Null>	7	9	8	10	HUNTSVILLE	HUNTSVILLE	PRIVATE	59.857958	MBC RIVERSIDE DR	<Null>	<Null>	<Null>
MAPLE GROVE	DR	<Null>	1	13	2	14	HUNTSVILLE	HUNTSVILLE	PRIVATE	122.439781	MAPLE GROVE DR	<Null>	<Null>	<Null>
MAPLE GROVE	DR	<Null>	15	59	16	60	HUNTSVILLE	HUNTSVILLE	PRIVATE	345.848734	MAPLE GROVE DR	<Null>	<Null>	<Null>
PROSPECT	DR	<Null>	1	7	2	8	HUNTSVILLE	HUNTSVILLE	PRIVATE	66.316127	PROSPECT DR	<Null>	<Null>	<Null>
PROSPECT	DR	<Null>	9	19	10	20	HUNTSVILLE	HUNTSVILLE	PRIVATE	156.502454	PROSPECT DR	<Null>	<Null>	<Null>
EXIT 189	<Null>	<Null>	0	0	0	0	GEORGIAN BAY	GEORGIAN BAY	PROVINCIAL	279.100611	EXIT 189	<Null>	YEAR ROUND	<Null>
HERMANS	RD	<Null>	1001	1011	1000	1012	LAKE OF BAYS	LAKE OF BAYS	TOWNSHIP	219.571518	HERMANS RD	<Null>	<Null>	<Null>
1032 MORTIMERS POINT	RD	<Null>	1	15	2	14	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	649.711572	1032 MORTIMERS POINT RD	<Null>	PRIVATE	<Null>
1033 HAMIL	RD	<Null>	1	9	2	8	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	89.445228	1033 HAMIL RD	<Null>	PRIVATE	<Null>
1033 ROSSCLAIR	RD	<Null>	0	0	0	0	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	85.428158	1033 ROSSCLAIR RD	<Null>	PRIVATE	<Null>
1033 ROSSCLAIR	RD	<Null>	27	37	28	38	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	436.505039	1033 ROSSCLAIR RD	<Null>	PRIVATE	<Null>
1033 ROSSCLAIR	RD	<Null>	2	10	1	11	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	637.388801	1033 ROSSCLAIR RD	<Null>	PRIVATE	<Null>
FISH HOOK	LN	<Null>	1000	1014	1001	1015	GRAVENHURST	GRAVENHURST	TOWNSHIP	250.062242	FISH HOOK LN	<Null>	<Null>	<Null>
LAKE JOSEPH	RD	<Null>	5903	7191	6902	7192	GEORGIAN BAY	GEORGIAN BAY	PROVINCIAL	1270.905259	LAKE JOSEPH RD	<Null>	YEAR ROUND	<Null>
1030 BROADLEY	RD	<Null>	4	8	5	7	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	34.408129	1030 BROADLEY RD	<Null>	PRIVATE	<Null>
1030 BROADLEY	RD	<Null>	10	30	9	29	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	244.448592	1030 BROADLEY RD	<Null>	PRIVATE	<Null>
ISLAND VIEW	LN	<Null>	2	10	1	9	HUNTSVILLE	HUNTSVILLE	PRIVATE	157.833919	ISLAND VIEW LN	<Null>	<Null>	<Null>
1035 HURLING POINT	RD	<Null>	1	11	2	12	MUSKOKA LAKES	MUSKOKA LAKES	PRIVATE	134.982914	1035 HURLING POINT RD	<Null>	PRIVATE	<Null>
1035 BRANDY CREST	RD	<Null>	0	0	0	0	MUSKOKA LAKES	MUSKOKA LAKES	TOWNSHIP	322.143215	1035 BRANDY CREST RD	<Null>	NON-MAINTAINED	<Null>
MITAWBIK	RD	<Null>	0	0	0	0	MOOSE DEER POINT	MOOSE DEER POINT	PRIVATE	285.927575	MITAWBIK RD	<Null>	<Null>	<Null>
MITAWBIK	RD	<Null>	1011	1049	1010	1050	MOOSE DEER POINT	MOOSE DEER POINT	PRIVATE	123.683696	MITAWBIK RD	<Null>	<Null>	<Null>
MITAWBIK	RD	<Null>	1001	1009	1000	1008	MOOSE DEER POINT	MOOSE DEER POINT	PRIVATE	85.674892	MITAWBIK RD	<Null>	<Null>	<Null>
OLD SCHOOL	RD	<Null>	<Null>	<Null>	<Null>	<Null>	MOOSE DEER POINT	MOOSE DEER POINT	PRIVATE	348.518726	OLD SCHOOL RD	<Null>	<Null>	<Null>
ARROW RIDGE	<Null>	<Null>	1	19	2	20	BRACEBRIDGE	BRACEBRIDGE	PRIVATE	631.283018	ARROW RIDGE	<Null>	<Null>	<Null>

(0 out of 9644 Selected)

Muskoka_Oasys | Muskoka_Civic_Address_Subs | Muskoka_Road_Network

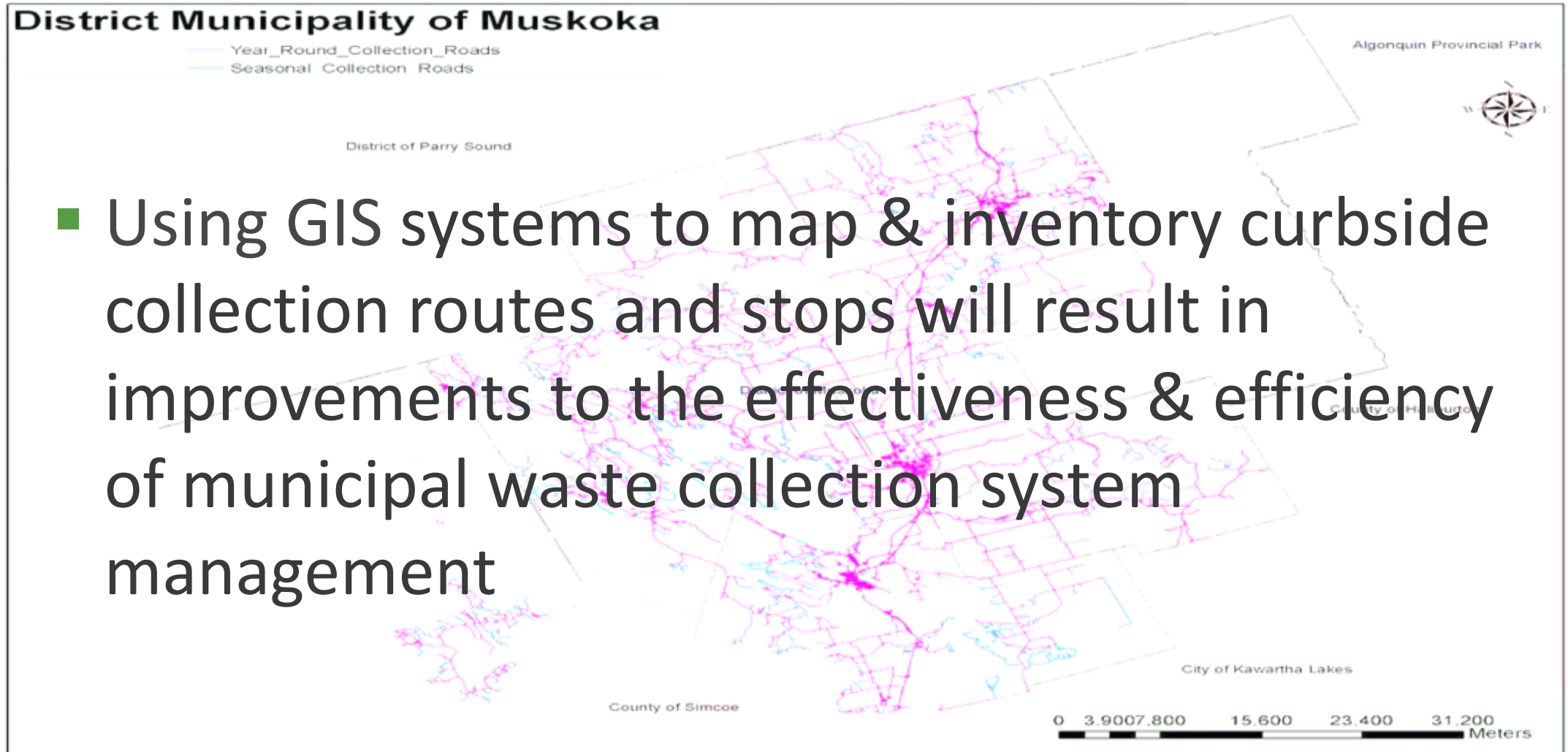
Table Of Contents | Table

Road Centerline Dataset

Road & Stop Database Metadata

<div><div>Identify</div><div>Identify from: Waste_Services_Collection_Roads_04_17_2014</div><div>Waste_Services_Collection_Roads_04_17_2014</div><div>ROUTE 3</div><div>Location: 633,821.915 5,008,839.332 Meters</div><table><thead><tr><th>Field</th><th>Value</th></tr></thead><tbody><tr><td>COMMENT</td><td></td></tr><tr><td>GUIDE</td><td>Y</td></tr><tr><td>GUIDE_KO</td><td>Y</td></tr><tr><td>GUIDE_ZONE</td><td>HUN ROUTE 3 THURSDAY WEEK 1</td></tr><tr><td>Id</td><td>0</td></tr><tr><td>JOIN_FIELD</td><td>225.995613</td></tr><tr><td>LH_ADD</td><td>358</td></tr><tr><td>LL_ADD</td><td>316</td></tr><tr><td>MAP</td><td>4E</td></tr><tr><td>MUN</td><td>HUN</td></tr><tr><td>Name_of_Rd</td><td>MUSKOKA RD 10</td></tr><tr><td>OBJECTID</td><td>3419</td></tr><tr><td>PickUp_Dat</td><td>WEEK 1</td></tr><tr><td>PickUp_Day</td><td>THURSDAY</td></tr><tr><td>RH_ADD</td><td>357</td></tr><tr><td>RL_ADD</td><td>315</td></tr><tr><td>Route_Name</td><td>ROUTE 3</td></tr><tr><td>Seasonalit</td><td>Y</td></tr><tr><td>Shape</td><td>Polyline</td></tr><tr><td>Shape_Length</td><td>225.995613</td></tr><tr><td>WS_ROAD_TY</td><td>DISTRICT</td></tr></tbody></table><div>Identified 1 feature</div><div>Table Of Contents Table Identify</div></div>	Field	Value	COMMENT		GUIDE	Y	GUIDE_KO	Y	GUIDE_ZONE	HUN ROUTE 3 THURSDAY WEEK 1	Id	0	JOIN_FIELD	225.995613	LH_ADD	358	LL_ADD	316	MAP	4E	MUN	HUN	Name_of_Rd	MUSKOKA RD 10	OBJECTID	3419	PickUp_Dat	WEEK 1	PickUp_Day	THURSDAY	RH_ADD	357	RL_ADD	315	Route_Name	ROUTE 3	Seasonalit	Y	Shape	Polyline	Shape_Length	225.995613	WS_ROAD_TY	DISTRICT	<div><div>Identify</div><div>Identify from: Waste_Services_GIS_Stop_Points_04_17_2014</div><div>Waste_Services_GIS_Stop_Points_04_17_2014</div><div>319 MUSKOKA RD 10 GBO</div><div>Location: 633,813.584 5,008,830.662 Meters</div><table><thead><tr><th>Field</th><th>Value</th></tr></thead><tbody><tr><td>ACCESS</td><td>Y</td></tr><tr><td>Alt_Serv</td><td>GBO</td></tr><tr><td>area_mun</td><td>4442</td></tr><tr><td>bag_Count</td><td>2</td></tr><tr><td>BB_Lmt</td><td>0</td></tr><tr><td>Coll_Day</td><td>THURSDAY</td></tr><tr><td>Curbside</td><td>Y</td></tr><tr><td>Drop_x</td><td>0</td></tr><tr><td>Drop_y</td><td>0</td></tr><tr><td>Drop_Zone</td><td>Y</td></tr><tr><td>Gar_Lmt</td><td>0</td></tr><tr><td>KO</td><td>Y</td></tr><tr><td>KO_Lmt</td><td>0</td></tr><tr><td>Location</td><td>319 MUSKOKA RD 10</td></tr><tr><td>Notes</td><td></td></tr><tr><td>OBJECTID</td><td>49278</td></tr><tr><td>PRIMESUB</td><td>4442040011075000000</td></tr><tr><td>PropCode</td><td>381</td></tr><tr><td>Property_1</td><td><null></td></tr><tr><td>PropertyNu</td><td><null></td></tr><tr><td>Route_Num</td><td>ROUTE 3</td></tr><tr><td>Routes</td><td>4442_THURSDAY_ROUTE 3_WEEK 2</td></tr><tr><td>Seas_Coll</td><td></td></tr><tr><td>Seas_Place</td><td></td></tr><tr><td>service</td><td>GBO</td></tr><tr><td>Shape</td><td>Point</td></tr><tr><td>STRUCTURE_</td><td></td></tr><tr><td>TotRoll</td><td>141000</td></tr><tr><td>UNITCL</td><td>RDU</td></tr><tr><td>Update_</td><td>21/08/2015</td></tr><tr><td>Vac_Land_P</td><td>N</td></tr><tr><td>Week_Num</td><td>WEEK 2</td></tr><tr><td>Within_50M</td><td>Y</td></tr><tr><td>XCORDNEW</td><td>633813.4674</td></tr><tr><td>YCOORDNEW</td><td>5008830.5311</td></tr></tbody></table><div>Identified 1 feature</div><div>Table Of Contents Table Identify</div></div>	Field	Value	ACCESS	Y	Alt_Serv	GBO	area_mun	4442	bag_Count	2	BB_Lmt	0	Coll_Day	THURSDAY	Curbside	Y	Drop_x	0	Drop_y	0	Drop_Zone	Y	Gar_Lmt	0	KO	Y	KO_Lmt	0	Location	319 MUSKOKA RD 10	Notes		OBJECTID	49278	PRIMESUB	4442040011075000000	PropCode	381	Property_1	<null>	PropertyNu	<null>	Route_Num	ROUTE 3	Routes	4442_THURSDAY_ROUTE 3_WEEK 2	Seas_Coll		Seas_Place		service	GBO	Shape	Point	STRUCTURE_		TotRoll	141000	UNITCL	RDU	Update_	21/08/2015	Vac_Land_P	N	Week_Num	WEEK 2	Within_50M	Y	XCORDNEW	633813.4674	YCOORDNEW	5008830.5311
Field	Value																																																																																																																				
COMMENT																																																																																																																					
GUIDE	Y																																																																																																																				
GUIDE_KO	Y																																																																																																																				
GUIDE_ZONE	HUN ROUTE 3 THURSDAY WEEK 1																																																																																																																				
Id	0																																																																																																																				
JOIN_FIELD	225.995613																																																																																																																				
LH_ADD	358																																																																																																																				
LL_ADD	316																																																																																																																				
MAP	4E																																																																																																																				
MUN	HUN																																																																																																																				
Name_of_Rd	MUSKOKA RD 10																																																																																																																				
OBJECTID	3419																																																																																																																				
PickUp_Dat	WEEK 1																																																																																																																				
PickUp_Day	THURSDAY																																																																																																																				
RH_ADD	357																																																																																																																				
RL_ADD	315																																																																																																																				
Route_Name	ROUTE 3																																																																																																																				
Seasonalit	Y																																																																																																																				
Shape	Polyline																																																																																																																				
Shape_Length	225.995613																																																																																																																				
WS_ROAD_TY	DISTRICT																																																																																																																				
Field	Value																																																																																																																				
ACCESS	Y																																																																																																																				
Alt_Serv	GBO																																																																																																																				
area_mun	4442																																																																																																																				
bag_Count	2																																																																																																																				
BB_Lmt	0																																																																																																																				
Coll_Day	THURSDAY																																																																																																																				
Curbside	Y																																																																																																																				
Drop_x	0																																																																																																																				
Drop_y	0																																																																																																																				
Drop_Zone	Y																																																																																																																				
Gar_Lmt	0																																																																																																																				
KO	Y																																																																																																																				
KO_Lmt	0																																																																																																																				
Location	319 MUSKOKA RD 10																																																																																																																				
Notes																																																																																																																					
OBJECTID	49278																																																																																																																				
PRIMESUB	4442040011075000000																																																																																																																				
PropCode	381																																																																																																																				
Property_1	<null>																																																																																																																				
PropertyNu	<null>																																																																																																																				
Route_Num	ROUTE 3																																																																																																																				
Routes	4442_THURSDAY_ROUTE 3_WEEK 2																																																																																																																				
Seas_Coll																																																																																																																					
Seas_Place																																																																																																																					
service	GBO																																																																																																																				
Shape	Point																																																																																																																				
STRUCTURE_																																																																																																																					
TotRoll	141000																																																																																																																				
UNITCL	RDU																																																																																																																				
Update_	21/08/2015																																																																																																																				
Vac_Land_P	N																																																																																																																				
Week_Num	WEEK 2																																																																																																																				
Within_50M	Y																																																																																																																				
XCORDNEW	633813.4674																																																																																																																				
YCOORDNEW	5008830.5311																																																																																																																				

What Did We Learn?



- Using GIS systems to map & inventory curbside collection routes and stops will result in improvements to the effectiveness & efficiency of municipal waste collection system management

Record Update Script for ArcPad Edit Tracking

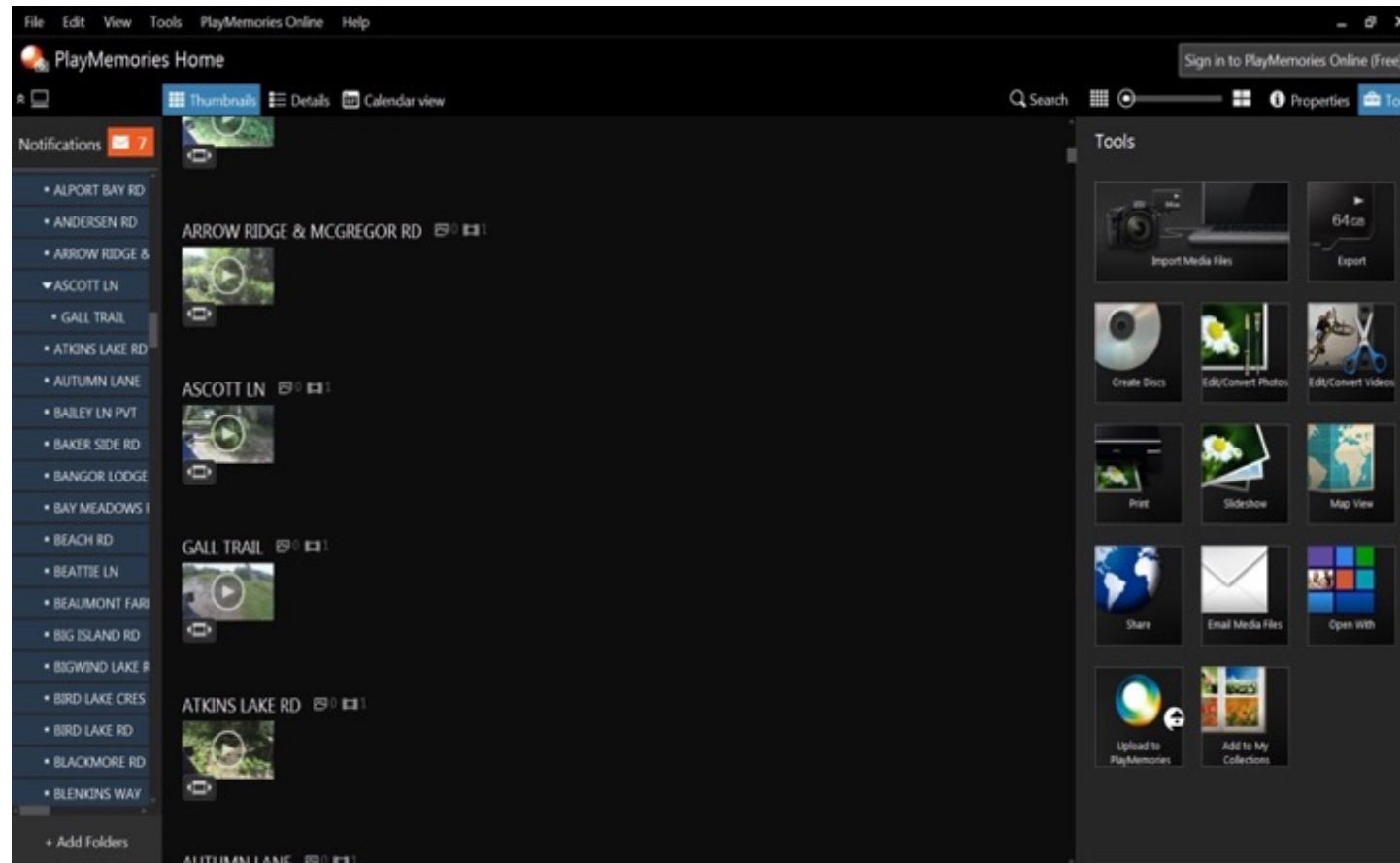
```
Update_Edit_Date

Option Explicit

Sub Automatic_date_update
    Dim objLayer, objRS, objRec, objFields, objfield
    Dim strDate
    set objLayer = thisevent.Object

    ' TO GET THE SELECTED RECORD
    set objRS = Map.SelectionLayer.Records
    objRS.Bookmark = Application.Map.SelectionBookmark
    set objFields = objRS.Fields
    strDate = CStr(formatDateTime(Date,vbShortDate))
    objFields("UPDATE_").Value = strDate
    objRS.Update
    set objRS = Nothing
End Sub
```

Point of View Video Software



Sony PlayMemories Software

Point of View Camera & Remote



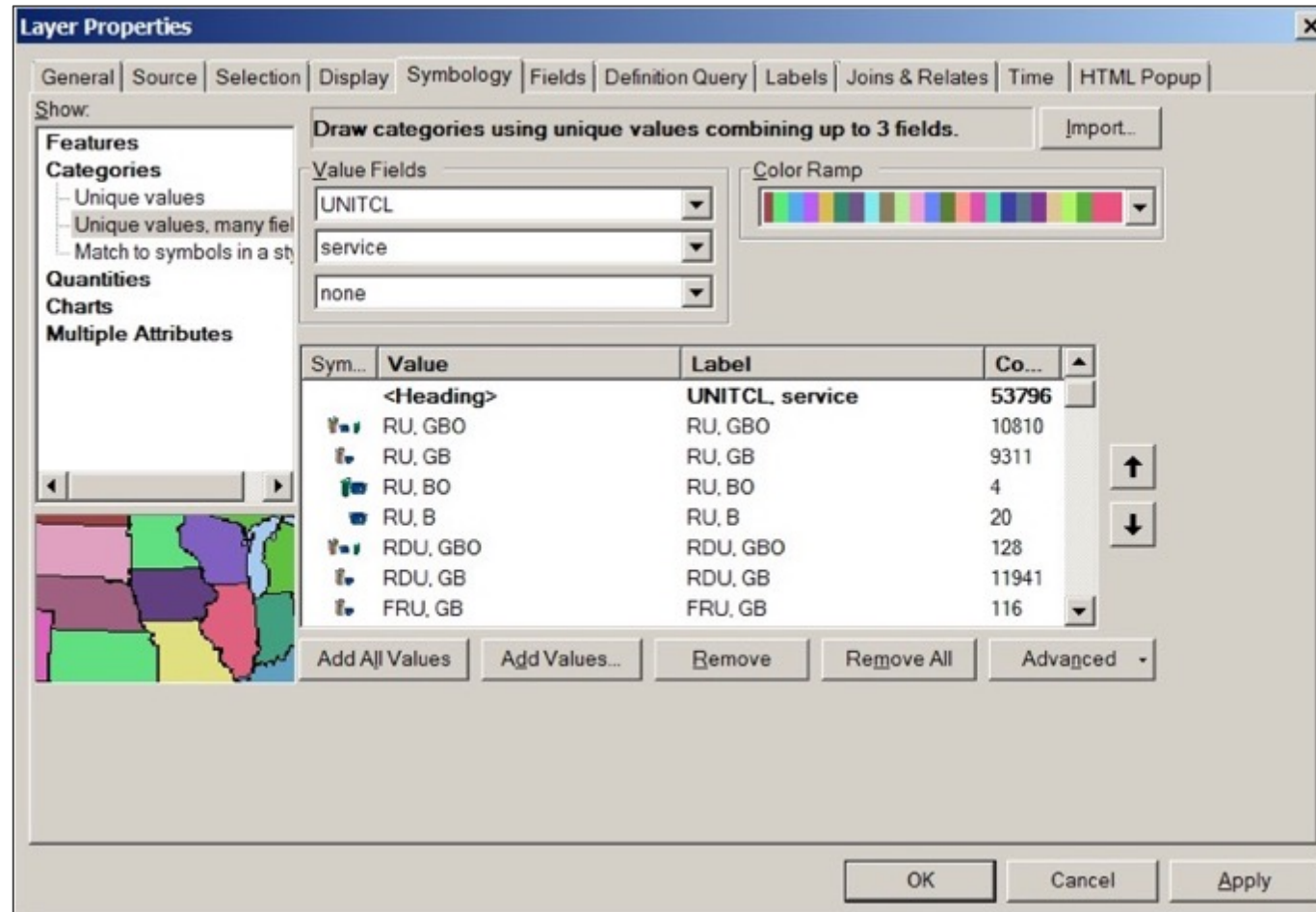
Sony HDR-AS100V & RM-LVR1 Remote

Point of View Camera Video



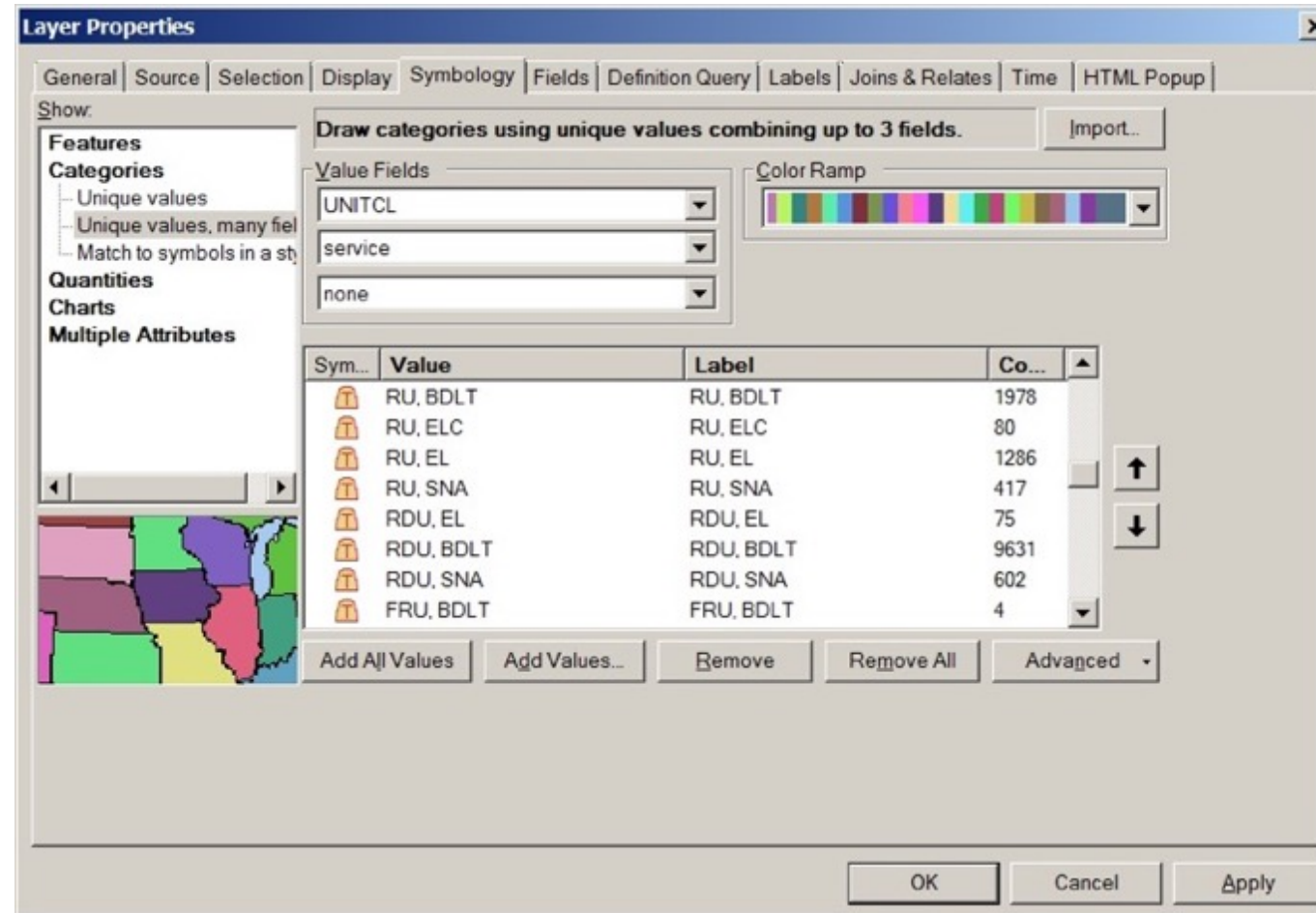
Sony HDR-AS100V

Results



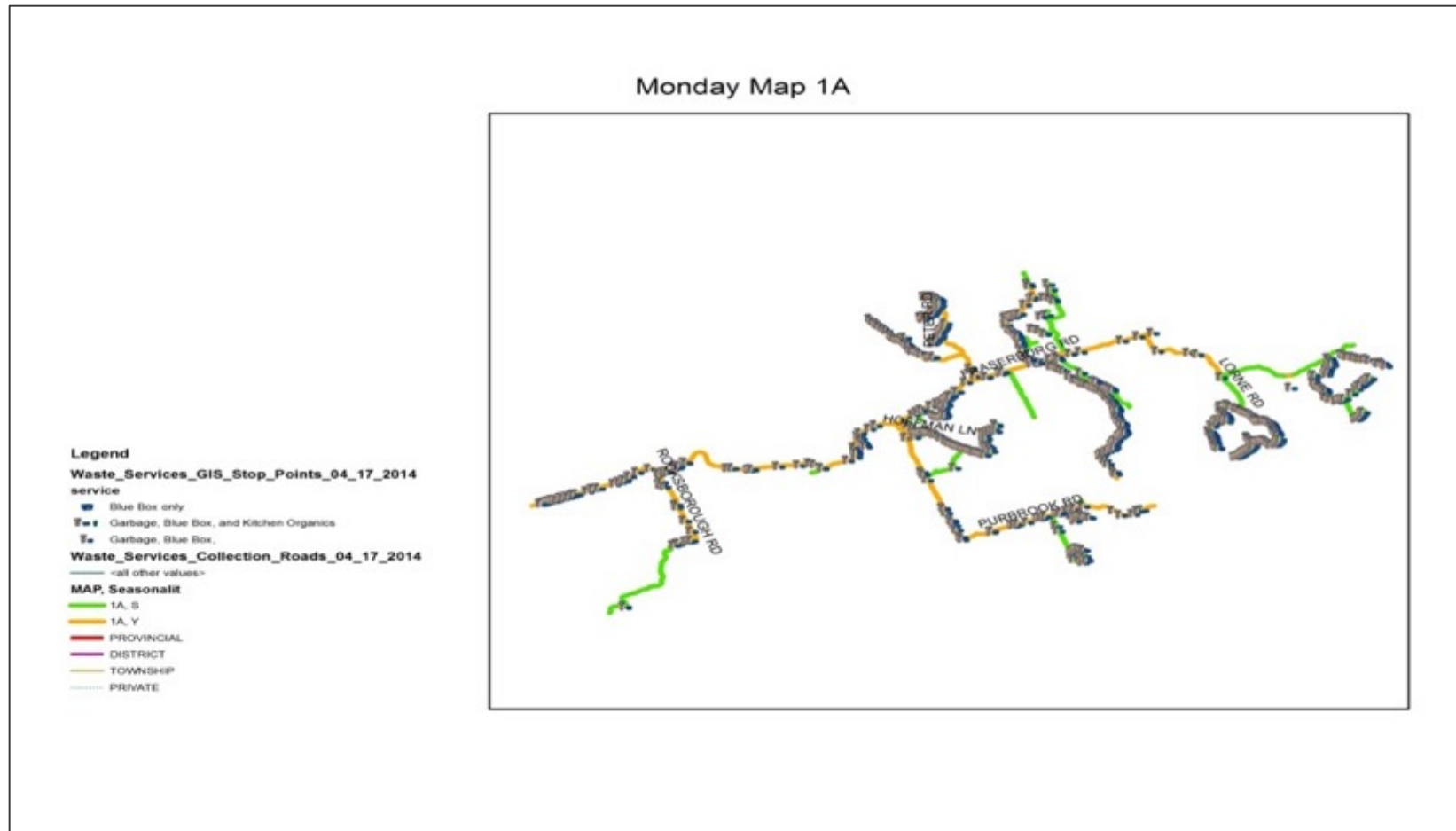
Curbside by Unit Type and Service

Results (1)



Depot by Unit Type & Service

Results (2)



Depot by Unit Type & Service

Closing Comments

- GIS-based Waste Management System Service Level Models can be developed in house with existing data
- For varied collection route types (seasonal roads) field verification is necessary for locating stops along routes
- Collection Models lead to improved efficiency & effectiveness

MRF Mass Balance Study Trends: How the Findings Can Help You

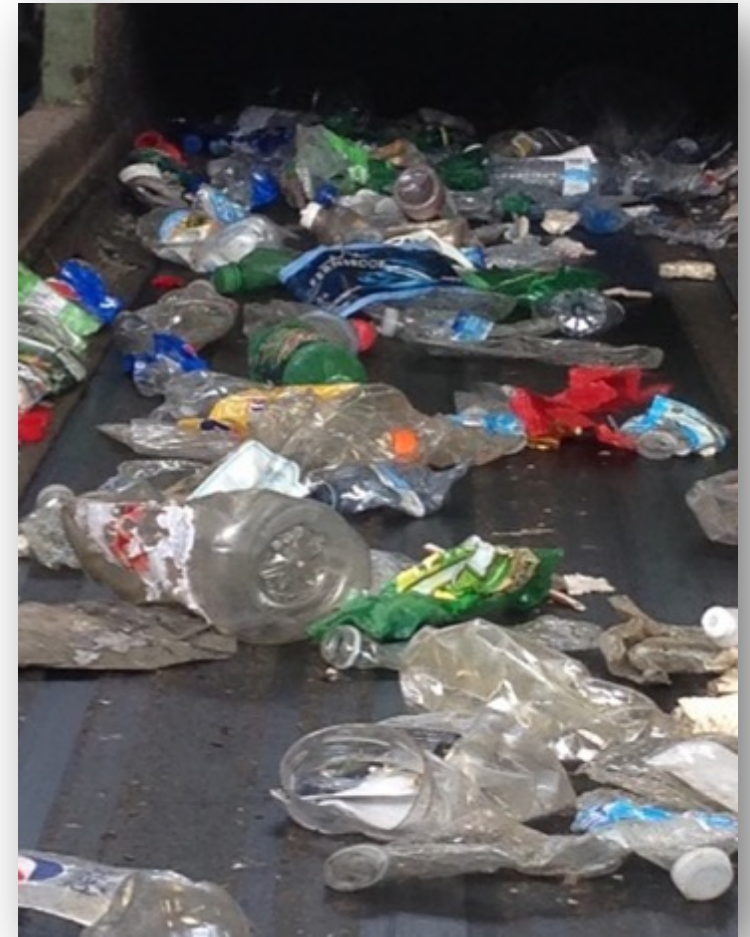
Carrie Nash
CIF Project Manager

Background

- Performance Audit funding available through the REOI
- Funded Audits in 5 facilities
 - 2 single stream
 - Peel Region, Bluewater Recycling Authority (BRA)
 - 3 dual stream
 - Hamilton, Essex Windsor Solid Waste Authority (EWSWA), Waterloo Region

MRF Performance Audits: What Are They?


- A mass balance study to determine:
 - Efficiency & effectiveness of equipment & sort stations
 - Where inefficiencies lie
 - Extent & cost of problem
 - Where improvements are most needed to improve material management & capture & drive down costs



MRF Performance Audits: How Do They Work?

Equipment/Sort Station	Target Material	Expected Efficiency	Efficiency	Purity
HDPE – Manual	HDPE	--	80%	--
Fine Screen	Glass	90%	98%	95%
OCC Screen	OCC	--	52%	85%
ONP Screen	ONP/Mixed fibre	--	84%	76%
Film Grabber	Plastic film	30%	0%	0%
Magnet	Steel	90-98%	97%	92%
Eddy Current	Food & beverage	90-95%	80%	91%
Optical Sorter	PET	90-95%	88%	95%
Dual Optical Sorter	Polycoat cartons	90-98%	60%	91%
	Mixed rigid plastics		35%	85%

MRF Performance Audits: How Do They Work?

	Material Flow 													
Commodity	Residue - Pre-Sort	Film	OCC	Glass	Mixed Fibre	Residue - Fibre Line	Steel	Aluminum	PET	Mixed Plastics	Polycoat Cartons	HDPE	Residue - End of Line	Total
Film	13%	56%	1%	0%	16%	9%	0%	0%	0%	0%	0%	0%	5%	100%
OCC	0%	0%	61%	0%	37%	1%	0%	0%	0%	0%	0%	0%	1%	100%
Glass	1%	0%	0%	92%	3%	0%	0%	0%	0%	0%	0%	0%	4%	100%
Mixed Fibre	2%	0%	3%	0%	88%	1%	0%	0%	0%	0%	0%	0%	5%	100%
Steel	2%	0%	0%	0%	9%	0%	82%	0%	0%	0%	0%	0%	6%	100%
Aluminum	2%	0%	1%	0%	14%	2%	0%	72%	0%	0%	0%	0%	7%	100%
PET	2%	0%	1%	0%	12%	1%	0%	0%	79%	2%	0%	0%	4%	100%
Mixed Plastics	15%	0%	6%	0%	24%	5%	0%	0%	1%	25%	0%	0%	23%	100%
Polycoat Cartons	1%	0%	0%	0%	28%	1%	0%	3%	1%	0%	51%	0%	16%	100%
HDPE	1%	0%	2%	0%	2%	1%	0%	0%	1%	4%	0%	81%	8%	100%
Residue	21%	6%	1%	5%	27%	12%	0%	0%	2%	0%	0%	0%	24%	100%

MRF Performance Audits: How Do They Work?

Materials	Avail. Tonnes	Capture Rates (%)	Captured (tonnes)	Expected Revenue (\$)	Actual Revenue (\$)	Net Diff. (\$)
Aluminum Prime	626	84%	528	\$1,095,000	\$923,000	-\$172,000
Aluminum B-Grade	87	63%	54	\$98,000	\$62,000	-\$37,000
PET	2,842	73%	2,078	\$1,125,000	\$822,000	-\$303,000
HDPE	993	81%	806	\$607,000	\$493,000	-\$114,000
Mixed Plastics	1,406	43%	606	\$77,000	\$33,000	-\$44,000
Film	1,116	55%	615	\$0	\$0	\$0
Cartons	376	74%	277	\$40,000	\$30,000	-\$11,000
Steel	1,372	94%	1,288	\$423,000	\$397,000	-\$26,000
Glass	3,100	98%	3,034	-\$85,000	-\$84,000	\$2,000
TOTAL	11,917	78%	9,286	\$3,380,000	\$2,677,000	-\$704,000

MRF Performance Audits: Why Undertake One?

- Determine effect on MRF performance & material management with:
 - Single vs. dual stream
 - Changes to packaging mix
 - Inbound composition shifts (lighter, smaller, composite materials)
 - Contamination
 - Resident confusion, apathy
 - Impact of hard to serve sectors on MRF
 - MR public areas such as parks
 - Market fluctuations
 - Price drops, market closures, foreign policy changes

Inbound Material Mix

- Stark difference between sites
 - Ranged from ultra clean to heavily contaminated
- Continuing evidence of light-weighting
 - More film & small rigid plastics
 - Less newspaper & fine paper



Contamination



- Impacts sorting efficiencies, capture rates & bale purity
- Dual stream challenge
 - Cross contamination
- Single stream challenge
 - Medical waste, scrap metal, oversized wasted, electronics
 - Downtime

Equipment & Material Handling

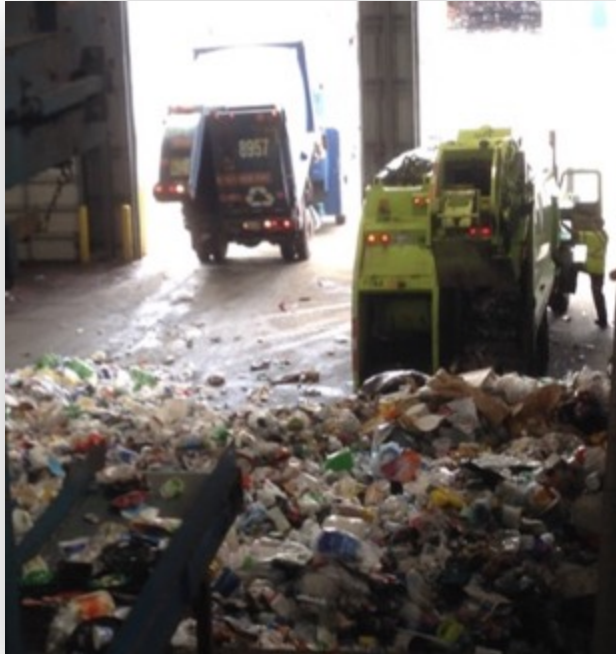
- Audit helped quantify the problem
 - Film plastic management in Hamilton
- Audit sometimes revealed small, easy fixes
 - Air compressor in EWSWA
- Equipment configuration & maintenance matters
 - Clean up material as much as possible before the optical
 - Proper maintenance to avoid downtime & costly repairs
- Sometimes an equipment fix doesn't exist
 - Bag breaker for small tied off grocery bags
 - Plastic film capture

Other Themes & Trends



- Residue
 - Monitor throughout process to determine where the leak is
- Material Capture
 - Low capture rates for high value materials
- Equipment
 - Neglected record keeping leads to overspending on maintenance
 - Dual eject optical sorters underperform

Key Takeaway: We Need to Widen Our Approach



Collection

Processing

Markets

Markets

Processing

Collection

P&E

Policy &
Enforcement

Key Takeaway



- MRF audits are barometer of performance, & key indicator of where time & budgets would yield best return on investment
- Visit CIF Projects web page for individual reports for each site

Questions



CIF

CONTINUOUS
IMPROVEMENT FUND

Enjoy Your Break

