

DON'T TRASH YOUR CASH: PLANNING FOR SOLID WASTE MANAGEMENT & INFRASTRUCTURE

Presenters: Tara Albert & Paige Wilson



NH Municipal Association Conference – November 17, 2022

Overview

Full Cost Accounting (FCA)

- What is it?
- Why is it important? – NH Examples
- Connection to 2022 Solid Waste Management Plan (SWMP)
- How to execute FCA
- Sample results
- Q&A



What is Full Cost Accounting?

- A reporting system developed by the US EPA
- A systematic approach for identifying and characterizing the cost of providing solid waste services
- Groups expenses into 4 “Paths”
 - Recycling
 - Waste to Energy (WtE)
 - Composting
 - Landfilling

Full Cost Accounting is NOT

- An audit
- A strict accounting system
- A time & motion study
- “True Cost” (does not include social, environmental, or public health costs)

FCA does not account for wastes that do not come through a solid waste transfer station (e.g., sludge)

FCA may not account for HHW Event costs.



FCA vs. Cash Flow Accounting

All resources used or committed

VS.

Current outlays of cash
("the budget")



Guiding Documents

The image displays three overlapping document covers. The top-left cover is titled "Full Cost Accounting for Municipal Solid Waste Management: A Guide to Case Studies of Municipalities Using Full Cost Accounting" and features a red and black geometric design with a large red cross. The top-right cover is titled "Making Solid (Waste) Decisions With Full Cost Accounting" and has a white background with the EPA logo. The bottom cover is titled "Full Cost Accounting for Municipal Solid Waste Management in Florida" and features the Florida Department of Environmental Protection logo. The word "Amortization" is written vertically in a stylized font on the left side of the overlapping covers. The EPA logo is visible on the top-left and bottom covers.

EPA Full Cost Accounting for Municipal Solid Waste Management: A Guide to Case Studies of Municipalities Using Full Cost Accounting

EPA Making Solid (Waste) Decisions With Full Cost Accounting

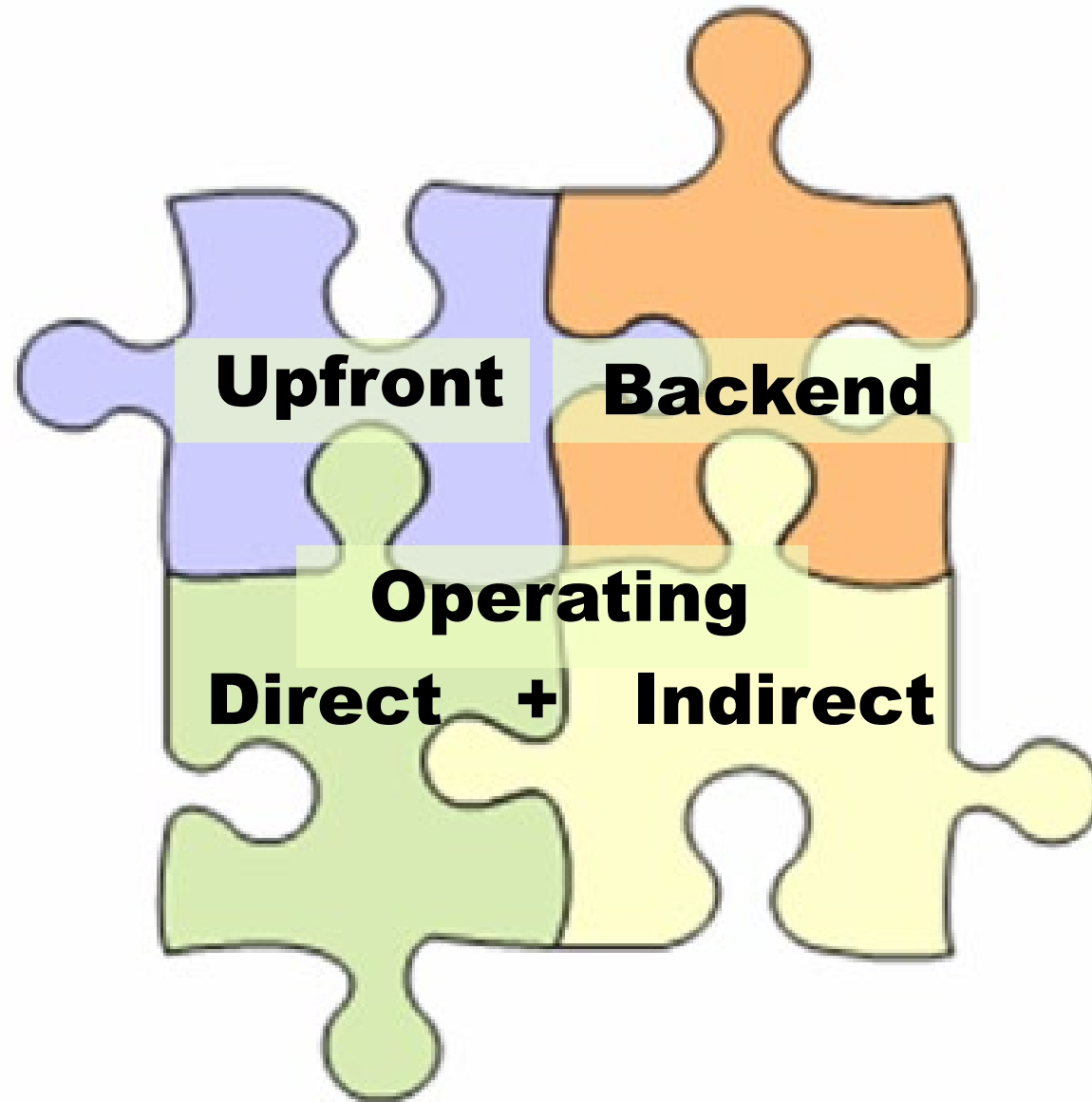
EPA Full Cost Accounting for Municipal Solid Waste Management in Florida

Amortization

Amortization

Printed on paper that contains at least 30 percent postconsumer fiber.

Inputs



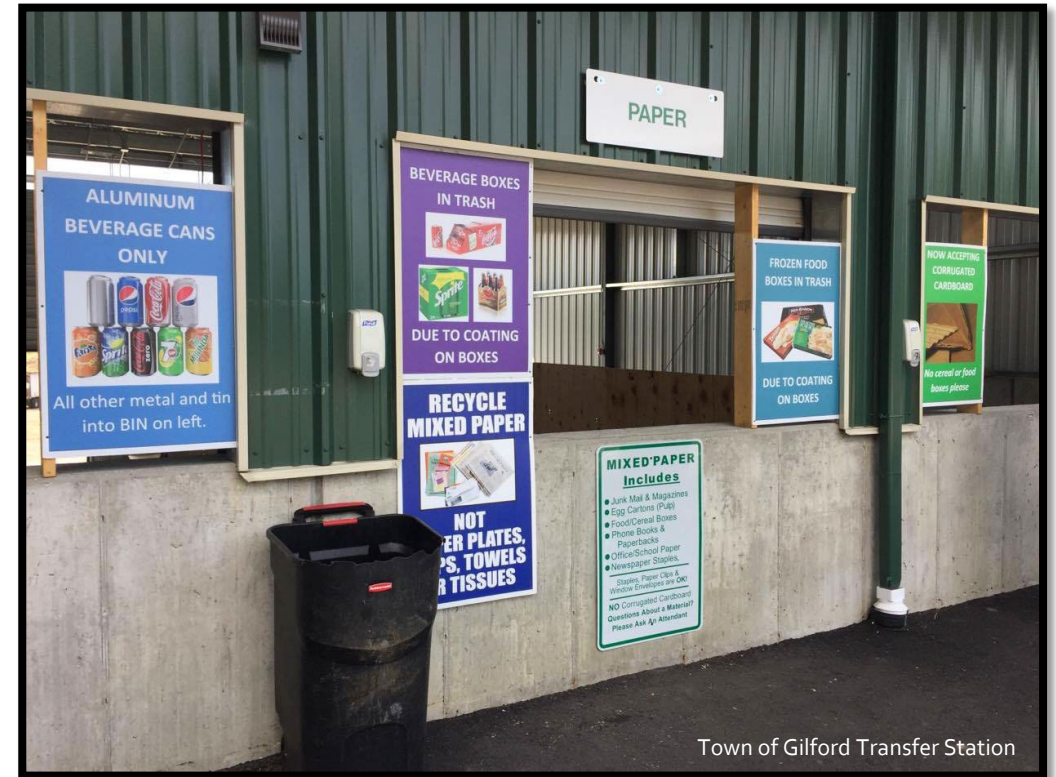
Outputs

- Net unit cost (\$/ton) for each path
- Pie charts of cost breakdowns
- Average waste generation and cost per person

	Recycle	Compost	W-T-E	Landfill
Total Cost (-)	\$\$\$	\$\$	\$	\$\$\$\$\$
Revenue (+)	\$		\$	\$\$
Net cost (-)	\$\$	\$\$	0	\$\$\$
Tons	500	30	10	700
\$/ton	\$/ton	\$/ton	\$/ton	\$/ton

Uses & Benefits

Is Recycling Worth it?



Town of Gilford Transfer Station

Uses & Benefits of Full Cost Accounting

- Making data-driven decisions
- Financial planning (capital purchases, etc.)
- Setting goals (recycling, waste reduction)
- Setting Pay-As-You-Throw rates
- Setting disposal fees
- Evaluating program changes
- Educating residents
- Negotiating with vendors

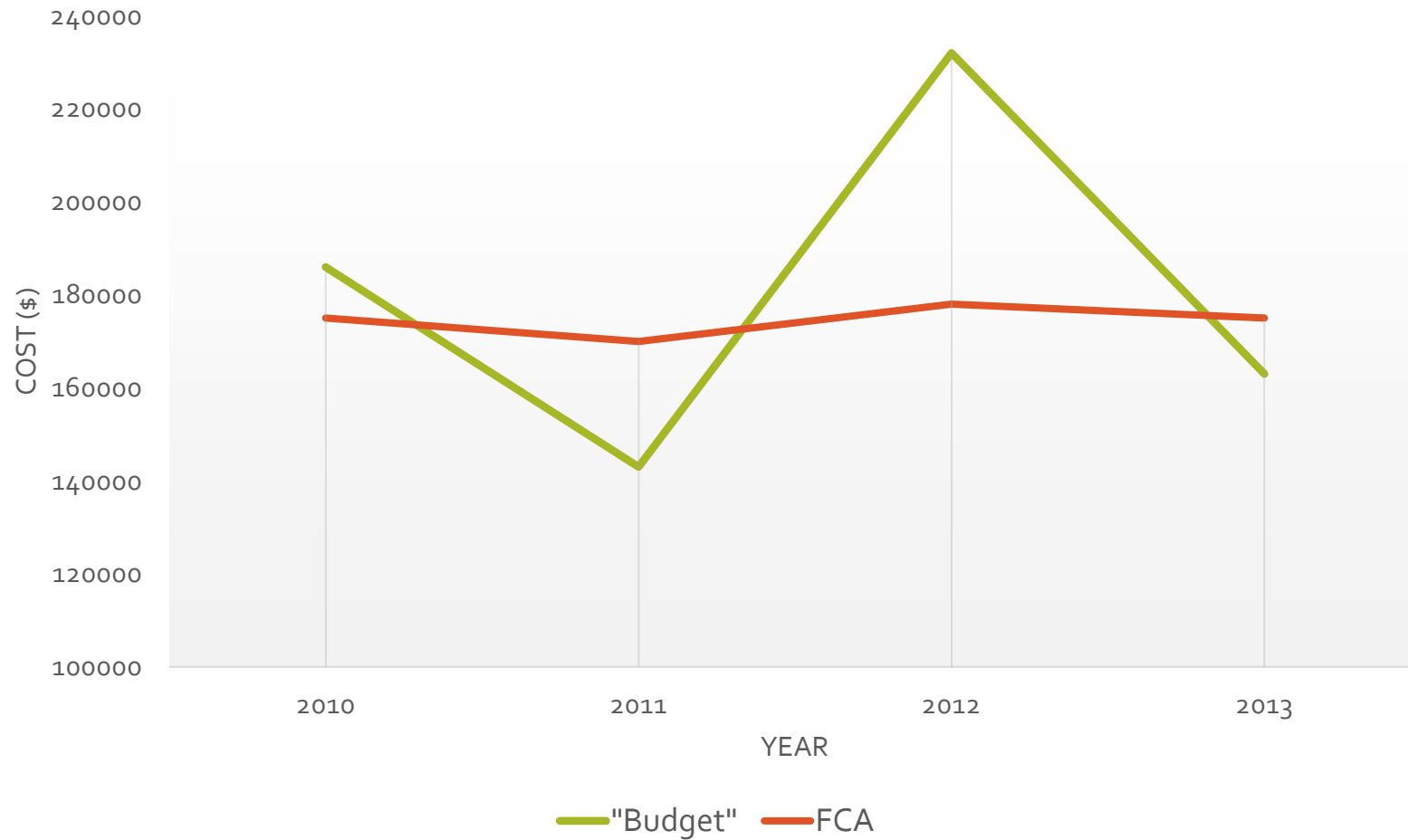


(forklift)
Town of Gilford Transfer Station

Why do FCA?

Smooth out the peaks & valleys of expenses over time

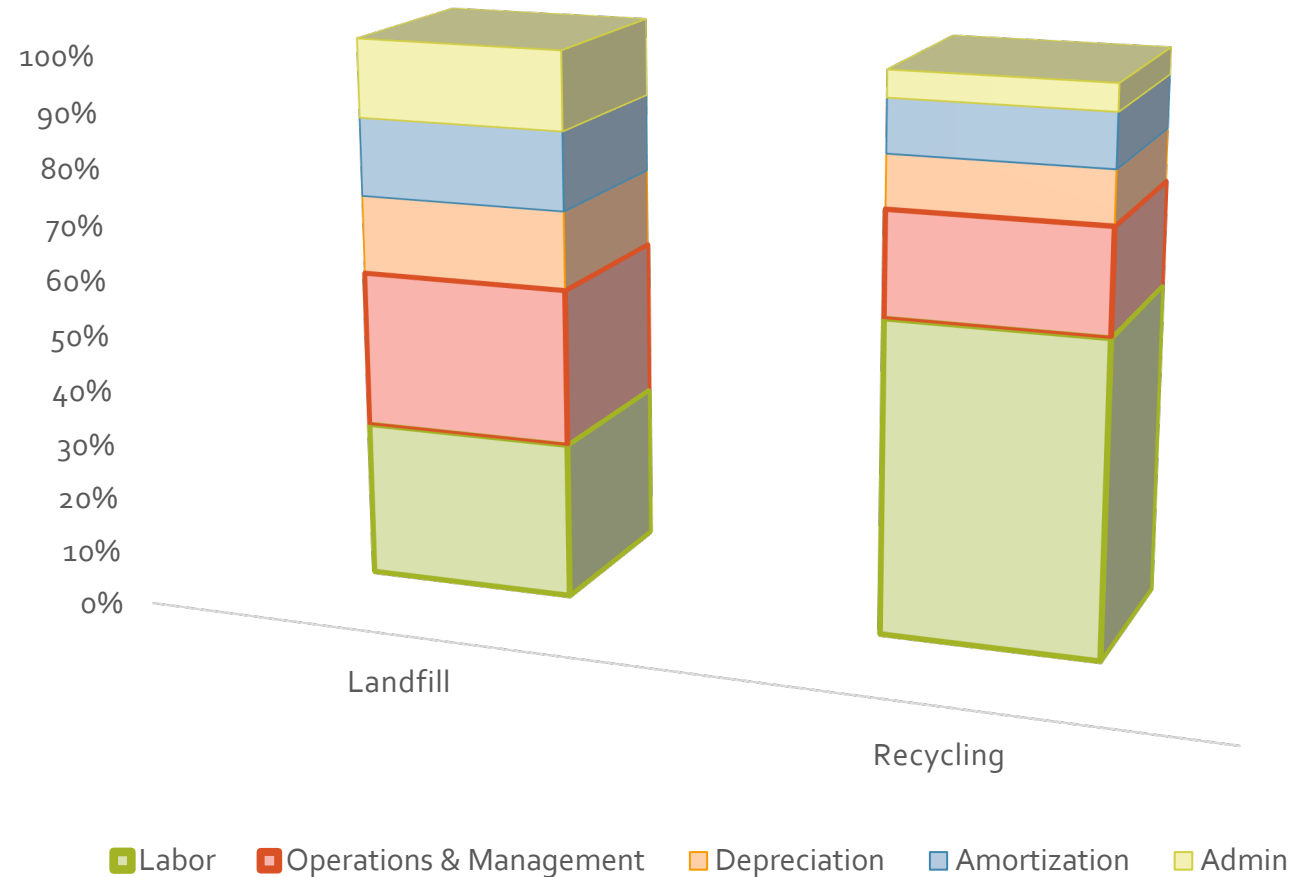
"Budget" vs. Full Cost Accounting Report



Why do FCA?

Look for areas of inefficiency

Cost Breakdown



FCA Examples in NH

2012-2015 – No
some changes a

to make
SW costs.

Take Aways

NHDES SWOT P

- 2021 – LRPC a
 - Justify large
 - Identify ineff
 - Projects are

- The process takes time.
- You need to be able to relay the information back to townspeople in an understandable way.
- In some cases, hard decisions need to be made.
- You CANNOT keep pushing solid waste management to the back burner.

realized.

Northeast Reso

rural towns.

Case Example – Gilford, NH

Analyzed facility fees for
Construction & Demolition (C&D)

- Data showed only 55% of their costs covered by fees
- Costing town ~\$40,000 beyond fees
- Why? Hard for staff to estimate volume brought in by “eyeballing it.”
- Used data to get town approval to purchase truck scale.
 - Weight-based fees.



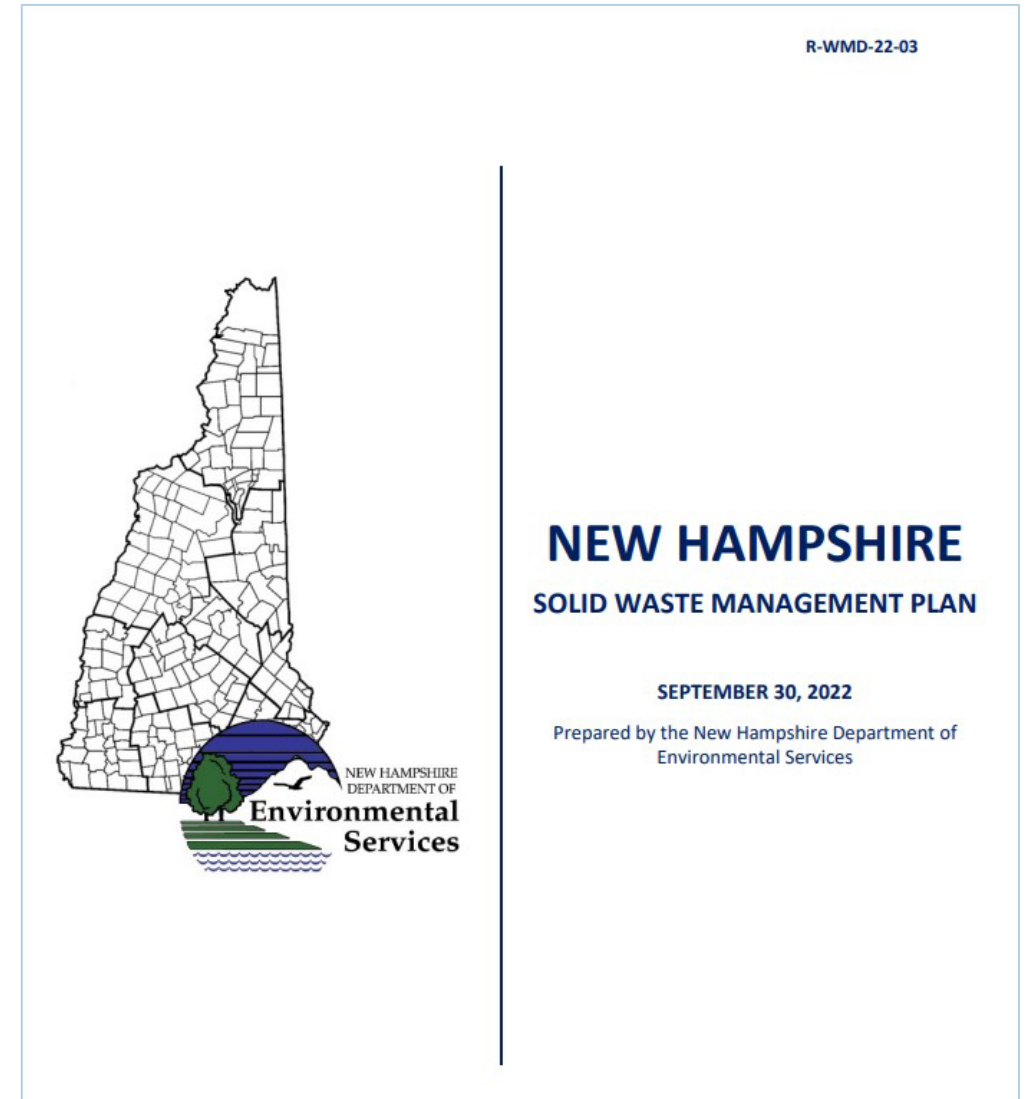
The NEED for FCA

2022 New Hampshire Solid Waste Management Plan

- 8 Goals in SWMP
- Statewide goal (RSA 149-M:2)
 - Applies to ALL waste disposed in NH

*Reduce disposal of municipal solid waste (MSW) and construction and demolition debris (C&D) by 25% by 2030 and by 45% by 2050.**

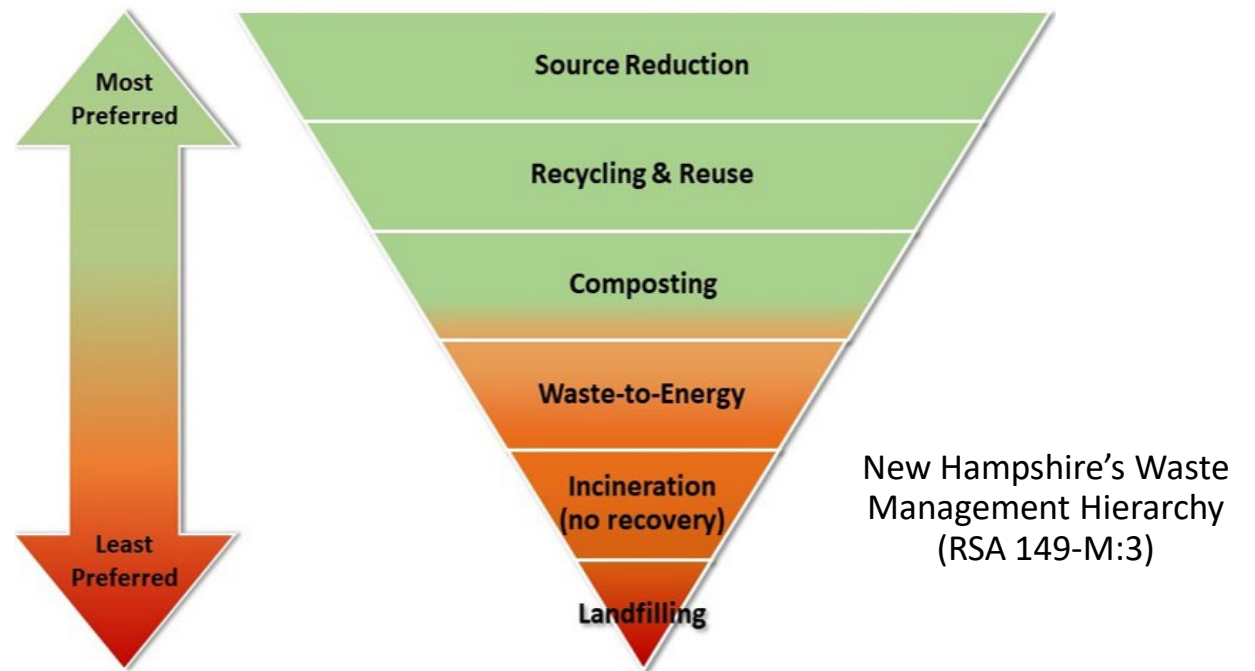
Infrastructure is fundamental to successfully achieve these goals.



*Baseline: 2018 disposal data

Tying FCA to SWMP Goals

- Goal 3: **Maximize the diversion** of residential, commercial, and industrial solid waste from disposal.
- Goal 4: Ensure adequate **capacity** for management of New Hampshire-generated waste.
- Goal 5: Develop **local markets** for waste diversion.
- Goal 6: Encourage solid waste infrastructure and practices that support State and Federal **climate change** initiatives.





FCA FOR YOUR FACILITY

How do I execute a
FCA assessment?

Input Data?

- Annual Facility Report (AFR)
- Facility Manager interview
- Expenditure reports
- Capital asset list
- Capital improvement plan
- Revenue reports
- Municipal annual report



Information to Bring SW Facility Managers, Part II Full Cost Accounting

Checklist

- Copy of annual solid waste report (tonnage for MSW, C&D, recyclables, compost, etc.) as submitted to NHDES.
- Solid waste revenue figures (bulky waste fees, permits, bag sales, grants, etc.)
- Property & liability insurance expense for the town (should be shown in budget)
- Workers comp & unemployment insurance for the solid waste department employees
- Debt service for solid waste facilities (landfill, buildings, vehicles, equipment, etc.), if any.
- Copy of the town's capital asset list, if available, or a list of all equipment used at solid waste including purchase price, year of purchase, and useful life.
- Copy of the town's capital improvement program, if available, or a schedule of planned equipment purchases for solid waste.
- Sum total of Wages & benefits for management/administrative staff including;
 - Town Manager
 - Finance officer/bookkeeper
 - Human resources director
- Total number of employees working at Town Hall
- Number of Town Hall employees who perform functions for solid waste (payroll, HR, admin, oversight, permit/sticker sales, etc.)
- Sum total of Operating costs for Town Hall building (heat, electric, maintenance, phone, etc. usually acct 4194)
- Total administrative budget for the town (usually accts 4130 & 4150)
- Total general fund expenditures for the town
- Balances of any CRF, SRF the town has for solid waste, plus info on source of revenue, and amounts received / expended in the year of interest.

The Workbook

GENERAL OPERATIONS AND MAINTENANCE											
Year of Interest:											
											FORM 2 - Page 1 of 2
Description of Expenditure	Cost Center (if applicable)	Total Annual Cost (\$)	Allocation of Annual O & M Costs by Program Area								
			Landfilling		Waste-to-Energy		Recycling		Composting		
			%	\$	%	\$	%	\$	%	\$	
1 Electricity				-		-		-		-	0%
2 Heating fuel				-		-		-		-	0%
3 Debt Service				-		-		-		-	0%
4 Rent				-		-		-		-	0%
5 MSW waste disposal fees				-		-		-		-	0%
6 C&D disposal fees				-		-		-		-	0%
7 Gasoline				-		-		-		-	0%
8 Diesel fuel				-		-		-		-	0%
9 Vehicle maintenance				-		-		-		-	0%
10 Tire disposal				-		-		-		-	0%

- Microsoft Excel

- 6 "Forms"

- 16 sheets total plus some scratch sheets

- Automatic totals, summaries, and charts

6 Main Worksheet Forms

4	3	Description of Expenditure	Cost Center (if applicable)	Total Annual Cost (\$)	Allocation of Annual O & M Costs by Program Area					
					Landfilling	Waste-to-Energy		Recycling		
						%	\$	%	\$	
6	1	Warrant article #15 capital expense		25,936.00	54%	13,876	0%	-	46%	11,931
7	2	Mileage & training		1,289.00	54%	690	0%	-	46%	593
8	3	uniforms		1,555.00	54%	832	0%	-	46%	715
9	4	telephone		984.00	54%	526	0%	-	46%	453
10	5	Professional services		1,321.00	54%	707	0%	-	46%	608
11	6	electricity		4,293.00	54%	2,297	0%	-	46%	1,975
12	7	Heating fuel			54%	-	0%	-	46%	-
13	8	Water & sewer		120.81	54%	65	0%	-	46%	56
14	9	Bldg, equip, vehicle maint.	430, 630, 660	581.00	54%	311	0%	-	46%	267
15	10	Dues		147.00	54%	2,219	0%	-	46%	1,908
16	11	supplies		277.00	54%	148	0%	-	46%	127
17	12	Fuel		1,407	54%	1,407	0%	-	46%	1,209
18	13	Disposal fees	01-813, 07-813	64,719.80	100%	64,720	0%	-	0%	-
19	14	Disposal fees, Recycling	04-813, 05-813, 06-813	5,131.00	0%	-	0%	-	100%	5,131
20	15	Hauling Fees	02-813	9,288.00	100%	9,288	0%	-	0%	-
21		TOTALS		\$ 122,271.61		97,084		-		24,972

1. Labor (wages & benefits)

2. Operation & maintenance

3. Depreciation of capital items

4. Amortized future costs

5. Indirect/Administrative Costs

6. Summary

Most forms have 2 parts:

1. Compile total costs

2. Assign costs to solid waste paths

16	11	supplies		277.00	54%
17	12	Fuel		2,629.00	54%
18	13	Disposal fees	01-813, 07-813	64,719.80	100%
19	14	Disposal fees, Recycling	04-813, 05-813, 06-813	5,131.00	0%
20	15	Hauling Fees	02-813	9,288.00	100%
21	TOTALS			\$ 122,271.61	
22					
23					
24					

Wages1 Wages2 ← OandM OandM_2 Depreciation1 Depreciation2

Key Considerations

- Separating costs among “Paths” (recycling, composting, etc.)
- Operation & maintenance
- Depreciation (equipment/facility)
- Amortized future costs
- Indirect cost allocation



Town of Lebanon – Municipal Composting Program and Transfer Station

Allocating Direct Costs

Method 1. Labor Ratio

Solid Waste Path	Labor (hrs. per week)	Labor Ratio Portion
Landfilling	36.5	42%
Waste-to-Energy	0	0%
Recycling	49	57%
Composting	1	1%
TOTALS	86.5	100%

Method 2. Tonnage Ratio

Solid Waste Path	Annual Tonnage	Tonnage Fraction
Landfilling	307	44.8%
Waste-to-Energy	0	0%
Recycling	375	54.7%
Composting	3	0.4%
TOTALS	685	100%

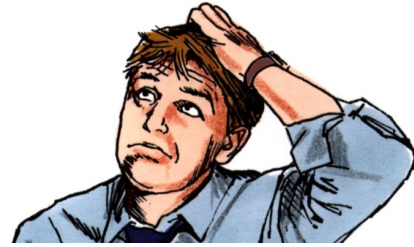
EXAMPLE; WAGES FORM – PART 1

	A	B	C	D	E	F	G	H
1	WAGES AND BENEFITS							
2		Year of Interest: _____						FORM 1 - Page 1 of 2
3				Total Annual Wages(\$)	Total Annual Benefits(\$)	Total Annual Post-employment	Allocation	Total Annual Wages and Benefits (\$)
4	1	Supervisor	Bill	23,580.54	1,803.91		100%	\$ 25,384.45
5	2	Attendant 1	Eric	25,493.50	1,950.25		100%	\$ 27,443.75
6	3	Attendant 2	John	157.00			100%	\$ 157.00
7	4	combined workers comp			1,066.74		100%	\$ 1,066.74
8	5	combined unemployment			176.77		100%	\$ 176.77

EXAMPLE; WAGES FORM – PART 2

	A	B	C	D	E	F	G	H	I	J	K
1	WAGES AND BENEFITS										
2		<i>Year of Interest:</i>	_____							<i>FORM 1 - Page 2 of 2</i>	
3			Total Annual Wages and Benefits (\$)	<i>Allocation of Annual Wages and Benefits by Program Area</i>							
4	Employee or Group			Landfilling		Waste-to-Energy		Recycling		Composting	
5				%	\$	%	\$	%	\$	%	\$
6	1	Supervisor	25,384	42%	10,661	0%	-	58%	14,723	0%	-
7	2	Attendant 1	27,444	42%	11,526	0%	-	57%	15,643	1%	274
8	3	Attendant 2	157	42%	66	0%	-	57%	89	1%	2
9	4	combined workers comp	1,067	42%	448	0%	-	57%	608	1%	11
10	5	combined unemployment	177	42%	74	0%	-	57%	101	1%	2

Tricky Inputs



- Admin/Indirect Costs
- Equipment purchases
- Shared equipment
- Shared personnel (FT/PT)



Tricky Inputs - Administrative

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures
FINANCIAL ADMINISTRATION				
01-4150.10-110	FA Administrative Assistant	31949.00	32025.60	32025.60
01-4150.10-111	FA Selectmen's Office staff	20384.00	16922.50	16922.50
01-4150.10-113	FA Budget Comm Clerk Salary	1.00	0.00	0.00
01-4150.10-114	FA Sel. Off.Overtime	1.00	2793.60	2793.60
01-4150.10-250	FA Tax Map	2500.00	2440.00	2440.00
01-4150.10-260	FA Town Report	2000.00	1868.00	1868.00
01-4150.10-301	FA Auditing	15000.00	14500.00	14500.00
01-4150.10-390	FA Office Equipment	650.00	1313.57	1313.57
01-4150.10-603	FA Office Equip. Maintenance	700.00	506.46	506.46
01-4150.10-604	FA Association Dues	1490.00	2714.40	2714.40
01-4150.10-620	FA Office Supplies	2500.00	2216.68	2216.68
01-4150.10-621	FA Computer Software Support	6000.00	4445.08	4445.08
01-4150.10-622	FA Summit CAMA	901.00	750.00	750.00
01-4150.10-625	FA Postage	1800.00	1215.67	1215.67
01-4150.10-740	FA Telephone	1300.00	1715.03	1715.03

FIGURING ADMIN COSTS

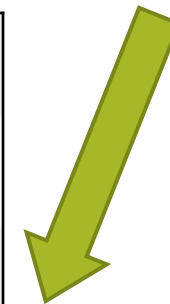
Method 1. Personnel Ratio

A	Total number of SW Employees	4.5
B	Number of employees in shared services	10
C	Total number of Municipal Employees	48.1
D	Employee Ratio = A / (C - B)	11.8%

Which one to use?
:
:
Pick the LOWER %.

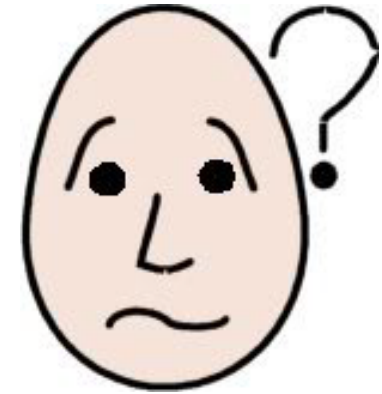
Method 2. Budget Ratio

A	Solid Waste Department Budget	\$ 317,536
B	Budget of Shared Services	\$ 607,705
C	Annual Town/City Budget	\$ 6,981,285
D	Budget Ratio = A / (C - B)	5.0%



More Tricky Inputs

Equipment purchase with CRF



Item	Category/Form	Expense	Revenue
Baler Purchase	#2 – O&M	\$ 40,000	
Use of CRF	#6 – Revenue		\$ 20,000
\$ into CRF	#2 – O&M	10,000	
Depreciation	#3 – Deprec.	2,000	
\$ into SRF	#2 – O&M	6,000	8,000
TOTAL		58,000	28,000
NET COST			\$ 30,000

Pop Quiz: Which path do ALL these amounts belong in?

ANSWER: RECYCLING

(Even) More Tricky Inputs, Part 1

PATH

Fund: GENERAL FUND



Period

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures	Encum
01-4920.00-025	Tr Sta Storage Trailers ✓	12375.00	7875.00	7875.00 ✓	
01-4920.00-026	NO. CTRY ELDER PROGRAMS-MEALS	350.00	350.00	350.00	
01-4920.00-030	Town Master Plan Update	15000.00	4155.00	4155.00	
01-4920.00-031	LANDFILL CLOSURE WARRANT ART	7432.00	1099.00	1099.00 ✓	
01-4920.00-032	OFFICE PHOTOCOPIER	0.00	0.00	0.00	
01-4920.00-033	HIGHWAY PLOW TRUCK WARRANT ART	0.00	0.00	0.00	
01-4920.00-035	TOWN HALL ENERGY IMPROVEMENTS	0.00	0.00	0.00	
01-4920.00-036	FD Gear Extractor	0.00	6389.00	6389.00	
01-4920.00-039	COMPUTER TECHNOLOGY	0.00	5932.31	5932.31	
01-4920.00-040	AMBULANCE ART	0.00	0.00	0.00	
01-4920.00-041	WEEKS MED CTR NRTHWDS HMHLTH&H	1167.00	1167.00	1167.00	
01-4920.00-044	TRFR STN BULKY WASTE ✓	20000.00	18970.68	18970.68 ✓	
01-4920.00-046	

R

L

?

(Even) More Tricky Inputs, Part 2

Account Number	Account Name	Current Year Budgeted	Period Expenditures	Current Year Expenditures	Encumbrances	Balance Remaining	Percent Left
01-4920.00-044	TRFR STN BULKY WASTE	20000.00	18970.68	18970.68	0.00	1029.32	5.15

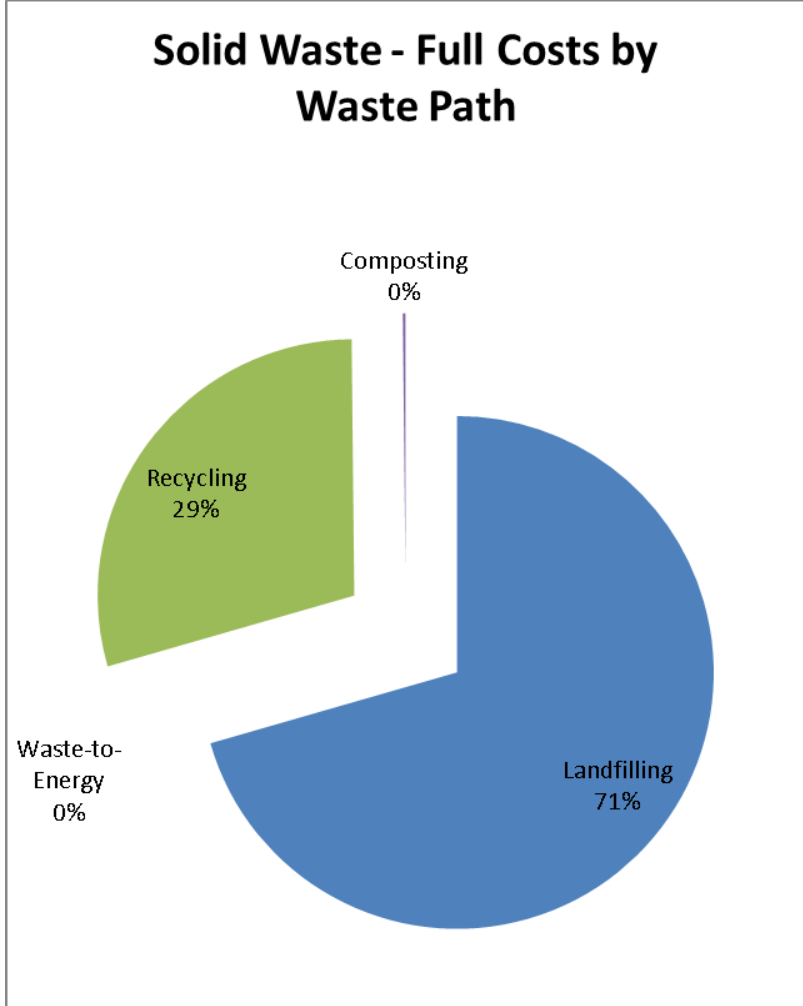
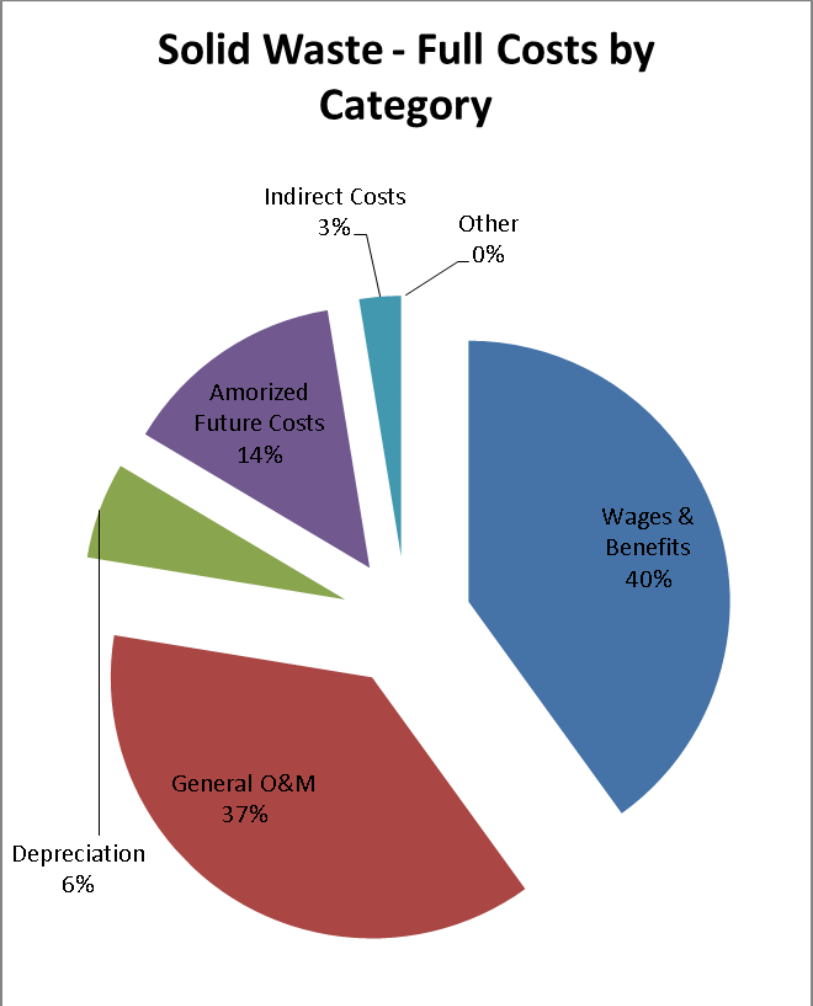
Transaction	Period	Date	Transaction Description	Vnd#	Vendor Name	Document#	Trn Amount
007239-000328	Jan 2013	03/27/13	Budget Allotment - January			BG E 80	20,000.00
Appropriation Total							20,000.00

Transaction	Period	Date	Transaction Description	Vnd#	Vendor Name	Document#	Trn Amount
007090-000003	Jan 2013	01/17/13	1505575		CASELL CASELLA WASTE MGT., INC.	AP V 025553 VE	108.42
007108-000041	Jan 2013	01/25/13	12325		SC SUP SC Supply Company, LLC	AP V 025626 VE	40.01
007108-000043	Jan 2013	01/25/13	116901		SPAULD F.B. SPAULDING CO.	AP V 025628 VE	448.89
007135-000011	Jan 2013	01/31/13	1510164		CASELL CASELLA WASTE MGT., INC.	AP V 025642 VE	829.97
007152-000004	Feb 2013	02/07/13	226792		HARDWR Whitefield Hardware & Bldg	AP V 025689 VE	1.50
007152-000005	Feb 2013	02/07/13	226430		HARDWR Whitefield Hardware & Bldg	AP V 025690 VE	74.85
007152-000006	Feb 2013	02/07/13	226429		HARDWR Whitefield Hardware & Bldg	AP V 025691 VE	58.14
007152-000007	Feb 2013	02/07/13	226610		HARDWR Whitefield Hardware & Bldg	AP V 025692 VE	16.45
007152-000008	Feb 2013	02/07/13	226661		HARDWR Whitefield Hardware & Bldg	AP M 025693 VE	(13.16)
007152-000009	Feb 2013	02/07/13	226642		HARDWR Whitefield Hardware & Bldg	AP V 025694 VE	5.26
007152-000010	Feb 2013	02/07/13	226678		HARDWR Whitefield Hardware & Bldg	AP V 025695 VE	3.79
007152-000011	Feb 2013	02/07/13	226572		HARDWR Whitefield Hardware & Bldg	AP V 025696 VE	3.49
007169-000006	Feb 2013	02/14/13	Office Supply Reimbursement		BILL	AP V 025745 VE	12.49
007181-000007	Feb 2013	02/22/13	1514700		CASELL CASELLA WASTE MGT., INC.	AP V 025766 VE	113.98
007181-000008	Feb 2013	02/22/13	Office Supplies Reimbursement		BILL	AP V 025767 VE	56.99
007192-000004	Feb 2013	02/28/13	1325303001		STCAT Staples Credit Plan	AP V 025818 VE	155.65
007192-000019	Feb 2013	02/28/13	29508		NE REC NORTHEAST RESOURCE RECOVER	AP V 025826 VE	359.03

Results & Conclusions – Outputs

Form #6 - Summary	Total Solid Waste Costs (\$)	Costs by Waste Path			
		Landfilling	Waste-to- Energy	Recycling	Composting
		\$	\$	\$	\$
1 Total Costs	\$ 438,617	\$ 253,367	\$ -	\$ 180,066	\$ 5,185
2 Revenues	114,385	37,996	-	88,070	-
3 Net Costs (line 1- line 2)	324,232	215,371	-	91,996	5,185
4 Tons Processed	1,628	968	-	625	35
5 Net Cost, \$/Ton	\$ 199.21	\$ 222.49	\$ -	\$ 147.29	\$ 148.13
6 Household Units Served	2,047	2,047	2,047	2,047	2,047
7 Net Cost Per Household, \$	\$ 158.39	\$ 105.21	\$ -	\$ 44.94	\$ 2.53

Results & Conclusions – Charts



Sample FCA Results

Costs	Total	Landfill Path	Waste to Energy	Recycling Path	Composting Path
Labor	\$ 54,229	\$ 22,776	\$ -	\$ 30,910	\$ 542
O&M	66,686	26,415		40,161	110
Disposal	43,714	43,714		-	
Debt Service	44,687	18,769		25,472	447
Indirect Costs (Admin)	11,424	4,820	-	6,471	132
Depreciation	14,513	4,125	-	10,219	97
Amortized Costs	13,367	3,458	-	9,893	16
Total Costs	\$ 248,621	\$ 124,078	-	\$ 123,453	\$ 1,090
Revenues (subtract)	63,964	26,130	-	34,834	-
Net Costs	\$ 184,657	97,948	-	85,619	1,090
Tons Received (divide)	685	307	-	375	3
Net Cost Per Ton	\$ 269.65	\$ 319.15	\$ -	\$ 228.39	\$ 363.30

Contributing Factors

This?...

Curbside pickup



... Or this?

Transfer Station Drop-Off



Contributing Factors

This?...



... Or this?

Source Separated
Recycling



Contributing Factors

COMPARISON OF MSW PROGRAM FEATURES

Town	Transfer Station	Curbside Pickup	Pay As You Throw (PAYT)	Active Town Landfill	Permits Required \$	Mandatory Recycling	Bulky Waste Fees
Town A	X				X	X	X
Town B	X		X	X			X
Town C		X			X	X	
Town D	X	X					
Town E	X		X				
Town F	X					X	X
Town G	X		X				X

Sample FCA Results

COMPARISON OF SOLID WASTE COSTS (FCA – net revenue)

Town	Population	Annual Tonnage	Net Cost per Ton for MSW Paths				Factor Sample Curbside
			Recycling	Composting*	Waste to Energy (WtE)	Landfilling	
Town A	5,114	2,351	\$70.95	\$87.70		\$104.19	
Town B	1,671	159	\$144.03	-	-	\$80.13	
Town C							X
Town D							X
Town E	5,828	1,807	\$61.93	\$207.90	-	\$123.88	
Town F	6,990	1,628	\$147.29	\$148.13	-	\$222.49	
Town G	904	749	\$53.85	-	-	\$39.79	
Average Costs			\$95.61	\$88.74	n/a	\$114.10	

*Leaf and yard waste

Summary

Full Cost Accounting

Useful for short- and long-term investment planning

- Equipment, facility improvements, shifting waste handling practices, etc.

Evidence to justify changes in waste handling practices to avoid costs

- Town officials and residents

Takes time & consideration – *as it should!*

- Requires cooperation from all of those involved

Remember, each Municipality or SW District is different

- Make decisions revolving around YOUR town
- Follow the numbers

Beyond FCA...

- Review composition of your town's waste stream.
- Identify opportunities to avoid costs and divert wastes.

Resources

- NHDES FCA Worksheet – www.des.nh.gov/resource-center/publications?keys=Full+Cost+Accounting&purpose=&subcategory=Solid+Waste
- 2022 NH Solid Waste Plan – www.des.nh.gov/sites/g/files/ehbemt341/files/documents/r-wmd-22-03.pdf
- U.S EPA – <https://archive.epa.gov/wastes/conserve/tools/fca/web/html/whatis.html>
- Florida Dept. of Environmental Protection – www.dep.state.fl.us/waste/categories/fca
- Northeast Recycling Council (NERC) – www.nerc.org
- Northeast Resource Recovery Association (NRRRA) – www.nrrarecycles.org



(vertical baler)
Town of Northfield Transfer Station

QUESTIONS?

Tara Mae Albert

*Solid Waste Operator Training & Certification
Coordinator*

tara.m.albert@des.nh.gov

(603) 271-3713

Paige Wilson

Waste Reduction & Diversion Planner

paige.a.wilson@des.nh.gov

(603) 271-0964