

Curbside Collection Cost



Introductions

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Objectives and General Considerations

- Objectives:
 - Discover available information
 - Review existing data & identify gaps
 - Explore work arounds for missing data
 - Invent solutions and develop a common approach
- We don't have the answers
- Group will work together to analyze information in a common way

Sources of Data

- Municipal:
 - Local Reports (Scalehouse, Tracking Data)
 - Financial Statements (General Ledgers);
 - WDO Datacall;
 - Activity: Collection Costs by Municipal Grouping
 - Activity: Recycling Trucks Data Review and Discussion
 - Estimates – more later



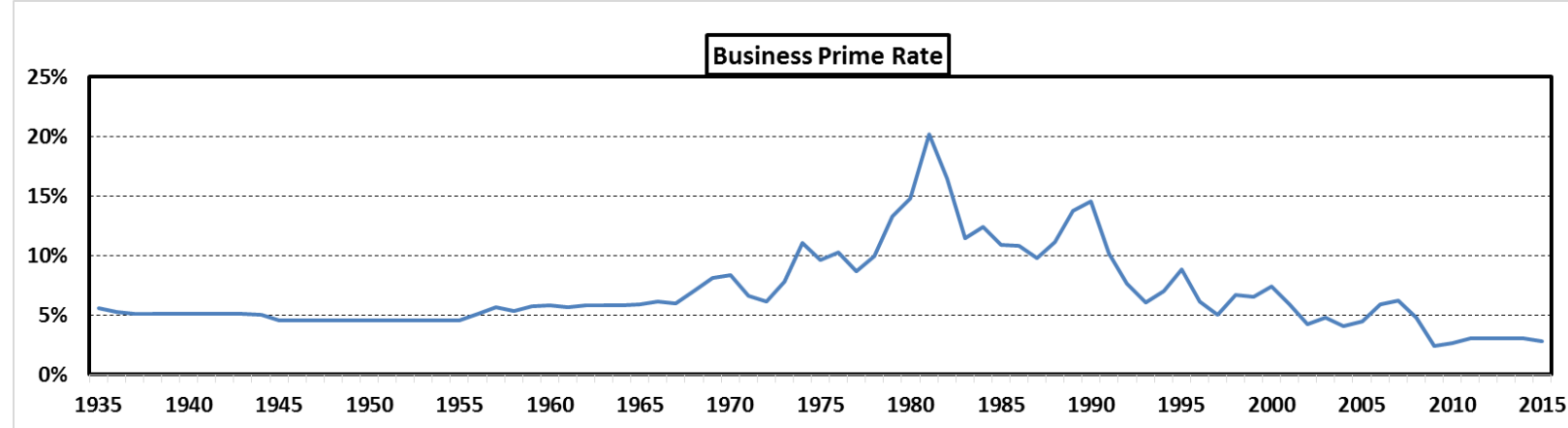
Basic Economic Considerations

(As Used in Blue Box Calculations)

Questions we need to ask

- What do we want to know?
 1. How much will this cost me in the future?
 2. What happens if one component changes?
 3. What conditions should I apply to my offer?
 4. Other?
- Let's keep this focus – make notes on the parking lot as we proceed.

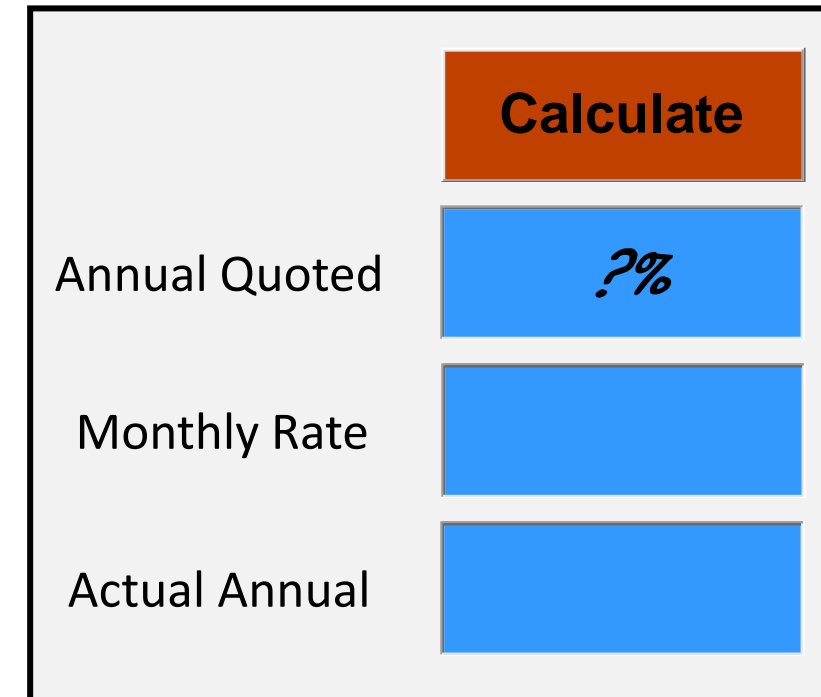
Prime Rate



- Definition
- Canadian Business “Prime Rate” generally refers to the interest rate charged to large corporations with excellent credit ratings. (see: <http://www.bankofcanada.ca/rates/daily-digest/>)
- Court of Justice Act uses the term, “bank rate” mean[ing] the bank rate established by the Bank of Canada as the minimum rate at which the Bank of Canada makes short-term advances to banks listed in Schedule I to the Bank Act”
- Currently 2.70% annually.

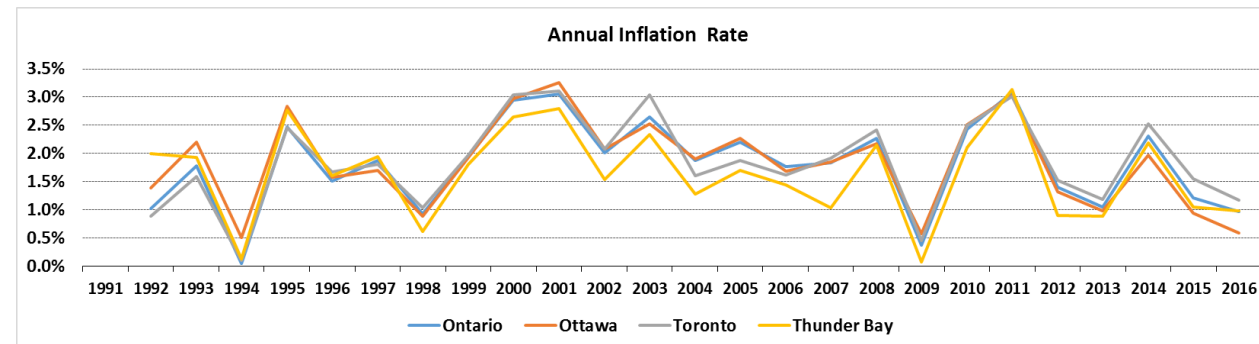
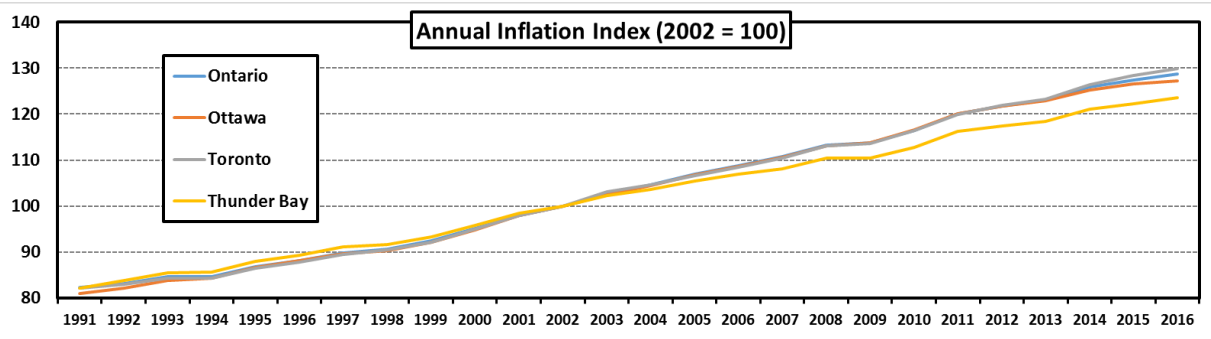
Why would we pay more interest?

- Municipal Credit Rating that reflects:
 - Size of total municipal debt
 - Local economic factors (examples?)
 - Long & short term economic outlook
 - Payment history
 - Bank Policy (usually somewhat negotiable)
- Conversion of Annual Rate based on Monthly payments



CPI and Inflation

- CPI (Consumer Price Index) ≠ Inflation
- CPI refers to various “consumer price indices” [demonstrate]
- “Inflation” - [Bank of Canada website](#) based on [CANSIM 326-0020](#)
 - All items only – may not apply to your analysis
 - Bank of Canada uses special ‘non volatile’ list called “CPIX”



CANSIM Tables of Interest ... or not

- You can also calculate inflation for other factors:
 - [Table 281-0030](#) & [Table 282-0072](#) - Salaries
 - [Table 329-0063](#) (old) & [Table 329-0075](#) – Industrial Product Index
 - [Table 327-0043](#) - Price indexes of non-residential building construction
- Since 2010 quality of Industrial tables has declined
- **Exercise 1 – Comparing Prices of Purchases** made at different times
 - Step 1 – open table [CANSIM 326-0020](#) and extract data (I did this for you)
 - Step 2 – make ‘inflation’ tables for each year
 - Q. how do you handle 2016 with only partial data?
 - Step 3 – make reverse inflation table with 2016 = 100%
 - Step 4 – adjust prices to 2016 equivalent

Exercise #1 Tips

- Cost per truck = Total Reported Cost \div Number of Vehicles
but... that's in that year – you need to inflate the value
- Current Cost = Cost per truck \div Factor from “*Backward Looking Increase*” table for year of purchase
EXCEL: = INDEX(factor column,match(year, year column,0))
- What other factors complicate this concept?

Economic Stuff

- Historic tables give you a good rear-view mirror look
** We need to look forward **
- We can do this with some (better?) certainty if we assume a constant relationship between investment rate and inflation
 - Present Value or 'Net Present Value' (NPV) of future investment
 - Future Value of purchased asset (non-depreciating)
 - Amortization Cost
 - Capital payment
 - Interest payment [graph for \$100,000 loan at various percentages]
- can develop annualized costs for one-time purchases & future commitments

More Economic Stuff

- We can spread costs out over several years, turning ‘point in time’ capital costs into annual costs
 - Amortization Cost (EXCEL function “PMT”)
 - Capital amount – either present cost or future cost
 - Interest rate per period (typically use Prime + 1% - check with Finance Dept.)
 - Number of payment periods (don’t forget to adjust interest if compounded monthly)
 - Typical periods: annually (normal for business calculations); monthly; bi-weekly; daily
 - Function yields a negative value – an accounting thing, so put a “-” in front of it
 - Use future cost if you plan asset purchase after the beginning of contract
 - e.g. buying an additional truck at year 3 of a 7 year contract
 - **In-Class Exercise #2** – calculate payments for a truck

Exercise # 2 Tips

- Calculation of Monthly Interest

$$\text{monthly int.} = \left(1 + \frac{\text{Annual Int.}}{2}\right)^{1/6} - 1$$

- Payment = -PMT(Monthly Int., Term*12, Principal)
 - EXCEL outputs a negative value to indicate a “cost” vs. a “revenue”
 - By Hand – **do only annual**: Payment = A/P × Principal
- Interest Payment = previous period’s balance × monthly interest
- Principal Payment = Payment – Interest Payment

Q. EXCEL - Do total payments exceed Principal? Why? Fix?

Q. Which method has lower interest payments – monthly or annually?

Staffing Costs

- Municipalities tend to have overly generous charge out rates (i.e. too cheap)
- To pay for a worker, we need to consider:
 1. Annual salary;
 2. Benefits package cost (including insurance);
 3. Sick days, training days, vacation & stat. holidays;
 4. Facility costs – share of common facilities (e.g. office);
 5. Supporting staff costs (payroll, janitorial, HR, management);
 6. Other?

Staffing Costs - Example

- Sources: Payroll Information; CANSIM [Table 281-0030](#) & [281-0029](#)

Component	Calculation	Amount
Driver Salary	$\$25.11 \times 8 \times 52 \times 5$	\$52,229
OMERS	Under YMPE = Salary \times 9.00% Over YMPE = \$4941 + (Salary-YMPE) \times 15.8%	\$4,701
Insurance & EI	$\$1000 + \995.04×1.4	\$2,393
Subtotal – Salary & Benefits		\$59,323
Admin Support	Add 25%	\$14,831
Office & Utilities	Minimal – truck charged separately	0
Adjust for non-paid days	$= (52 \times 5) \div ((52 \times 5) - 11 - 6 - 2 - 15) = 1.15$	\$8,898
Total		\$83,052 (\$39.93/hr)

Why estimate collection cost?

- Why not use current contract cost?
- Frequently municipal contract cover all wastes or reflect consideration for other services;
- Important to calculate Blue Box costs as a single business unit for informed negotiation with stewards;
- We may end up with multiple steward clients or 'cherry picking' of Blue Box services
 - e.g. return to retail for aluminum cans & OCC leaving us to pick up the rest
- We may get requests for quality incentives on collected materials & need to know the cost of improving quality curbside.

Transportation & Collection Truck Costs

- **Inputs:**

- Material Data & Compaction
- Truck Amortization
- Truck Operating Costs
- Staff Salaries
- Households
- Fuel Prices (or Fuel Surcharge agreements)

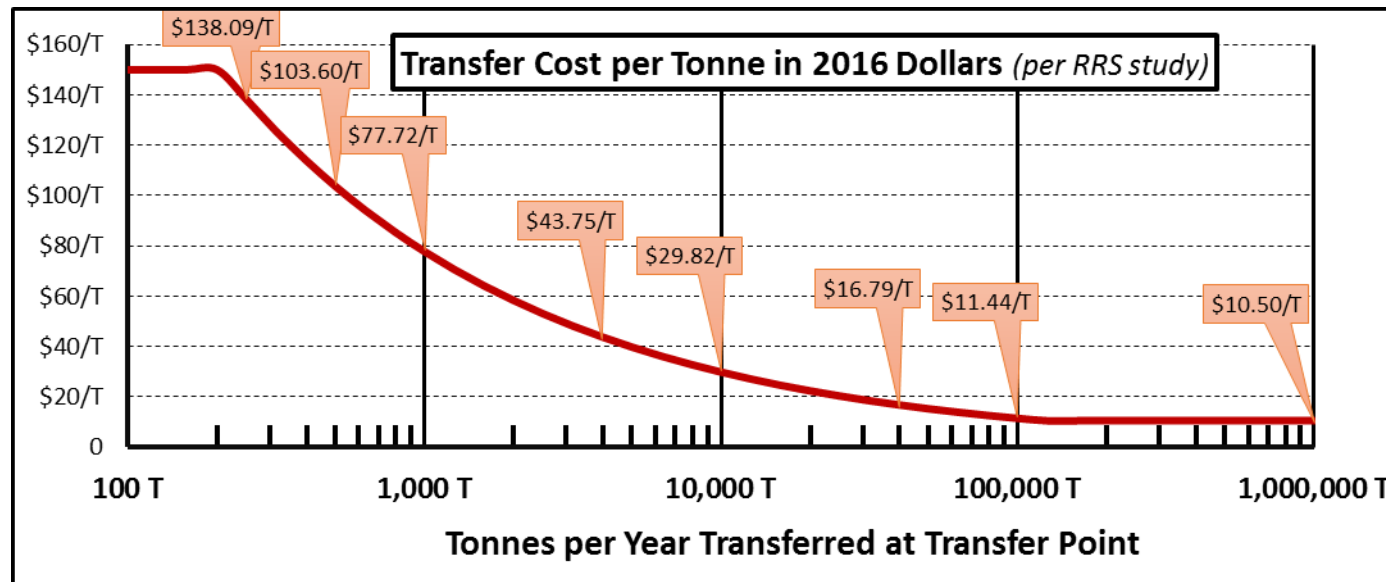
Material Data & Composition

- SO densities reflects “normal” compaction
- Typically 60 kg/yd³ as uncompacted density

(source SO 2016 PIM)	% Tonnes	% Volume	Density	
Printed Paper	48.0%	23.2%	163.16 kg/m ³	125 kg/yd ³
Fibre Packaging	27.0%	38.3%	53.17 kg/m ³	41 kg/yd ³
Plastics (incl. #3 - #7)	10.1%	30.4%	26.78 kg/m ³	20 kg/yd ³
Plastics (no #3 - #7)	6.1%	18.3%	28.38 kg/m ³	22 kg/yd ³
Plastics (incl. #3 - #7 - no EPS)	9.9%	29.7%	27.03 kg/m ³	21 kg/yd ³
Steel Packaging	3.5%	3.2%	82.52 kg/m ³	63 kg/yd ³
Aluminum Packaging	1.2%	2.6%	35.46 kg/m ³	27 kg/yd ³
Glass	10.2%	2.4%	316.42 kg/m ³	242 kg/yd ³
Overall Density			130.93 kg/m³	100 kg/yd³
Fibre Stream (PP, OCC & OBB)	73.6%	58.3%	125.31 kg/m ³	96 kg/yd ³
Container Stream	26.4%	41.7%	146.57 kg/m ³	112 kg/yd ³

Transfer Costs

- Pay to drop material at Transfer Station & shipping costs
- Transfer Cost varies from \$100/T + for small tonnages to ~\$11/T for large tonnages (*source RRS study – 2011 & 2012*)



Transport Costs

- Transport Cost includes:
 1. Per day or per kilometre truck payment;
 2. Per hour driver salary;
 3. Allowance for waiting time – loading & unloading
 4. Premium for part time usage

Transport Costs...

<u>Transport Cost Analysis</u>		180,000 km/yr			
			3.70%		
Item	Full Cost or Factor	Annualized Cost	Item	Full Cost or Factor	Annualized Cost
Truck Cost			Tonnes Transported		
Trailer Cost			Truck Capacity		
Subtotal Truck & Trailer			Required Trips		
Truck Maintenance			One Way Travel Distance		
Trailer Maintenance			Travel Time		
Insurance & Permits			Wait & Loading Time		
Driver Burdened Salary			Required Trucks		
Total Annual Cost					
Fuel Cost per Litre					
Truck Cost per hour (idle)					
Truck Cost per kilometre			Kilometre based costs		
Fuel Cost per kilometer			Truck Costs		
Tires (1 set/200,000 km)			Transport Cost per Tonne		

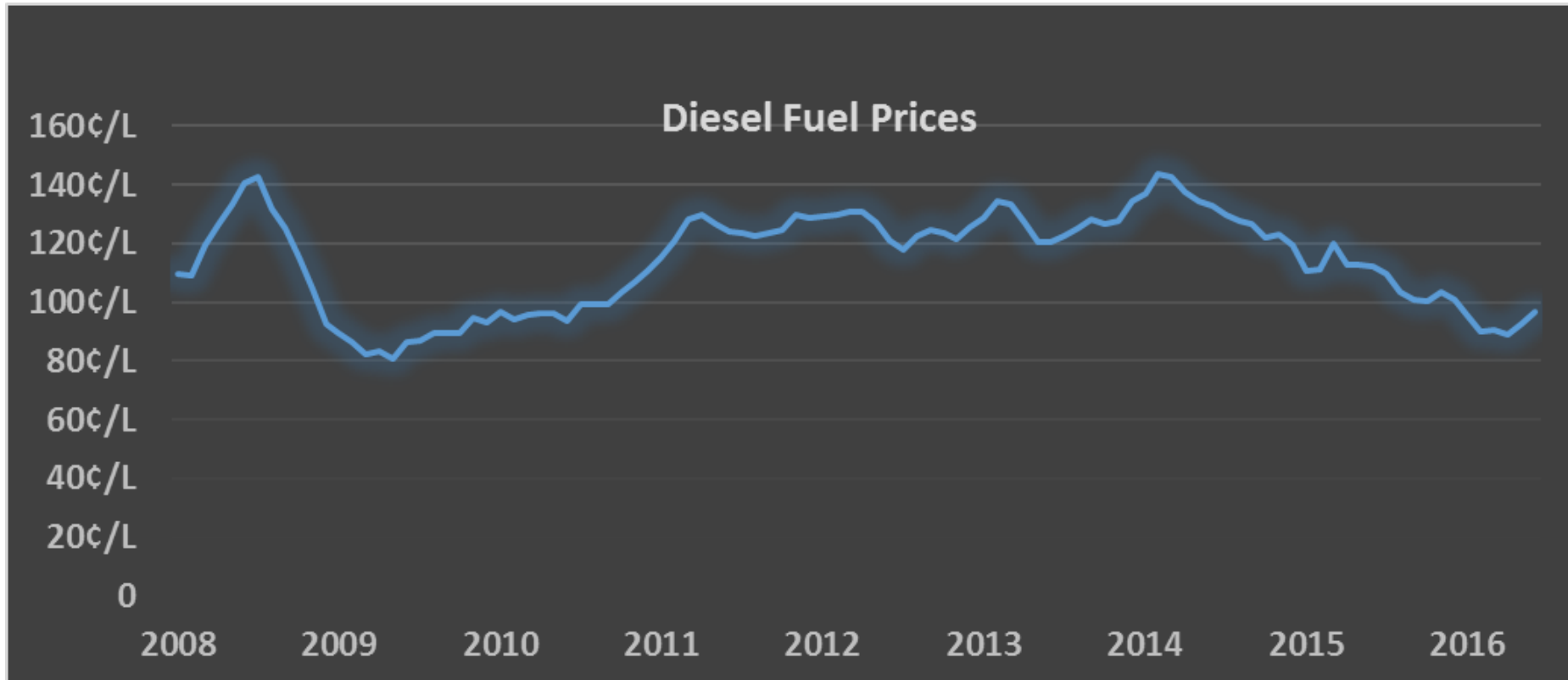
Required Collection Vehicles

- Collection Inputs:
 1. Total households;
 - a. urban households
 - b. rural households
 - c. seasonal households
 2. Time per stop
 3. Time / Distance to TS or MRF
 4. Truck cost analysis

In-Class Exercise #3 – Collection Truck Requirements

Energy and Fuel Costs

- Best source for Historic Fuel Costs is [Ministry of Energy](#) website



Stuff gets old – depreciation & salvage value

- **Depreciation Estimation**
- EXCEL has several methods of estimating depreciation, including:
 - SLN – straight line depreciation – used by WDO – equal devaluation each year
 - SYD – single year depreciation – depreciation in a given year is the age of the asset ÷ sum of years of its life (see table “Depreciation”)
 - DB – declining balance method uses a fixed rate – quicker initial depreciation (e.g. high tech electronics)
- **Salvage Value**
- Some stuff never reaches 0 value because of material salvage
- Real estate generally has an appreciating property value and depreciating building value

Stuff gets complicated – economic timeline

- In reality – not all assets have the same amortization, or interest rates
 - Time variability of interest rates
 - Higher interest rates reflecting longer term economic uncertainty
 - Risk Assessment – if it seems positive for the future, I may speculate and give you a better rate
- Assets may have different life times or terms
 - WDO has terms from 5 years for small items; to 7 – 10 years for rolling stock & bins; to 20 years for buildings
- Solution – do parallel assessments using timelines, possibly with different start and end dates
- Smaller assets may ‘cycle’ several times during term of larger assets

Residual Value of Contract Calculation

- We may have to consider buying out contracts
- Contractor will attempt to claim straight put or pay costs for balance of contract term
 - Negotiate now to avoid this – make sure you have buy out clauses
 - Contractor losses really limited to put or pay value – operating costs
- Demobilization Costs
 - Labour – limited to layoff costs – typically 1 mo. salary per year of tenure
 - Equipment resale – contingency sellers charge 30% of depreciated value
 - Specialized equipment may not sell

Post Class Assignment

- Apply these principals to estimate cost of Collection Contract for purposes of negotiation
- Recall that your current costs may represent:
 - Older technology & practices;
 - Single stream collection – will produces ask for multi-stream collection
 - Trade-offs with garbage, organics and other municipal expenses
 - Political Decisions affecting contract costs

Worksheet Review – Example Municipality

- Review of Municipal System
- Trucks
- Infrastructure (offices, yard, etc.)
- Staff – Contract, Municipal
- Other Costs
- Missing?



Example Assignment

- Demonstrate contract cost assessment.
- You can easily complete this exercise this afternoon – with or without our assistance (we will make ourselves available)
- You can also ask us questions by e-mail:
laurie@westaway.ca or alecscott53@gmail.com
- If you don't have numbers for your municipality, let us know and we will generate some for you.
- [Class Assignment](#) – due June 26, 2016 at 4:00 PM

Working with Your Curbside Collection Costs



The End

