Dawn Tremblay

Watching Our Waste-line:
Used Electronics, Tires and Organics
The Gordon Foundation undertakes research, leadership development and public dialogue so that public policies in Canada reflect a commitment to collaborative stewardship of our freshwater resources and to a people-driven, equitable and evolving North. Our mission is to promote innovative public policies for the North and in fresh water management based on our values of independent thought, protecting the environment, and full participation of indigenous people in the decisions that affect their well-being. Over the past quarter century The Gordon Foundation has invested over $37 million in a wide variety of northern community initiatives and freshwater protection initiatives.

The Jane Glassco Northern Fellowship is a policy and leadership development program that recognizes leadership potential among young northern Canadians who want to address the emerging policy challenges facing the North. The two year long program is built around four regional gatherings and offers skills training, mentorship and networking opportunities. Through self-directed learning, group work and the collective sharing of knowledge, Fellows will foster a deeper understanding of important contemporary northern issues, and develop the skills and confidence to better articulate and share their ideas and policy research publicly. The Fellowship is intended for young northerners between 25 and 35 years of age, who want to build a strong North that benefits all northerners. Through the Fellowship, we hope to foster a bond among the Fellows that will endure throughout their professional lives and support a pan-northern network.
Dawn Tremblay

Dawn Tremblay was born in Fort Simpson and raised in Yellowknife, Northwest Territories (NWT). After high school, she went south to university. She returned home with a political science degree, and an appetite for more northern knowledge. So Dawn sought out opportunities and completed a certificate in circumpolar studies with the University of the Arctic through Aurora College, followed by a semester at the Dechinta Bush University. Dawn is currently working for Ecology North, an environmental non-profit organization with charity status. Her Fellowship research is about sustainable waste management, with a focus on a tire stewardship program for the NWT and the organics recycling program in Yellowknife. In her spare time, Dawn likes to get outside with her son and her dog.
People produce many different kinds of waste. While researching waste management in the Northwest Territories (NWT), I focused on three main components of the waste stream: electronics, old tires, and food waste (organics). These three components represent a cross-section of commonly consumed and discarded items. Waste is generally managed at the local level; however, there are territorial and federal programs and responsibilities for waste management. The figures below illustrate two waste management theories. Figure 1 illustrates the waste management hierarchy and ranks options from most sustainable to least sustainable. While Figure 2 illustrates a closed-loop cycle of waste management, which produces zero waste. The following document includes an update on the nascent electronics recycling program, and more detailed policy memos for old tires and organics recycling. The tire waste policy option is written for the Government of the Northwest Territories (GNWT), since it addresses the Territory-wide problem of used tire accumulation and the need for territorial programming. Whereas the organics waste-recycling policy memo is written for the City of Yellowknife, since it focuses on the problem of increasing participation in organics recycling beyond the residential curbside collection. How are used electronics, tires and organics impacting our waste-line?
The Waste Management Hierarchy

A waste management theory ranking options from most sustainable to least sustainable.

REDUCE
Minimize the amount of waste produced

REUSE
Use materials more than once

RECYCLE/COMPOST
Use materials to make new products

RECOVER
Recover energy and metals from waste

DISPOSAL
Safe disposal of waste to landfill

The Circular Economy

A waste management theory illustrating a closed-loop cycle of waste management, which produces zero waste.

Electronic Waste Management

Policy Options for the Government of Northwest Territories
The Government of the Northwest Territories (GNWT) launched a territory-wide electronics recycling program on February 1, 2016, following a pilot project in four communities starting in 2013. The program introduced an environmental handling fee on new electronics purchased in the NWT. Retailers collect the fees and submit them to Government of the Northwest Territories to cover the costs of recycling.

A similar program exists in neighbouring jurisdictions such as Alberta. In the NWT, recycling depots originally established to accept beverage containers now accept selected electronics. However, unlike beverage containers, residents do not collect a refund when they drop off old electronics. A year into this program, it is premature to analyze and provide recommendations for improvements. Nevertheless, an evaluation of the electronics recycling program in the near future enhances the likelihood of an optimally effective policy and program. In theory, electronics recycling decreases our waste-line by providing infrastructure and funding to responsibly management electronic waste.
Tire Waste Management

Policy Options for the Government of Northwest Territories
PROBLEM DEFINITION

Tires are commonly brought into and used throughout the Northwest Territories, and they end up at our solid waste facilities or dumped on the land at their end of life. Sometimes they go directly into the landfill and sometimes they are piled in a separate area. Tires are flammable and piles of tires are a breeding ground for mosquitoes when water pools in them. If they burn, the resulting toxins reduce air quality and can cause health and safety problems. Currently, no funding exists specifically for communities to deal with used tires, limited options exist for reusing tires, and large freighting distances to southern markets are costly for recycling. Thus, tires steadily accumulate and present an ever-greater risk of burning. We don’t know the proportion of tires tossed into the environment versus disposed of at solid waste facilities in the NWT. These challenges can be overcome with a sufficient budget, but securing funding is problematic once tires reach the end of their usable life. The problem is consistently generating the funding required to deal with used tires in a financially, environmentally and socially responsible way.
Tires come from a variety of transportation uses, including residential, commercial, industrial and essential services. Currently, some communities in the NWT such as Yellowknife and Fort Smith have a disposal fee for old tires. However, many NWT tire users do not pay anything at time of purchase or disposal of their tires. In Yellowknife, businesses may charge an extra fee on tires, to cover the costs of taking them to the Solid Waste Facility; as a result, some consumers discard old tires into the environment to avoid the fee. Most communities have no specific source of revenue to manage old tires.

Government has the responsibility to ensure a safe environment for people. This has come to include dealing with toxins that result from the disposal of products such as tires. Governments realize a systems approach is required, and producers or retailers must be regulated to ensure accountability for the safe end-of-life disposal of the products they produce or sell. Therefore, producers of tires have a responsibility for the huge piles of tires in our communities. They make the tire and should make use of the old rubber. Producers could (or should) play a role in the end of life-cycle of their products. While producers should take this responsibility, they are not located within the NWT and thus are not regulated by NWT authorities, which makes it difficult to address the issues faced in the NWT. However, many tires disposed of in the NWT are purchased here, and therefore an opportunity exists to address responsibility through tire retailers.

Local policymakers have the most jurisdiction over diversion programs like tire recycling. However, they often have insufficient resources or capacity to take this on. Territorial policymakers have jurisdiction stemming from the Waste Reduction and Recovery Act, which can be exercised through territory-wide diversion programs. Aboriginal governments in the NWT have varying degrees of jurisdiction over waste management based on land claims and self-government agreements, but at this time have not indicated interest in taking on an active role. The federal government has jurisdiction over air pollution, GHG emissions, and Hazardous Waste, so they have some responsibility to support initiatives which contribute to clean air, decreased GHG emissions and hazardous waste management.

The Northwest Territories and Nunavut are the only jurisdictions in Canada without a tire stewardship program. The specifics vary in each province and territory, but all

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3 This concept is referred to as Extended Producer Responsibility (EPR).
5 An example of a GNWT diversion program is the Beverage Container program. It is a stewardship program. People pay a fee when purchasing a beverage, a portion of which is returned when the beverage container is dropped off at a depot or collection event. The remainder goes into the GNWT’s Environment Fund which covers recycling and operation expenses.
6 In the NWT, self-government agreements include clauses pertaining to waste. For example, according to the Délı̨nę Self-Government Agreement, “Despite subsection 72.03(1) or any territorial law, the Gwich’in and Sahtu First Nations, the Tlicho Government and the Délı̨nę Got’ine Government are not required to pay any fee in respect of the use of waters or the deposit of waste for non-commercial purposes on their first nation lands, Tlicho lands or Délı̨nę lands as the case may be.” This is substantially different than in southern jurisdictions, where user pay systems are in place for dropping waste off at solid waste facilities.
programs have people paying a fee on the purchase of new tires and disposing of them free of charge, which also prevents the practice of discarding the tires into the environment to avoid a fee. The fee at tire purchase is meant to cover the costs of recycling tires. A range of fees exists for different sized tires. Fees vary from $3 to $7 for passenger vehicles and light truck tires. Ontario adjusts the fee annually based on the actual numbers of tires sold into the market. Some provinces limit the number of tires you can return at one time (generally four or five, with the highest limit of 10 in Saskatchewan). A few programs include bicycle tires for free. Saskatchewan is running a program to encourage tires from farm land and properties to be returned free of charge, thus cleaning up historic tire accumulation. Management of the programs vary between each jurisdiction. Non-profit associations, arm’s length Crown corporations or governments run the programs.

Challenges for an NWT stewardship program include limited financial and human resource capacity at the community level, and an initial stockpile of tires. Transportation to southern markets for recycling is a major challenge.

“TIRE WASTE MANAGEMENT

The problem is consistently generating the funding required to deal with used tires in a financially, environmentally and socially responsible way.”
POLICY OPTIONS

1. Stay the Same
   
   Allow tires to accumulate in communities.

2. Tire Stewardship Program
   
   Implementing a tire stewardship program would require NWT consumers to pay a fee on the purchase of new tires to fund the end-of-life tire recycling costs, similar to the electronics recycling program.

3. Standardize Nationwide
   
   A nationwide program in which the Government of Canada or each jurisdiction implements a nationally coordinated Extended Producer Responsibility (EPR) program, ensuring producers pay a recycling fee to cover the end-of-life costs of tires.
Stay the Same

**ADVANTAGES**
- Low cost politically and financially
- Low effort

**DISADVANTAGES**
- No source of funding to deal with tires
- Continue to increase hazard (fire and health potential and mosquito breeding ground)
- Original problem gets worse

Tire Stewardship Program

**ADVANTAGES**
- Generates revenue to deal with old tires
- The existing Beverage Container program systems (depots, legislation, infrastructure) provide a ready platform for implementation
- Communities receive financial support to participate in tire recycling program
- Decreases hazards (fire, health and safety)

**DISADVANTAGES**
- No role for Extended Producer Responsibility
- People resist change, and don’t want to pay more
- Retailers may resist since it adds to their workload
- Funding may be short of what is required because some tires are purchased outside the jurisdiction but disposed of here
Standardize Nationwide

ADVANTAGES

▶ Requires that producers play a role in end of life-cycle costs
▶ Decreases hazards permanently and comprehensively by being nationally coordinated
▶ Standardized throughout the country
▶ Covers the recycling costs for all tires

DISADVANTAGES

▶ May initially be costly to achieve
▶ Interjurisdictional negotiations can be time-consuming, politically challenging and difficult to complete
▶ Producers may be reluctant to take on responsibility, and slow down negotiations or implementation
At this time, the recommended policy option to immediately improve tire waste management is to implement a tire stewardship program. Moving forward, the GNWT should support dialogue toward the establishment of a national Extended Producer Responsibility program. The benefit is generating funds to responsibly and environmentally deal with tires throughout the NWT once they are no longer useful.
IMPLEMENTATION

GOVERNANCE
Minister of Environment

DEPARTMENT
Environment and Natural Resources

AGENCY RESPONSIBLE
Environment Division, Waste Reduction and Management Section

HUMAN RESOURCE IMPLICATIONS
Incremental workload increase related to current depot and program delivery, and substantial work required to establish a new program, comparable to establishing the electronics recycling program.

Timeline

Years 1–3
- Establish and launch program
- Add tire recycling regulations under the Waste Reduction and Recovery Act
- Identify regional challenges, consult and increase capacity at current depots
- Marketing campaign
- Interjurisdictional negotiations for funds collected on vehicles purchased out of territory for example in Alberta and the Yukon

Years 4–5
- Rotate 5-year regional transportation plan (focus on one region per year to ensure tires and accumulated tires get to southern markets when local uses are exhausted)
- Encourage Cabinet to complete EPR negotiations at FPT (Federal/Provincial/Territorial forum)
- Establish a clear annual public collection schedule for communities without depots
- Establish a regular evaluation mechanism to ensure the fees are covering the cost of the program, and a mechanism to adjust them accordingly

Years 6–10
- Tackle transportation challenge of accumulated tires.
- As of program launch date, focus on one region per year
Revenue will depend on the fee rate, and number of tires purchased in the NWT. The Environment Fund will see incremental cost increases to annual operations such as advertising and promotion, depot handling fees, equipment maintenance, freight, insurance, processing-centre handling fees, storage, and wages and benefits. One-time cost expenditures will be experienced to establish a new program, predominantly in the following categories: advertising and promotion, engagement, freight costs associated with regional accumulated tire removal, and purchase of new equipment such as a shredder.

Budget

$87,000 per year over 5 years
Organic Waste Recycling

Policy Options for the City of Yellowknife
PROBLEM DEFINITION

Putting organic material in a landfill takes up valuable and costly space, contributes to the production of toxic landfill leachate and produces methane emissions. So, landfilling organics can pollute the environment. However, when organic material is composted it creates a beneficial soil amendment. Low soil fertility is a problem for food production in parts of the NWT that could be addressed by adding compost, the fertile soil amendment created by collecting and composting organic waste. Composting is an accessible waste-diversion option throughout the NWT. The City of Yellowknife has created a great organics recycling option based on a successful pilot project. The Yellowknife Centralized Compost Program offers curbside organics recycling for single family units,\(^7\) and organics dumpsters to a few businesses (also referred to as the Institutional, Commercial and Industry (ICI) sector).\(^8\) However, this only represents a small portion of the city’s organic waste stream. A much higher proportion of organics need to be diverted to achieve an effective program that reduces health concerns, greenhouse gas emissions and high landfill costs. The ICI sector has a significant impact on the diversion rate. The problem is how to achieve high participation rates from the ICI sector.

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\(^7\) “Single Family Unit means a self-contained residential unit with its own entrance that is not accessed through another dwelling unit, but does not include a multi-family unit premise.” City of Yellowknife. Solid Waste Management By-law No.4376, September 12, 2005.

\(^8\) The business sector includes all waste other than single-family units, therefore it includes multi-family units like apartment buildings and condominiums, institutions such as schools, and businesses such as restaurants and grocery stores.
Waste management is important for human and environmental health. Organics recycling has a positive environmental, health and economic impact. It reduces the amount of organic materials going into the landfill, where saving space saves money – because the “quicker you fill, the larger the bill.”

The cost of building a new landfill cell in Yellowknife is $3.5 million, which does not include closure or operational costs. When food scraps and yard waste (organics) are landfilled, they decompose very slowly because there is not enough oxygen, and they produce methane. Methane is a very potent greenhouse gas (GHG) contributing to climate change. When organics are composted, no methane is produced.

The Yellowknife Centralized Composting Pilot Project ran from 2009 to 2012. It diverted over nine hundred tonnes of organics and proved that turned windrow composting is an effective composting method in the North. Between 20 to 25 restaurants and businesses participated in the project. After the pilot project transitioned into a paid program, many restaurants stopped participating. Starting in 2014, the City of Yellowknife phased in the Yellowknife Centralized Compost Program, or green cart program, over 4 years. The program will service all single-family units by September 2017. A phased approach to implementation has been a successful way of spreading out the capital construction costs while refining public educational tools. The next and final phase of expansion is for the ICI sector.

There are several key players in organics recycling. First, residents generate waste. 40% of household waste is organic. Residents in single-family units pay a $21/month solid waste levy per premise. People’s buying habits, consumption habits and disposal habits affect the volume of organics being generated and sent to landfills. Individual actions cover a wide spectrum when it comes to disposing of organic waste. Residents play a central role in organics recycling because they separate organics at the source. They are also responsible for ensuring that plastics do not end up at the compost facility in Yellowknife.

Second, the ICI sector makes up at least two-thirds of the full waste stream in Yellowknife. Therefore, it plays a large role in the success of an organics recycling program. Local food producers exist in the North, and composting to produce a soil amendment is a standard practice for gardeners and farmers. Currently, the City of Yellowknife has not expanded the organic waste collection program to include the ICI sector, other than the continued participation of some pilot project participants. Presently, the price

“Residents play a central role in organics recycling because they separate organics at the source.”

9 “The cost of landfilling waste has historically been estimated at $150/m³. The City believes that this has dramatically increased with the necessary construction of new landfill cells.” p. 228 https://www.yellowknife.ca/en/city-government/resources/Budget/2016_Budget/Final_Budget_Documents/13a-2016-Capital-Projects.pdf, accessed February 7, 2017.

10 According to the International Panel on Climate Change (IPCC) 2013, methane has a global-warming potential 34 times more potent than carbon dioxide over a 100-year period and 84 times over a 20-year time period https://www.ipcc.ch/report/ar5/wg1/ accessed February 15, 2017.
The difference between mixed waste and organic waste is meant to provide enough incentive for ICI sector participation. The tipping fee for mixed waste is $104/tonne, whereas the tipping fee for organics waste is $33/tonne. That is to say that businesses should save money in the long run if they decrease the frequency of their garbage collection and increase the use of an organics Dumpster.

Some main factors influencing ICI sector participation are cost, space for a Dumpster or fleet of green carts, and incentive. Within the ICI sector, specific challenges exist for multi-family dwellings, restaurants and grocery stores and other institutions or businesses.

Third, local policymakers at the City of Yellowknife have the most jurisdiction over organics recycling. The City pays to manage waste, whether through landfills or diversion programs like recycling. Other governments have varying degrees of jurisdiction and interest in waste management. However, the main responsibility for participation and diversion rates lie with the City of Yellowknife. The City of Yellowknife assumes this responsibility with the solid waste management bylaw and the corresponding solid waste levy, and with solid waste tipping fees charged at the landfill.

Fourth, a solid waste contractor hauls waste in Yellowknife. The company has a contract with the City of Yellowknife to collect waste from single-family units, and has contracts directly with clients in the ICI sector. The current costs of an organics Dumpster for the ICI sector include a $33 tonne rate at the Solid Waste Facility, plus the Dumpster rental and collection costs determined by the contractor (Kavanaugh Brothers). The only direct influence the City has over ICI sector waste is through the tipping fee at the landfill. A strong relationship with the contractor, Kavanaugh Bros., is instrumental in addressing cost and space concerns for the ICI sector.
1 Status Quo
Relying on the hope those in the ICI sector will choose to participate because it’s the right thing to do.

2 Strong Stance
A bylaw that requires participation in a diversion of organics from the landfill.

3 Promote Participation
Increase participation through (1) targeted public education; (2) leading by example (implementing within City facilities and events); (3) clearly outlining a target diversion rate for organics.\footnote{This option would require a penalty and enforcement provision.}
Status Quo

**ADVANTAGES**
- Low cost
- Low effort
- Easy to implement

**DISADVANTAGES**
- Low participation results
- Low community buy-in on program
- Dealing with upset people because they don’t know what’s going on

Strong Stance

**ADVANTAGES**
- Ensures participation
- Shows leadership in northern waste management
- Could be simplest way to achieve diversion targets
- In sync with leading trends internationally
- Provides an opportunity to require compostable disposable dishes at all restaurants and public events

**DISADVANTAGES**
- The cost may be debilitating to the economics of some members of the ICI sector
- Political will to do this is uncertain
- Will require strong and transparent leadership
- May require City assistance to some members of the sector in early stages of implementation
- People don’t like having to pay money if they separate incorrectly, and won’t be happy if the fees on mixed waste increase
Promote Participation

**ADVANTAGES**

- Increases proper participation
- Reduces time spent removing contamination
- Saves money & environment by keeping more organics out of landfill

**DISADVANTAGES**

- People resist change
- Hard to evaluate effectiveness

**Targeted public education**

- Increases awareness of program
- Provides information that is relevant and necessary for easy and proper participation
- Directs efforts to areas with largest potential impact

**Targeted public education**

- Difficult and costly to achieve wide-spread knowledge
- Can get repetitive and some people may tune out the message
- Still voluntary, degree of increase in participation is unknown

**Leading by example**

- Employees learn to compost in the workplace
- Public learns behaviour while at any City facilities
- People can take learning home
- Low cost as City would be doing so anyway, presumably

**Leading by example**

- Unknown impact on rate of participation by targeted audience
- Potential for contamination by people who don’t understand the program
- May be confusing for visitors to Yellowknife

**Clearly outline a target diversion rate for organics**

- Gives residents a clear goal
- Gives people an incentive
- Gives policy makers and employees direction and evaluation tools for programs

**Clearly outline a target diversion rate for organics**

- Could be hard to reach
- If unreached people could get discouraged
- May be costly to measure accurately
I recommend taking a strong stance, and begin the process to amend the solid waste management bylaw to require participation in organics recycling. Changes should be made public, with several years’ advance notice before participation becomes mandatory. All options need an enforcement and evaluation provision. However, since this can be a lengthy process, in the interim, I recommend the City promote participation by doing targeted public education, leading by example, and establishing a target diversion rate.
Timeline

Years 1–3

- Phased implementation
- Start internal process for bylaw update immediately
- Lead by example, and implement program in all City facilities for staff and the public (2017)
- Continue targeted public education (2017, ongoing)
- Expand program to include schools (2017–18 school year)
- Expand program to include multi-family units (take a phased approach starting in 2018)
- Establish a target diversion rate (2018)
- Increase ICI sector participation to include all restaurants and food handling establishments, as a first step to citywide participation (2018–19)
In conclusion, I recommend the GNWT both evaluate the electronics recycling program and implement a tire recycling program. I recommend the City of Yellowknife take a strong stance while updating their Solid Waste Management Bylaw to make organic waste diversion mandatory, and, in the interim, promote participation in organics recycling in the ICI sector. These policy recommendations will improve waste management in the NWT. However, success depends on individual participation in programs. We all have a role to play and decisions to make about how we contribute to waste management. What have you done today? Does it increase or decrease our Waste-line? Is that what we need?

“Success depends on individual participation in programs.”


