Assessing the Waste Management System in the Gros Morne Region

Prepared by: Julia Fracassi

Edited by: Jackie Bauman, Tara Howse, and Rebecca Brushett

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ATLANTIC HEALTHY OCEANS INITIATIVE

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Background

The Mariana Trench is the deepest point in the ocean, with a maximum depth of 10,975 meters (36,000 feet). In 2019, scientists discovered a single-use plastic bag at the very bottom, proving that plastic has permeated every facet of life on earth, from the depths of the Mariana Trench to inside the human body. Plastic not only poses a threat to human health, but to marine and terrestrial ecosystems as well. We are only beginning to understand the true repercussions of our heavy reliance on single-use plastics.

There is no panacea to cure our present-day plastic crisis. The challenge is daunting, but this is a unique opportunity to look at the life cycles of the products we use and how to step away from the linear "take-make-waste models" and move towards a more circular system. This includes looking at our waste management systems to identify where changes can be made from the inception of the product itself to the landfill where it may ultimately end up.

Atlantic Healthy Oceans Initiative

Atlantic Healthy Oceans Initiative (AHOI) is a non-profit organization that is tackling the reduction of single-use plastics and increasing waste diversion from landfills through the improvement of waste management in the Gros Morne Region. AHOI's project titled "Working Together to Create a Circular Economy for the Gros Morne Region" is funded through the Zero Plastic Waste Initiative (Environment and Climate Change Canada) in partnership with TGM Tours, the Gros Morne Cooperating Association, and the Environmental Policy Institute at Memorial University of Newfoundland. AHOI also established a formal partnership agreement with Gros Morne National Park (GMNP) and the Gros Morne Cooperating Association (GMCA), called "Becoming Plastic Waste Free in Gros Morne", to further mobilize waste diversion efforts and to bring the region closer to a circular economy. The efforts and results of these projects have gained media attention and have been cited across social media with the hashtag "#ZeroPlasticWasteGrosMorne". This program has also allowed AHOI to collaborate with organizations, businesses, community members and municipalities in the region to streamline waste management efforts and improve the efficiency of the system.

Figure 1. GMNP, GMCA and AHOI partnership picture in Wild Cove, NL during the spring of 2021. Photo by Greg Knott.

AHOI's regional strategy for tackling plastic waste aims to build upon the joint waste diversion efforts between multiple entities and generate consistency throughout the region where municipalities, local businesses, and the national park can operate and move towards a circular economy. Interviews and public consultations conducted by AHOI have provided instrumental data for mobilizing the "Zero Plastic Waste Gros Morne" initiative. Based on the conversations with community members and the ongoing research into the regional waste management system, AHOI has identified gaps and areas of opportunity to help divert more plastic waste.

The purpose of this report is twofold: to look at the current state of the waste management system in the Gros Morne Region and provide recommendations for increasing waste diversion as a region, and as a province. One of AHOI's goals is to focus on waste diversion in the plastic packaging sector by recommending solutions that can bring key players together, including Gros

Morne National Park, municipalities, local businesses, waste collection services, and regional waste management authorities.

Promoting a Circular Economy

Our current economy is based on the "take-make-waste extractive industrial model", a linear system where raw materials are extracted to make products that are ultimately discarded as waste when they lose their value (Ellen MacArthur Foundation, 2017). In this type of economic framework, value is created almost exclusively from raw materials. The long-term sustainability of this model is impractical on a planet with finite resources—infinite growth on a finite planet holds grave implications.

A circular economy is an alternative economic framework that functions in a closed-loop; products are reused, shared, repaired, refurbished and recycled to extend their life cycle and keep products out of landfills (Ellen MacArthur Foundation, 2017). This is demonstrated in Figure 2 below. It entails a shift away from relying on the consumption of finite resources for economic activity. In a circular economy, value is redefined. There is economic value in re-circulating plastics in the economy, and a linear economy is deficient in capturing that value. In a circular economy, "waste" becomes the raw material that ultimately fuels growth; waste is no longer waste because it has intrinsic value.

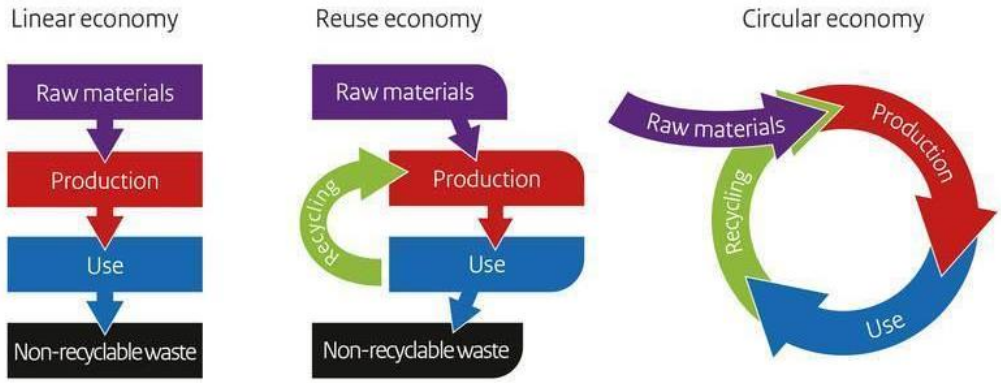


Figure 2. A graph comparing linear, reuse and circular economies (Government of the Netherlands, 2017).

The three principles of a circular economy, as outlined by the Ellen MacArthur Foundation:

- Design out waste and pollution
- Keep products and materials in use
- Regenerate natural systems

Recycling in the Gros Morne Region

Located in Western Newfoundland, this region boasts the Gros Morne National Park – a UNESCO World Heritage site, seven municipalities and a rich collection of flora and fauna. The population is roughly 3500 however, the region receives a large influx of approximately 250,000 visitors each year, throughout the tourism season. Recycling in Western Newfoundland is relatively new; Western Regional Waste Management (WRWM) implemented the first mandatory waste separation program for the region, "Sort-It Western" in 2018. WRWM is a not-for-profit organization governed by the Western Regional Service Board, which was created by the Ministry of Municipal and Provincial Affairs to work with the region to implement the Waste Management Strategy first introduced by the province in 1999. With the presence of the national park, several local businesses, and municipalities in the Gros Morne Region, achieving waste diversion targets requires a resilient recycling program.

Federal and Provincial Commitments

Under Canada's G7 presidency in 2018, the Ocean Plastics Charter was championed for its objectives to move toward a more sustainable approach to producing, using and managing plastics, including transitioning to 100% reusable, recyclable or recoverable plastics and increasing recycled content by at least 50% in plastic products by 2030. Later in 2018, the Canadian Council of Ministers of the Environment (CCME), representing the federal, provincial and territorial governments, presented the Strategy on Zero Plastic Waste, which lays out a path to achieving a circular economy for plastics in Canada and contributes to reaching the ambitious targets laid out in the Ocean Plastics Charter. In 2019, the CCME approved Phase 1 of the Zero Plastic Waste Action Plan to support the Strategy and focus actions along the life-cycle of plastics to increase their recovery in the economy: product design, single-use plastics, collections systems, recycling capacity and domestic markets for recycled

material. Phase 2 of the Action Plan was launched in 2020 and targets actions to reduce plastic pollution and serve as enablers to achieve the goal of zero plastic waste by 2030.

At a statutory level, in April 2021, the *Canadian Environmental Protection Act, 1999* was amended to include "plastic manufactured items" as a toxic substance under Schedule 1. This amendment has allowed the federal government to better regulate plastics in Canada. In December 2021, the Government of Canada announced a proposal to introduce *Single-Use Plastics Prohibition Regulations* that would eliminate or restrict six categories of single-use plastics in Canada, including checkout bags, straws, stir sticks, six-pack rings, plastic cutlery, and difficult-to-recycle food takeout containers such as those containing polystyrene or black pigments, many of which pose a serious threat to wildlife, ecosystems, and coastal areas. In February 2022, the Government of Canada also published a notice of intent and a technical issues paper on the development of proposed regulations for minimum recycled content for certain plastic manufactured items.

Similarly, the Government of Newfoundland and Labrador announced a ban on the distribution of retail plastic bags, effective October 1, 2020, as part of a growing effort to reduce the reliance on single-use plastics by residents, businesses, governments, and organizations.

These efforts reflect Canadians' desire to see more aggressive government action to mitigate plastic pollution, with 95% of those surveyed in a poll by Oceana Canada saying they were concerned about the impacts of plastic pollution on oceans and marine life. Many feel these efforts are a good start but are simply not enough. Oceana Canada notes that only 9% of plastic waste is effectively recycled in Canada. The path to increasing that number is fraught with challenges, but none that can't be overcome.

Looking at the System Holistically with FRAM

The Functional Resonance Analysis Method (FRAM) is a method for modelling socio-technical systems (in this case, the waste management system). Developed in 2004 by Erik Hollnagel, FRAM enables researchers to create a holistic map of an organization that allows them to understand the various functions in a system and how they interact with each other.

Waste management systems are complex in that they consist of many moving parts that require coordination for the system to function. The FRAM is used in this report to give the reader a greater understanding of how Western Newfoundland's system functions, which in turn allows us to identify gaps in the system which may impact its efficiency.

Waste Management Strategies in Western Newfoundland

Western Regional Waste Management (WRWM) is tasked with developing and enforcing policies that help contribute to the goals outlined in the Provincial Solid Waste Management Strategy released by the Government of Newfoundland and Labrador in 2002. These goals include reducing landfills by 80%, decreasing landfilled materials in the province by 50%, eliminating open burning and incineration, and phasing out unlined landfills. Part of the provincial strategy included creating waste management zones governed by their respective regional authorities. In Western Newfoundland, this is the Western Regional Services Board (WRSB) operating as the WRWM authority.

In 2018, WRWM debuted a residential recycling program, Sort It Western, followed by the ICI (Industrial Commercial Institutional) Policy in November 2019.

Sort-It Western

Sort-It Western is a mandatory, two-stream waste separation program for both residential units (single-family homes) and multi-dwelling units (apartments and condos). Residents are required to separate their recyclables from their garbage, with recycling placed in blue bags and garbage in clear bags. Recyclables include items such as boxboard, cardboard, aluminum, mixed paper, and plastic containers. Single-use plastics such as plastic bags, straws and cutlery, as well as soiled paper, glass, food waste and aerosol cans are considered garbage and sent to the landfill. The bags are then placed at the curb for collection by haulers[1]. It is expected that haulers inspect bags before collection to ensure materials are properly sorted. It is recommended that haulers place a sticker on improperly sorted bags and leave the bags at the

[1] Haulers (garbage collectors) are private companies contracted by the municipality to collect residential and commercial waste in the community.

curb so homeowners can see why their bags were not collected, and properly sort them. Materials such as electronics, metals and other hazardous waste items can be brought to the nearest waste transfer station for recycling. No tipping fee is incurred to recycle these items.

ICI Policy

Waste generators operating within the ICI sector are required to comply with the Sort-It Western program. This includes adjusting their waste management systems to meet the requirements of the program, providing signage and educational materials to facilitate the proper sorting of materials, and working with waste haulers to ensure they are meeting hauler collection requirements.

It is also the hauler's responsibility to comply with the Sort-It Western program requirements, provide waste management education to their clients and ensure the waste to be collected has been properly sorted. Waste haulers play a large role in waste diversion, as their refusal to collect improperly sorted garbage and recycling is an incentive for local businesses and operators to comply with Western Newfoundland's mandatory recycling policies.

Transfer Stations

There are six waste transfer stations in Western Newfoundland operating under WRWM: Wild Cove, Bay St. George, Burgeo, Long Range, Port Aux Basques and Hampden. Materials from both residential and ICI sources are brought to these transfer stations for processing. A tipping fee of $164/tonne (or seven cents per pound) is charged to residents and commercial owners for most materials. Clear bags are sent directly to the landfill located in Norris Arm, which is operated under Central Newfoundland Waste Management. Blue bags are brought to Scotia Recycling, a privately-owned corporation located in Corner Brook, contracted by WRWM and entrusted with the processing, sales, and brokerage of the region's recyclable materials. Any materials rejected by Scotia Recycling (referred to as "residuals") are returned to the transfer station and then sent to Central Newfoundland Waste Management for burial.

Public Drop-Off Sites

For bulk waste, metals and tires, drop-off sites are open from June to October for residents of Gros Morne, with locations in West Bay, Portland Creek, and Bonne Bay South. Tipping fees are applied to these materials based on an average fixed cost. However, certain items including paint, used oil, aerosols, antifreeze, electronics, or cellphones may be dropped off to specific locations by residents for free through Extended Producer Responsibility programs. In Gros Morne, "Paint Share" is available at Rocky Harbour Volunteer Fire Department; "Used Oil Management Association NL" is available at NAPA AUTOPRO Superior Auto Works Ltd. in Rocky Harbour and Northern Tire and Automotive Ltd. in Cow Head; "Recycle My Cell" is available at Rocky Harbour Council Office; and "Recycle My Electronics" is available at full collection sites.[2]

Policy Enforcement

While WRWM prioritizes public education and outreach as the primary means for promoting compliance, an enforcement approach for both residential and commercial materials received at waste transfer stations is listed below. This does not include enforcement for curbside collection which is enforced by municipalities. While these enforcement rules are in place, it should be noted that the frequency of enforcement remains rather low, and this penalty structure is under review by WRSB.

First instance of non-compliance: conversation focusing on education and rule compliance
Second instance: Written warning with enforcement reminder
Third instance: $250 residential fine, $500 for ICI
Fourth instance: $500 residential fine, $1000 for ICI

[2] Full collection sites refer to any one of the six waste disposal sites within Western Newfoundland operated by WRWM. The sites that service the Gros Morne Region include the Long Range Waste Disposal Site and the White Bay South Disposal Site.

Using the FRAM to understand the Western Newfoundland Waste Management System

Extensive qualitative data has been collected through research, interviews, and visits to various organizations to generate the following FRAM model. A FRAM analysis begins with the identification and description of functions necessary for successful performance (Hollnagel, 2012). The aspects of each function are to be identified (however it is not necessary—or possible—to identify every aspect). There are six aspects: Input (I), Output (O), Precondition (P), Resource (R), Control (C) and Time (T). In Figure 3 each of the six aspects appear as a point in a hexagon representing a function. The FRAM enables researchers to understand the relationships between functions, which functions are dependent on each other, and how that may impact the system's performance (Hollnagel, 2012). For the purpose of demonstration, we will highlight select portions using scenarios 1, 2 and 3 below but the completed FRAM model can also be seen in Figure 5.

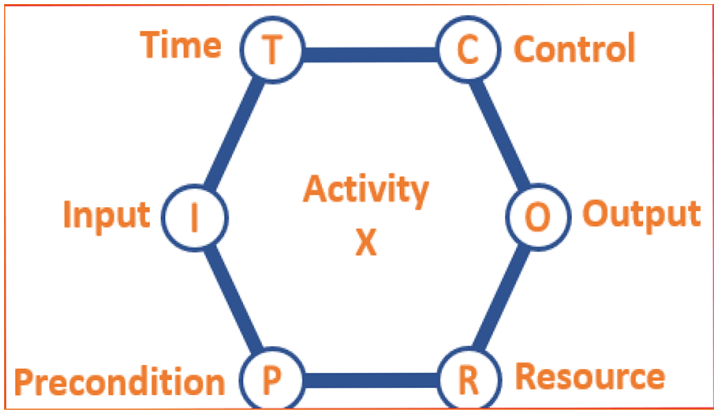


Figure 3. FRAM Diagram. Source link

Figure 4. A small sample of the plastic waste gathered during one of our coastal clean-up audits in the Gros Morne region.

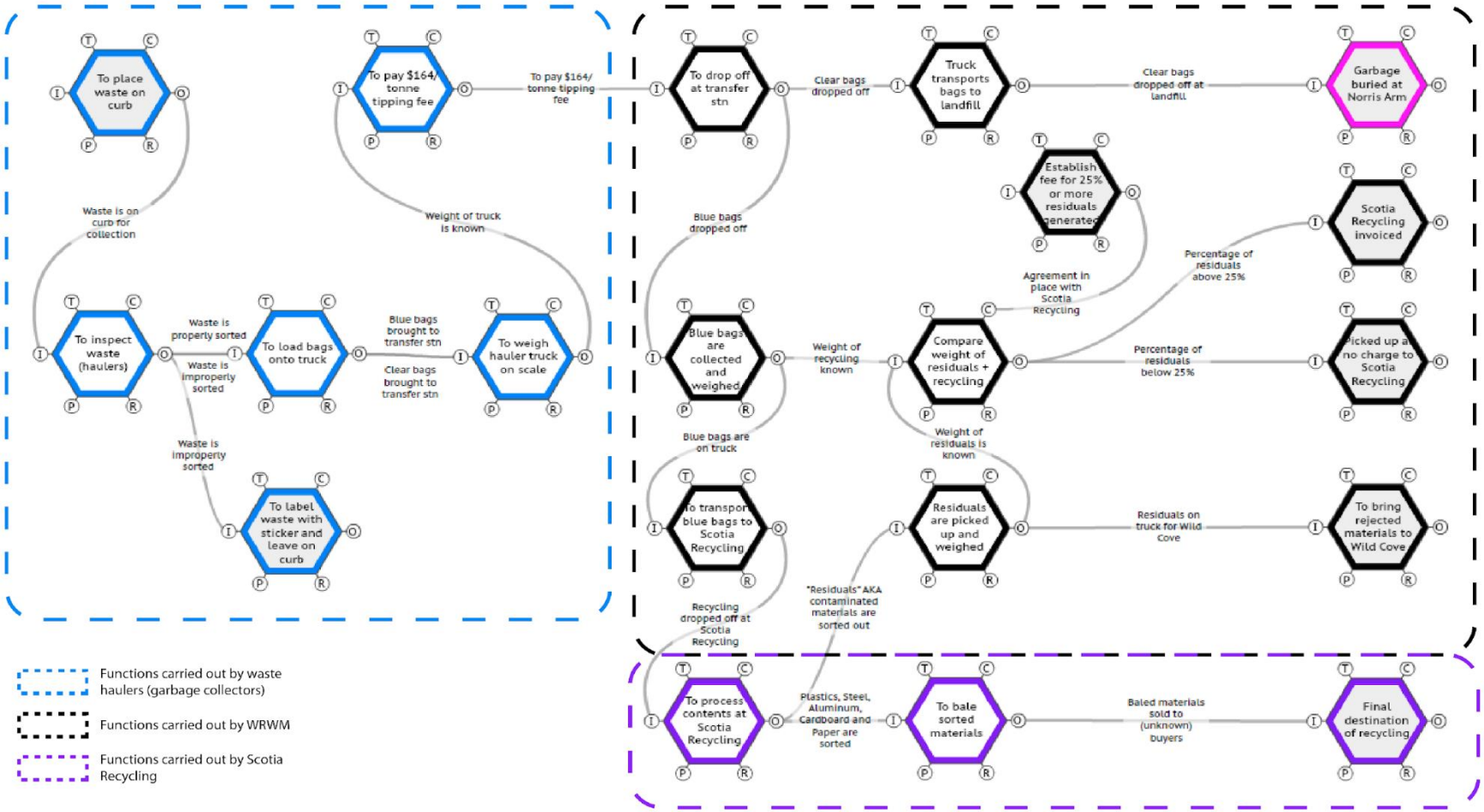
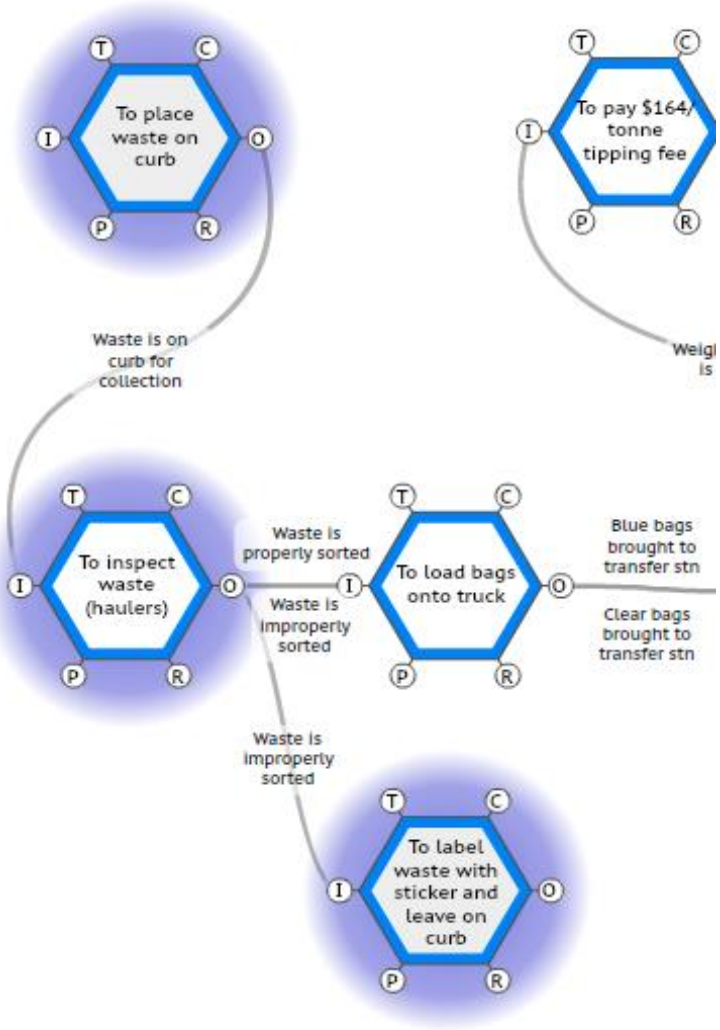
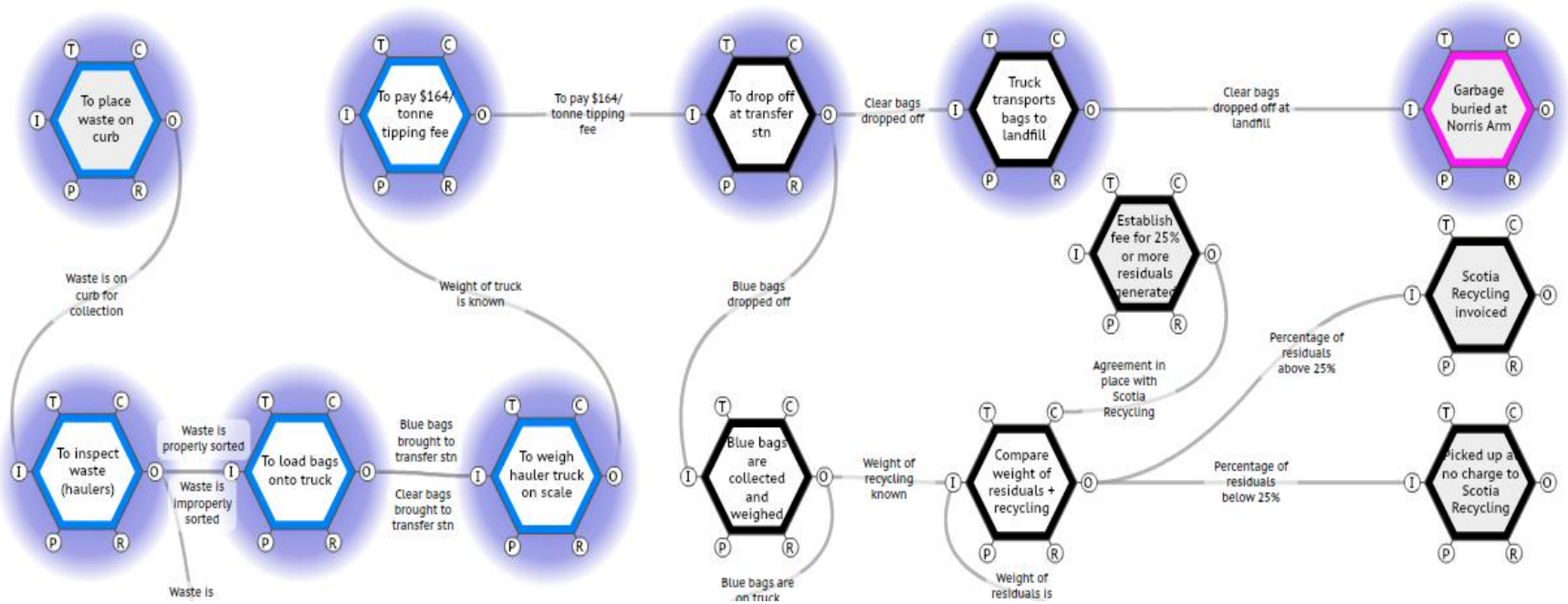


Figure 5. A FRAM model of the Western Newfoundland waste management system.

Scenario 1: Waste left on curb

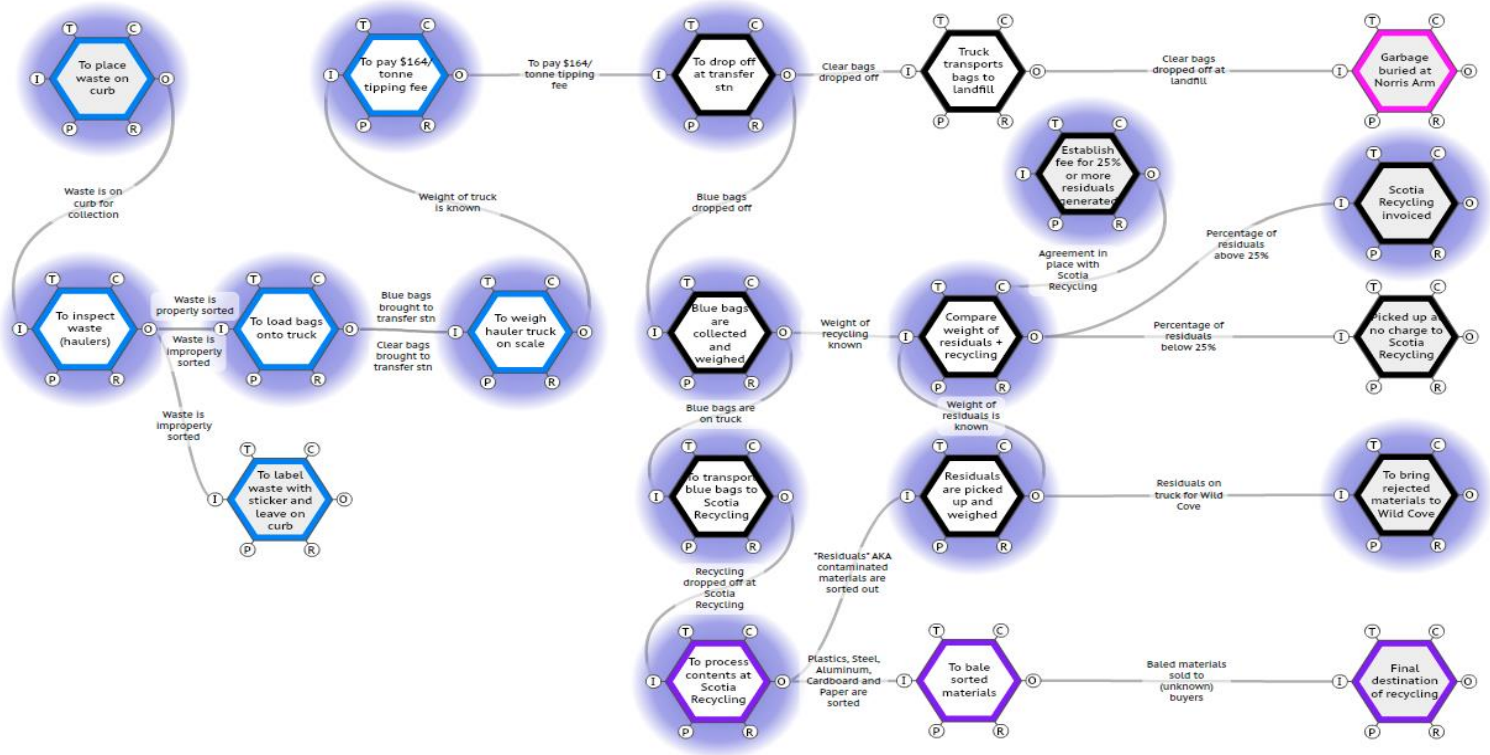
In this scenario, a resident will place their waste on the curb, the hauler arrives, inspects the garbage, and notices it has not been sorted properly. As a result, they label the bag with a sticker and leave the waste at the curb. This information is based on WRWM policies and regulations; however, it is unknown whether this scenario occurs often, or if haulers collect the bags without inspecting them.





Scenario 2: Waste sent to landfill

If the bags have been properly sorted and collected by the hauler, they are then brought to the transfer station. The trucks are weighed so that they can be charged the $164/tonne tipping fee. The bags are dropped off at the transfer station, and clear bags are brought directly to Norris Arm by WRWM for disposal.



Scenario 3: Residuals sent to landfill

This model illustrates the path taken by blue bags brought to Scotia Recycling from the transfer station. Before they are brought over, WRWM must weigh the contents versus sent to landfill. If the rate of residuals is over 25% annually, Scotia Recycling is responsible for any associated costs. Residuals refers to recycling that is contaminated and cannot be sold by Scotia Recycling, therefore it is sent directly to landfill (Wild Cove). It is unknown why waste is sent to Wild Cove whereas clear bags collected at the transfer stations are sent to Norris Arm.

A pathway not illustrated here but worth mentioning is the final destination of recyclables processed by Scotia Recycling. They are "sent to market", however their final destination is unknown.

Identifying Gaps in the System

The following section identifies various shortcomings in the current waste management system in Western Newfoundland. This information has been gathered through government reports, as well as interviews with local government, residents, businesses, and various waste management system players. It is worth noting that the recycling system on the western portion of the island is relatively new—enforcement for the ICI policy only formally began in January of 2021—and therefore compliance may increase as local residents and organizations become more familiar with the new rules and regulations. The more people understand their local waste management system, the more they can participate. According to the consultations through engageNL prior to the 2019 Review of the Strategy, the majority of residents agree with mandatory recycling but, most people when surveyed also feel our current waste management system deserves more improvement.

Lack of Transparency

In collecting the information for the FRAM model, it quickly became clear that there is a lack of transparency regarding how the waste system functions. In speaking to local residents, no one had a clear understanding of what happens to waste after it leaves their curb. During AHOI's public consultations, a resident mentioned how they were under the impression that all materials, including recyclables, that are collected at the curb are sent directly to landfill. Due to various misunderstandings and assumptions, many residents experience a lack of trust in the recycling system leading them to participate less in recycling programs. It took significant research, time, and energy to create the FRAM model in the previous section; it could be reasonably argued that this information should be readily available. Most concerning is the lack of information related to where recycling ultimately ends up. Oceana Canada's study revealed only 9% of Canada's plastic waste is recycled. It is the responsibility of each level of government, and industry to ensure better transparency, accountability, and that plastics in the marketplace are 100% reusable, recyclable, or recoverable at regionally available recycling facilities by 2030. More research and investigation are needed to understand which "markets" Western Newfoundland's plastics are sent to, and whether the system

is truly sustainable. Making this information available to the public could instill more confidence in the recycling system by the local population.

Poor Compliance

Non-compliance in the form of illegal dumping, poorly sorted waste and the improper disposal of hazardous waste often results in wind-scattered debris, polluted marine and terrestrial ecosystems and damage to local wildlife. Non-compliance may be blatant, where illegal dumping or improper waste sorting is done in defiance of new rules or high tipping fees. It may also be accidental, as some community members may be unfamiliar with the new waste policies. A truly resilient waste management system succeeds despite non-compliance, whether blatant or accidental.

Throughout AHOI's public consultations regarding plastic waste challenges and solutions, it was discovered that many residents face barriers to availing of the recycling system and others have expressed frustrations with the new waste management system. Common frustrations cited by residents towards the recycling system include high costs, inconvenience, lack of incentives, and unclear guidelines. Recycling beverage containers alone can be a major challenge as some residents mentioned having to spend hundreds of dollars on fuel to drive to the recycling depot. Recycling other plastic containers becomes a hassle, especially for the residents who have to pay to deliver their waste themselves or aren't accustomed to separating their waste. As a result, many households put everything into one clear bag, or they resort to burning all their waste, polluting the air we breathe with plastic chemicals and leaving nothing to be recycled.

Illegal dumping as a form of blatant non-compliance, is the indiscriminate dumping of garbage, whether at waste facilities, dumpsters, or public and private areas. Figure 6 below demonstrates the environmental devastation attributed to illegal dumping north of the Gros Morne Region. Where the Provincial Solid Waste Management Strategy proposes the closure of uncontained landfill sites, residents of remote communities throughout this region are expressing their disapproval. In response to AHOI's call-out to the illegal dumping near Daniel's Harbour, some residents justified this illegal activity by pointing to the closure of dump sites. During the 2019 Review of the Strategy, environmental enforcement officers from Service NL reported on the increased

number of complaints due to indiscriminate dumping. Poor landfill compliance is also a significant issue, with Service NL staff reporting on uncontrolled site access, illegal dumping, improper garbage separation, scavenging and the burning of waste. High tipping fees in the western region may be partly responsible for residents turning to illegal methods of waste disposal. This highlights the need for enhanced public outreach and education. If public outreach included a better understanding of non-compliance in addition to conveying the true repercussions on local ecosystems, wildlife, and the health of communities then, this may discourage the public from polluting local areas and adhering to the recycling policies in place.

Figure 6. Evidence of illegal dumping on the coastline north of Daniel's Harbour. Anonymous tip from community member provided to AHOI November 2021.

Enforcement

Enforcement would certainly have an impact on non-compliance and other illegal behaviours however, there is a fine balance to be struck. Environmental protection officers from Digital Government and Service NL along with water resource officials from Environment and Climate Change are both responsible

for monitoring and enforcing regulations to protect the environment from improper waste management. These officials were joined by Newfoundland and Labrador's Resource Enforcement Division from Fisheries, Forestry and Agriculture in spring 2021 to expand capacity to combat threats of illegal dumping. Evidence of illegal dumping is devastating many locations along the western coastline of Newfoundland. The heavy fines applied to community members for illegal dumping may lead to resentment towards local waste authorities and potentially exacerbate illegal activity. However, little to no enforcement can lead to greater rates of non-compliance and a general disregard for local policies and regulations related to waste management.

Under Newfoundland and Labrador's *Environmental Protection Act*, waste-related offences are subject to a fine of $500 up to $10,000 for individuals, and $1000 to $1 million for corporations or local government authorities, yet convictions have been few and far between. A litter audit by Multi-Materials Stewardship Board (MMSB) in 2016 found through extrapolated data that 92 million pieces of litter scattered provincial roadways. The visible evidence of scattered litter persists today yet administered charges do not reflect this. Documents of past charges administered by the province for waste-related offences are highlighted in the 2019 Review of the Strategy and show a total of 7 charges laid in 2018. In the Review, it is recommended that enforcement authorities be implemented at both the local and regional levels, citing "handling points" as *the most effective* opportunity to control non-compliance. In the case of Western Newfoundland, these handling points include the curb for residents, waste collection areas for local businesses, transfer stations, drop-off sites and landfills.

Accountability of Waste Management System Players

Another significant issue that is closely tied to that of enforcement, is the lack of accountability of various players in the waste management system. If local businesses place their improperly sorted bags in a collective waste container, the waste hauler is unable to discern which business is non-compliant, making enforcement difficult. If waste haulers can identify improperly sorted materials and refuse collection, it would create an incentive for local businesses to comply, however it may also lead to hostility, strained business relationships, and frustration towards the municipality contracting the hauler. Alternatively, a labelling system could be implemented, where local businesses must place a

sticker or tag on their garbage bags so that non-compliance can be traced back to the correct entity. This leads to questions about the source of non-compliance; was the local business properly informed of the rules and regulations? Was there miscommunication that led to a different interpretation of the rules? Or are they blatantly ignoring the rules out of frustration with the system? The goal is to create a waste management system resilient enough to function despite breakdowns in the system, such as the example described above.

Coordinated Decision-making/Gaps in Public Outreach

Through AHOI's consultations with residents and businesses, it became clear that a source of public frustration was the lack of coordination amongst the various regions. The difference in tipping fees and how recyclable materials are separated at curbsides may reflect different public behaviours. While the list of recyclable materials remains the same across the province, the difference of having one recycle bag versus two, depending on which region you are in, can be a cause for inconsistent waste management practices across Newfoundland. Many found the higher tipping fees in Western Newfoundland to be most frustrating and the differences in waste separation protocols for businesses and residents to be confusing, which can further strain public outreach efforts.

Effective engagement with area residents and communities is vital, as many are unaware of the current waste strategies in place, what is required of them to comply successfully, and where their recycling and garbage actually ends up. If only 9% of plastic waste in Canada is recycled, then educating residents across the country about where the remaining plastic ends up while informing them on different recycling programs and their compliance requirements. Broadening this focus of public engagement may be an incentive for households and businesses to participate more enthusiastically in their local waste diversion programs. According to the 2019 Waste Audit Report by MMSB, amongst the 35,000 households in Western Newfoundland, 18.7% of curbside waste collected is actually recyclable which includes plastic and other materials like metals and paper. This diversion rate is limited by the number of contaminated items found in blue bags. If residents of Western Newfoundland understood what happens after their waste leaves the curb or after their recyclables leave the island,

through broader public outreach, this can affect lasting behavioural change and residents may be more compelled to follow local recycling guides.

We must also consider whether outreach efforts to various demographics have been effective. More comprehensive public awareness campaigns are not only necessary in more populated areas, but in rural, isolated areas as well. The latter may not have strong internet connections, may rely on radio or word of mouth, or may face any number of challenges that can make outreach difficult.

Case Study: Gros Morne National Park and the Gros Morne Region

Through the Government of Canada's Zero Plastic Waste Initiative, AHOI's project, "Working Together to Create a Circular Economy for the Gros Morne Region", is identifying plastic leakage points in the Gros Morne region, learning about the gaps in the provincial waste management system and piloting new programs to address localized inefficiencies. These pilot programs are designed in partnership with local businesses, municipalities, the Gros Morne Cooperating Association (GMCA) and Gros Morne National Park (GMNP) to not only address problematic plastic waste but also to promote the value of sustainable tourism that is possible within the Gros Morne Region.

A Regional Problem

Tourism within the Gros Morne Region has been identified as a plastic leakage point. Many visitors come from places all over the world with different waste separation practices. Some visitors speak limited English or French, which must be taken into consideration when formulating public outreach and education materials. There are no communities located within the park; however, seven exist on its borders. Additional traffic through the park consists of travellers making use of Route 430, which goes along the Western Coast of Newfoundland and is the main access route to the Labrador Ferry Terminal in St. Barbe. As a result, staff at GMNP observe significant illegal dumping and littering in and around parks-owned roadside waste bins. Even when waste is disposed of in a bin, a common challenge among commercial sectors in the region, including local businesses and the national park, is that recycling is often limited to the separation of beverage containers. Other recyclable materials, including plastic containers, are often contaminated, or placed in the garbage

bin. The cost of implementing recycling infrastructure at local businesses can also be a barrier in the effort to improve recycling compliance by the public. Therefore, a shared opportunity for the park, municipalities and surrounding local businesses is to target the inefficiencies of the recycling system.

Waste System Infrastructure: Gros Morne Region

In 2021 AHOI formally partnered with GMNP and the GMCA for the sub project: "Becoming Plastic Waste Free in Gros Morne" to tackle issues in the waste management system identified within the park that may be resolved as a region. Parks Canada is committed to waste diversion as illustrated in the Gros Morne National Park Management Plan 2019. As stated in their Management Plan, Objective 1.8 aims to improve waste management by "being compliant with Western Regional Waste Management's improved 2018 recycling and waste management standards by 2021". The partnership Parks Canada has with AHOI and GMCA is reflective of their commitment to being environmental stewards and shows how the Government should lead by example. The problems present in GMNP are a reflection of what is occurring at a larger scale in the region. In learning about the waste management strategy in Western Newfoundland, it became clear that increasing compliance in the park would have very little impact on overall waste diversion if the system's infrastructure was not resilient enough to compensate for non-compliance in other areas. To add to this, lack of provincial support, limited funding opportunities and low capacity has added extra barriers, making it almost impossible for them or any business to achieve this objective.

Despite visitors' best efforts, contamination in the recycling bin is likely to occur. If this waste is mixed with other recycling collected by haulers, the amount of contaminated recycling that must be sent to landfill is compounded. Even if park waste was properly sorted, travellers along Route 430 that stop just to unlawfully dispose of their unsorted waste materials at roadside bins can create further complications. Waste haulers collecting these bins potentially face fines when they arrive at the transfer stations. Should they refuse to collect this waste, Parks Canada is faced with the burden of illegally disposed waste by travellers who never set foot in the park. Organizations such as Parks Canada have limited control over the actions of highway travellers, so we look to the waste management system. We must continue to improve upon our strategy until we have a truly resilient system which can succeed in spite of aberrant behaviour.

Despite this, opportunities for improvement abound, especially as Parks Canada collaborates with NGOs like AHOI and GMCA in various ways to increase public education and outreach to reduce waste in the region. In the summer of 2021 this partnership took off with coastal beach audits to better understand what types of plastic pollution were washing up on our shores. Together with our "AHOI Waste Busters", summer workers from GMNP and GMCA and volunteers from the communities in the area were able to clean and audit almost 12 km of coastline in the Gros Morne region. A portion of what was collected from this research is detailed in our blog but in short, food packaging was one of the top four items most frequently collected, making littering a true issue for this area. A larger report on the results from this on-going research will be released March 2022.

Figure 7. Volunteers and our partners helping to audit the plastic waste collected during a community beach cleanup in Norris Point, NL. Photo by AHOI

GMNP, GMCA, AHOI and our Communities: Research Project

The beach audits solidified the issue at hand and from this AHOI developed educational signage for the region and has proposed they be placed in campsites, trailheads, and by roadside lookouts throughout the communities and national park. Once installed, AHOI hopes to research the effectiveness of improved signage and visitor compliance with recycling and overall total waste reduction throughout the region. These signs include catchy phrases to discourage littering, direct visitors to use and refill their reusable water bottles and improve the proper sorting of waste. The most problematic areas will receive signage, and over the course of the three-year partnership agreement for "Becoming Plastic Waste Free in Gros Morne", AHOI

will monitor recycling and garbage at test sites within park boundaries and communities to compare results. The data collected from this project will be used to continue informing recommendations for improving the Gros Morne Region's waste management system with the overarching goal of increasing plastic waste reduction and diversion.

Visitors of Gros Morne National Park often spend time experiencing the local charm of the surrounding communities. Having consistency among the seven municipalities and Parks Canada in terms of waste separation and informative signage can help visitors reduce their plastic footprint while appreciating the sustainable efforts of the region. Consistent messaging by the park, businesses, and municipalities will encourage more people to avail of refill/reuse programs and recycling systems.

Community events are vital to the culture and people of the Gros Morne Region. Events like the "Gros Morne Theatre Festival", "Trails, Tales and Tunes" or "Writers at Woody Point" bring in lots of visitors to the local communities to experience the art, music, live entertainment, and hospitality sector. AHOI has worked with municipalities to help avoid single-use plastics during public events. During the Trails, Tales and Tunes Festival of summer 2021, AHOI provided reusable drinkware for the performers at the Norris Point Town Hall to avoid plastic water bottles or red solo cups. AHOI recognizes the potential to expand this initiative to help service other community events hosted in the region and will continue to find innovative ways to increase a reusable alternative.

As municipalities organize curbside waste collection to ensure it is sent to the nearest waste transfer station, it is worth considering the types of materials that are commonly distributed throughout the local economy. Certain types of plastics that are sold and distributed in the Gros Morne Region are not compatible with the recycling capacity in Newfoundland and Labrador. Only plastics numbered 1-5 are compatible with the two recycling facilities, including Scotia Recycling, where recyclable materials in Western Newfoundland are sent. Many plastic materials sold and distributed in the Gros Morne Region are instead discarded as landfill waste. Plastic materials that aren't labelled with a number, or that are labelled with a number greater than 5 should not be distributed locally where alternatives are available.

Recommendations to Improve Waste Management in the Gros Morne Region

Some other recommendations for the region to help reduce litter and increase recycling compliance include but are not limited to:

- Label garbage, recycling and refundable[3] bins with diagrams to assist visitors in separating their waste.
- Install signage at campsites and in public buildings to encourage visitors and customers to refill reusable water bottles at Blue W stations, a global tap water refilling network.
- Put trail and roadside signage in place to discourage littering and encourage visitors to use the bins.
- Create collaborative social media posts by Parks Canada, GMCA and AHOI that discourage visitors from relying on single-use plastics on their trip while increasing awareness of proper waste management practices in the Gros Morne Region.
- Move all waste bins at campsites to a roundabout that visitors pass through when entering and leaving the site. This design will encourage them to collect their waste and place it in the appropriate bin when leaving the campsite.
- Increase bin size to prevent the overflow of garbage.
- Provide informative print materials at welcome centers or permit booths, informing visitors of how to sort their waste as well as the dangers litter poses to wildlife.
- Place waste and recycle bins near a water source so visitors can rinse recyclables before disposal and to prevent contamination.
- Organize community events with reusable drinkware to replace single-use plastics, including cups and bottles.
- Require backyard compostables to replace single-use plastic take-out containers to reduce the waste burden and potential contamination to the recycling stream.
- Introduce a bylaw (AHOI has prepared a model which can be adopted) to ban the sale and distribution of unnecessary single-use plastics.

[3] "Refundables" are redeemable beverage containers that are recycled as part of the deposit-refund program

- Work with the region to create an improved composting program that enables the region to dispose of their organics more responsibly and divert this waste from the landfill.

Going Forward

Increasing the resiliency of the current waste management strategy requires us to look at waste not as a burden, but as a resource. There is much to gain from taking a critical look at the infrastructure in place, reducing inefficiencies and creating jobs and opportunities that will strengthen the system and the region.

Extended Producer Responsibility (EPR)

Extended producer responsibility (EPR) is a policy approach that shifts the responsibility (financial and/or physical) of the post-consumer stage of a product's life cycle to the producer itself (OECD, 2021). This puts the responsibility for waste management on the producer rather than municipalities. Producers are incentivized to adopt the full life-cycle cost accounting for their products. Just as production costs are factored into the final cost of the item, so would the costs associated with product end-of-life management. This would shift the burden from taxpayers to producers and consumers instead, with the ultimate goal of reducing waste generated and sent to the landfill.

In 2009, the CCME published the Canada-Wide Action Plan for Extended Producer Responsibility, which outlines their vision, objectives, and strategies for implementing various EPR programs, of which they provide models to serve as a template. Once producers become more financially responsible for their product's end of life, products will not be designed for single-use rather, they can be composted, recycled, or repurposed. The province of Newfoundland and Labrador should be looking at an EPR program for paper and packaging that ensures products are sustainably designed and re-circulated into the economy. Including a "producer pays" model can incentivize producers to better design their packaging materials so that communities aren't left with the waste. If all packaging is made of at least 50% recycled content, as detailed in the CCME Zero Waste Action Plan, this can better ensure that recyclable material has a place to go. Responsible packaging should include a design that

is compatible with recycling facilities, made with the highest percentage of recyclable materials, or designed to be compostable or reusable.

There are already a few successful EPR programs on the west coast of Newfoundland. Green Depots are a network of independently owned and operated enterprises which produce revenue through beverage container collection. They are licensed by the Multi-Materials Stewardship Board (MMSB) with the goal of encouraging recycling through a deposit-refund system. The plastic, glass, tetra, aluminum, and steel products are purchased by various manufacturers across North America to be recycled into new products and be used again. Other programs in Western Newfoundland include recycling products such as paint, electronics, used oil, antifreeze or aerosols, and other materials that are particularly difficult to recycle and may pose harm to the environment and human health.

Public Outreach and Education Programs

The key to garnering public support for future waste initiatives is through public engagement, education programs and outreach efforts. Many residents and local businesses may be unaware of where their garbage goes after it's placed on the curb. If the community members of the Gros Morne Region knew the full extent of the damage plastic debris causes to the wildlife at their local beach, there may be an incentive to sort waste carefully as increased public outreach can promote lasting behavioural change.

WRWM has taken efforts to educate the public on the Sort-It Western and ICI Policy regulations, including paper pamphlets that were sent to local businesses when enforcement for the ICI Policy began. With the help of NGOs like AHOI working with WRWM, we can work more closely with businesses to not only help improve compliance with the waste regulations, but also prevent the use of plastics and other materials destined for landfill. Prevention is key, and AHOI has a number of resources for helping businesses shift to a more sustainable model that would significantly reduce the amount of waste produced.

Educational programs for schools in Gros Morne provide an opportunity to educate students on the true impact their garbage and recycling has on the local environment. While the MMSB has educational material available through "ReThink Waste", it would be a great benefit for programs to be more

applicable to the Gros Morne Region. Done collaboratively with WRWM and AHOI, it would be an effective way to influence household habits, as well as instill a sense of responsibility for the environment in our future generations. Currently, AHOI is developing an "Ocean Ambassador" program in hopes to engage more youth in the Gros Morne Region to divert plastic waste and keep our ocean healthy. Informative and interactive activities can engage young stewards in a much more meaningful way and teach them to think critically about the repercussions of using the products their parents or guardians purchase daily.

Figure 8. Plastics Program Coordinator, Jackie Bauman showing the kids of Gros Morne how to repurpose your thin film plastic pollution destined for the landfill by making ecobricks. Photo by Pilvi Keto-LeBlanc.

Fail-safes in the System

A fail-safe is a design feature in a system that, if a type of failure were to occur, would respond in a way that prevents any damage to the function of the system, environment, or people around it (Herena, 2011). What the current waste strategy is lacking is a fail-safe. There are a number of vulnerabilities in the system where failure to comply with waste policies leads to large amounts of

contaminated waste sent to landfills. This is also demonstrated in the FRAM model included in this report. Below is a list of options that can be implemented to improve the waste management fail-safes for the Gros Morne Region.

1. *Mandatory Washing Stations at the Waste Management Facilities*

When a contaminated piece of recycling is mistakenly tossed into the bin, this poses the risk for its entire contents to become contaminated and sent to landfill rather than recycled. In the case of Parks Canada, it's difficult to ensure 250,000 annual visitors are washing their recyclables. Implementing washing equipment at waste management facilities, rather than putting the onus on the business or visitor, would ensure that recyclables can still be baled and sent to Scotia Recycling, despite aberrant behaviour causing their contamination. More research into the costs and benefits of implementing new equipment should be explored. Amending policy could include a requirement that contracted recycling companies purchase washing equipment to reduce recycling sent to landfill.

2. *Monitoring and Enforcement*

In the 2019 Review of the Strategy, the report recommends the province significantly increase the enforcement of waste-related policies at the local, regional, and provincial levels. Monitoring and enforcement will help to maximize waste diversion efforts, as well as limit illegal dumping and littering. Enforcement not only helps to control poor waste practices but protects damage to vulnerable ecosystems and wildlife caused by indiscriminate dumping and the burning of garbage. It also helps demonstrate the importance the region places on its waste policies and regulations. While enforcement fines have been put in place by WRWM, they remain ineffective if rules are not being enforced by authorities and community members can continue to disregard recycling policies.

3. *Waste Haulers (Garbage collectors)*

As demonstrated in this report, waste haulers play a key role in the region's waste strategy, as they are essentially the gatekeepers to the transfer stations. Their refusal to collect improperly sorted garbage places responsibility on residents and businesses to follow the rules and policies in place. Conversely,

their collection of poorly sorted waste communicates to community members that the policies are mere suggestions; that failure to comply has little consequence since their waste was collected anyway. Evidently, there is a key opportunity for enforcement through waste haulers. When a waste hauler encounters a contaminated bag of recyclables, they should refuse to collect it. Instead, they have the opportunity to let the individual or household know about the source of contamination so they can course-correct the situation.

Following the Lead of Other Provinces

While some of these recommendations may sound difficult to implement, we can look for inspiration in other provinces that have successfully done so, and in return have seen improvements to the system. Divert NS is a sister organization of the MMSB, operating in Nova Scotia (NS). Annual funding is provided to support municipal waste management enforcement; in 2021, $700,000 was provided to fund municipal enforcement activities, and $770,000 towards educational efforts. Through this organized funding, they are able to contract work to mobilize several waste diversion initiatives including investigating illegal dump sites, receiving and reviewing complaints, educating residents and businesses on enforcement, auditing waste facilities, and issuing warnings and tickets. With the increased use (and indiscriminate disposal) of single-use plastics, as well as illegal dumping due to the COVID-19 crisis, Divert NS has increased enforcement accordingly. According to Roschell Clarke, the solid waste education coordinator for Cape Breton Regional Municipality Solid Waste:

> "It's a really, really good program for us, and our community really likes it. They like to know that there are things getting done when they call to report illegal dumping, instead of calling and leaving the information and then it goes nowhere."

Jeff MacCallum, chief executive officer at Divert NS says:

> "Utilizing the funding to get a full-time constable in place has proven to be very effective for Cape Breton Regional Municipality in their objective. It's a good example of the funding and the program's working."

It is vital to the success of the strategy that regional service boards have an effective enforcement regime in place to monitor compliance at both the local and regional level, and the proper funding to do so. There are more examples like Divert NS that can provide a template for the Gros Morne Region and the WRWM to follow in order to strengthen our waste management practices and increase the diversion of waste from landfills.

Looking Beyond the Waste Management System

Sustainable Tourism: Transitioning Towards a Circular Economy

Local waste management in the Gros Morne Region is not only tasked with handling municipal waste, but the waste produced by upwards of 250,000 visitors annually. As travel begins to increase in a post-COVID world, now is an opportune time to shift to more sustainable tourism practices and move towards a circular economy. Moreover, the Government of Newfoundland is launching the 2022 Come Home Year which includes investments into this celebration and an opportunity to implement everlasting green infrastructure. Before visitors arrive, there is an opportunity to educate them on Western Newfoundland's waste management practices and encourage visitors to avoid single-use plastics when packing for their trip. For example:

- Tourism websites could feature messaging with ideas for sustainable packing lists that include hygiene products and plastic-free snack options.
- Websites for booking tourism activities could encourage tourists to bring reusable water bottles and containers for storing food on excursions.
- Educational print materials could be displayed at frequently visited hubs, such as the Gros Morne Discovery Centre and the Deer Lake Airport and Ferry Terminals, to educate visitors upon their arrival.
- Popular tourist websites, such as Visit Gros Morne and Gros Morne National Park can promote sustainable, plastic-free travel ideas on social media and other online platforms.
- Local businesses and accommodations can work with organizations like AHOI to create a more circular business model and step away from single-use plastics, enabling a more sustainable, eco-friendly offer to their visitors and guests.

Figure 9. With AHOI's support, tourism companies like Gros Morne Outdoor Company, Taste of Gros Morne and Gros Morne Adventures have made the switch to plastic-free metal containers to reduce their plastic waste and become more circular. Photo by Greg Knott

Promoting sustainable tourism is increasingly valuable for local businesses and municipalities that surround the Gros Morne region. AHOI recognizes the value that sustainable tourism also has on reducing the waste burden. Limiting the burden of recycling and potential contamination within the system can be done by limiting the distribution of disposable materials.

Reducing Plastic Pollution in the Hospitality Sector: AHOI Pilot Program

AHOI launched a Plastic-Free Business Pilot Program in the summer of 2021 to target plastic waste generated in the food and beverage sector. This pilot project was designed to help businesses become more circular through the access of alternative compostable and reusable take-out container options. Thirteen businesses participated in AHOI's sustainable take-out program during the summer of 2021 and have been able to eliminate the unnecessary plastic waste generated from their customers ordering food to go. To measure the amount of plastic waste diverted, AHOI partnered with eight of the 13 businesses

which included a local farm, three restaurants, a community kitchen and three adventure companies. These businesses conducted a "Plastic Waste Audit" before making their plastic-waste-free transition; enabling AHOI to assess the amount of waste diverted because of this program. In addition to the containers, these businesses received educational marketing materials including table and info cards developed by AHOI. These materials let the customer know what the business was doing to help our region reduce its plastic waste and how they could participate. As more awareness is raised about the impacts and solutions to single-use plastics an increase in businesses wanting to participate is expected to occur. There are several ways local businesses can shift to become a more circular and sustainable company to lessen the environmental impact and offer eco-friendly experiences for visitors.

Businesses and AHOI: Recommendations

The following actions were recommended to help increase recycling compliance and eliminate unnecessary single-use plastics in the tourism and hospitality sectors:

- Install signage and window decals at local restaurants to encourage customers to refill their reusable water bottles at local businesses as listed on Blue W, a global tap water refilling network.
- Swap out single-use plastics for sustainable packaging (such as reusable jars and containers, offering travel mugs for purchase, and refraining from selling plastic water bottles to patrons).
- Offer reusable containers and drinkware whenever possible for food and drinks, and when reusables aren't an option, choose only the disposable products that can be backyard compostable.
- Collaborate with other local food service businesses to work together to replace single-use plastics with backyard compostable take-out containers to reduce waste burden and potential contamination to the recycling stream.
- Order take-out containers through a bulk purchase with other businesses (such as the one by AHOI) to reduce the impacts of shipping emissions.
- Organize a way to compost organics at your business or collaborate with other businesses and local municipalities to create a regional composting program.
- Become familiar with the waste diversion services available nearby.

Conclusion

It is not an overstatement to say we are in the midst of a plastic and waste management crisis. To tackle this issue, we must not only act at federal and provincial levels, but regionally as well. It is up to local municipalities, businesses, organizations, and institutions to take the necessary steps to reduce their environmental impact and make it easy for community members to transition towards a more circular economy and access their services without negatively impacting the environment. This report serves as a guiding tool to provide knowledge and recommendations to decision makers and the general public about the current waste management system, while also identifying gaps in the system which result in littering, pollution, non-compliance, and increased landfill use. While western Newfoundland has made huge strides towards improving the waste management system in just the past few years, there is still much to be done for it to work effectively to ensure the majority of our waste doesn't go to the landfill.

Future Research

AHOI is continuing to work with local businesses, organizations, community members and government to move towards a circular economy, tackle plastic waste production and improve current waste management strategies for the Gros Morne region. AHOI will focus on closing the loop on circularity and identify key sources of plastic waste and opportunities to compost our organics. They will continue to tackle this issue through projects such as this, public outreach and education, community events, sustainability programs, consultations with local businesses and organizations, and policy recommendation development. This report is just the first step in diverting plastic from landfills and making the Gros Morne Region not only plastic free but one step closer to becoming more circular.

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