

2021 ICI Diversion Project Final Report

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ICI Diversion Project Final Report

Nanaimo Recycling Exchange Society (NRES) was awarded \$48,983.00 to complete the 2021 ICI Diversion Project, using data from the 2020 Waste Audit project. The NRES completed waste audits for 15 ICI participants in 2020 (see Appendix A), and the 2021 ICI Diversion Project is designed to a plan, with education and services to these participants to increase diversion. Post-service waste audits will be completed toward the end of the 2021 project that will identify successes, gaps, and opportunities for further support or programs needed to achieve 90% diversion.

Proposed Deliverables

The NRES proposal included deliverables:

1. A tailored waste diversion plan, based on waste audit data from the business, will be provided to each participant.
2. Ongoing post-audit point of contact service and assistance to implement diversion plans.
3. Post-service waste audits will be completed for each participant.
4. Post-service waste audit reports will be provided to each participant.
5. An aggregate report will be provided to the RDN that includes
 - Summary quantitative and qualitative data important to removal of barriers, best practices, and ongoing sector challenges,
 - Summary waste stream diversion data,
 - Best practice sector model principles,
 - General best practices, innovations, and successes,
 - Post-service waste audit analysis,
 - Recommendations supported by data,
 - Inventory of organizations and products appropriate for Circular Economy.

Adjusted Deliverables

Nanaimo Recycling Exchange Society proposed budget totalled \$69,300.00. The project was approved for \$48,983.00, which is 70% of the proposed budget. For this reason, project deliverables were adjusted. For this reason, services to participants, best practice modeling projects, and circular economy inventory deliverables were modified or eliminated from the project. These reductions affected project outcomes.

Tailored waste diversion plans

Waste diversion plans have been completed and delivered to each of the 15 participants (see Appendix B) from the 2020 Waste Audit project. Plans include

1. general instructions for managing or eliminating waste according to the waste hierarchy, RDN bylaws and landfill bans,
2. specific instructions for managing or eliminating waste within our ICI waste management system and services, and
3. solutions to remove barriers, increase diversion, and highlight best practices.

All businesses were encouraged to incorporate the zero waste hierarchy into their business plan, rather than manage waste as an after-thought.

The plans include recommendations to encourage Reduce and Reuse options, and discourage dependence on failing or dwindling ICI recycling programs and services .

Post-audit point of contact service and assistance to implement diversion plans.

Although some businesses have reported immediate uptake of simple solutions, it is noteworthy that simply providing a suite of solutions and corrections to business owners does not bring immediate results. Business owners have reported

- the lack of viable options
- lack of time to consider the plan options, share the plan with staff, and
- the lack of confidence and knowledge to educate staff and implement changes.

Participants that have achieved significant results from their waste audit plans are the participants working directly and extensively with the NRES.

Plan Implementation

Tectonica Management—the Unbuild Story

Tectonica Construction Mgt. has taken their 2020 waste audit results as incentive to do better, and has requested NRES support to implement their diversion plan for their multi-family construction project in Parkville. Because the construction phase will carry into 2022, this report is mainly from 2021 deconstruction phase, with some data from early construction phases.

NRES introduced the concept of deconstruction, as an alternative to demolition, for removal of 3 houses and some out-buildings on Tectonica’s construction site. Tectonica Management agreed to deconstruct, and contracted the Unbuilders organization for assistance with the project. The Unbuilders typically contract to manage deconstruction and subsequent materials. Because the project was designed as a demonstration for Tectonica to experience all facets of deconstruction, with the necessary salvage practices for successful reuse end market acceptance, a one-of-a-kind contract arrangement was made for the Unbuilders to act as deconstruction for reuse mentors. The NRES managed local end market negotiations, sorting, weighing and transport for all reuse and recycling from the Unbuild project.

Diversion to recycling and reuse: 706 metric tonnes

Disposal: 43 metric tonnes

Diversion from Unbuild: 94% to reuse and recycling.

Tectonica reports one significant demolition project every 2 years.

Tectonica Management–Construction Phase Diversion

For the construction phase, the NRES and Tectonica have implemented further recommendations from the Tectonica waste audit plan. On-site source separation stations provide for collection of

- 24 construction products, (see Appendix C)
- diverted to 10 separate destinations.

NRES has engaged the Tectonica management team in problem-based learning, resulting in several on-site solutions for diversion; for example, end-cuts and other waste lumber on site will be designed into feature walls and landscaping products.

On-site reuse of lumber from the Unbuild displaced 16 metric tonnes of virgin lumber (See Appendix D). Complete project diversion data will not be available until project end in May 2022.

Covid and weather events have significantly delayed the construction phase causing lack of supply, labour shortages, weather damage to the site, and weather and Covid travel restrictions for workers. Although progress has been slowed and stalled, there is substantial culture change and re-thinking of product use: lumber wrap is being used for tarps, workers are organizing “single product” piles to maximize full use when a smaller piece of a product is needed. This is progressive change from typical grab and go, with end of day collection of products for the garbage bin.

Construction and demolition has long been a mainstay of bin service hauler business. To achieve diversion success, NRES implemented a “smaller hauler” model of small and frequent hauls to recycling depots or reuse facilities. This practice not only relied on NRES knowledge of products, knowledge of the reuse and recycling system, and negotiating skills to broker materials, but also competed with convenience of using on-site mixed waste bins, later confirmed by the hauler as sent to the landfill from this project.

NRES approached the hauler about incorporating a smaller hauler model to divert a greater number of products. The waste hauler reported no interest in making any changes to current large bin model.

It is notable that diversion is calculated by weight. Construction waste diversion can look successful by simply diverting heavy materials such as metal, wood, asphalt, and rubble. Of these, metal is the only product recycled back into another product. Asphalt is ground and used by local haulers to fill land at their sites, wood is sent to become waste to energy at local mills or ground to be used as landscape cover, and rubble is largely used to fill land.

Diversion of construction waste solely by weight was not considered measure of success for this pilot. The NRES/Tectonica 95% diversion looks much different from a bin hauler’s 95% diversion from a demolition project for two main reasons: deconstruction preserves materials, and the “smaller hauler” model ensures highest and best use of materials.

Significant tonnages of metal, wood, and bricks were delivered to various reuse destinations, instead of to “recycling.” Social enterprise labour was engaged for tasks such as de-nailing wood and cleaning bricks. Hard to recycle materials such as insulation, treated wood, vinyl siding, windows and doors, cabinetry, panelling and millwork were diverted to reuse. Tectonica spent months on the deconstruction, endured thefts, and donated valuable materials for no return. The NRES spent significant time brokering products to multiple destinations to ensure diversion to a higher use. Yet, tonnage diversion from deconstruction looks the same on paper as tonnage diversion from demolition.

RDN support of NRES involvement was critical for Tectonica’s choice for deconstruction over demolition, for the experience of successes and failures, and for the institutional knowledge the company has acquired for the future.

Friends of Haven Reuse Facility

Reuse facilities receive donations of products that would normally be recycled at no charge through consumer EPR programs; however, by virtue of the donation to a thrift store, donated products become property of the business.

If the product isn’t sold, the business then incurs cost and inconvenience trying to recycle or otherwise dispose of the items. Because EPR programs do not accept recycling from businesses, many of these products are going to landfill or scrap metal, or reuse employees are sneaking the products into EPR streams at local depots. Yet, the consumer has paid the eco-fee to EPR at point of purchase for recycling that product.

Lack of options for management of unsold EPR is a barrier to recycling diversion, and a costly oversight for reuse facilities. In addition the assumption for this pilot is that lack of recycling options for reuse facilities hinder diversion to reuse.

NRES approached CESA (Canadian Electrical Stewardship Association) to implement a joint pilot project to achieve

- a) recycling of these products, and
- b) reuse tracking for participating thrift stores.

The joint NRES/CESA pilot was approved and NRES recruited 10 reuse facilities in the RDN to participate in a joint pilot with CESA. One facility dropped out due to lack of collection space.

The pilot was approved in late June, training for staff was provided by NRES in July and August. CESA transport logistics challenges delayed collection start. Collection and transport of CESA products proceeded for 8 weeks and ended December 12, 2021. CESA permitted collection of products at no cost to participating reuse facilities, and the reuse facilities tracked items sold for reuse. NRES provided product identification and recycling/tracking training for reuse staff, and transport of collected recycling to the depot taking part in the pilot program.

The facilities represent a mixed group of for-profit and not-for-profit organizations, geographically dispersed within the RDN. Table 1 shows pilot diversion, and potential diversion if practices are corrected.

Table 1. NRES/CESA/Reuse pilot participant diversion.

Facility	Location	Pilot recycling diversion	Potential participant diversion/yr (approx.)	Percent diversion increase from pilot
SOS Thrift Store	Parksville	3.5 mt	22 mt	100%
*Salvation Army Thrift Store	Parksville and Qualicum Beach	.7 mt	4.5 mt	
Vancouver Island Thrift Store	Nanaimo	Not calculated	2.2 mt (estimated from manager)	Not calculated
*Value Village/Savers	Nanaimo	9.8 mt	63 mt	100%
Friends of Haven Thrift Store	Nanaimo	.35 mt	2.2 mt	100%
Deni's Dynamite Deals	Nanaimo	.7 mt	4.5 mt	100%
Habitat for Humanity Restore	Nanaimo	.35 mt	2.2 mt	100%
Good Neighbour Thrift Store	Nanaimo	.35 mt	2.2 mt	100%
	Totals	15.75 mt	* 66 mt (allows for existing diversion from 2 locations)	

*Savers and Salvation Army collect products for CESA, but took part in the project to a) document reuse, and b) receive program training to improve collection practices.

Because most reuse facilities are not part of EPR programs, the concept of EPR collection, transport and recycling was new and so required awareness education before staff and managers could see potential benefit from the pilot. Logistics of collection, storage, and transport of products for recycling was also challenging as space is a common challenge at reuse facilities and existing CESA transport methods are not designed for small tonnages from multiple small businesses.

This pilot was designed to increase recycling diversion with correct application of EPR principles, but also to increase support to allow these facilities to accept more products and make them available for reuse. It might take 3 coffee machine donations to make one complete product to sell, but this is a substantially better outcome than 3 machines in the metal or garbage bin.

Reuse facilities take great efforts to clean, test, repair, and re-assemble for reuse, and releasing them from the cost of commercial recycling makes this possible. Reuse managers reported,

- “We are working really hard to sell this stuff and keep it out of the landfill.”
- “Storing and testing is expensive.”
- “Reuse is better than recycling. We work hard to get this stuff reused but we don’t get any benefits or services and the stuff ends up in the landfill anyways because we don’t have access to the service.”
- “Wow, this (CESA collection pilot) sure makes life easy. We used to call a hazardous waste company to recycle these light tubes and we were putting the other bulbs in the garbage.”

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- “It’s all going in one direction, now.”

Knowing it’s possible to recycle pieces, parts, and accessories in the EPR program has made it possible for reuse facilities to make complete sets to sell, and to sell pieces and parts so customers can extend life of products.

All participants (except the two current CESA partners) reported the products will go in garbage when the pilot ends.

Generally, all reuse facilities report confusion and mass drop-off of “donations” and some are closing because they can’t manage and store the donations. Reuse managers report that the public is using reuse facilities as the “one-stop-drop” service. Reuse businesses are using each other as drop-off depots because of a lack of recycling options.

There are 55 Reuse facilities in the RDN with potential for EPR recycling after this pilot ends.

The Beacon Multi-Family Residence

The 2020 Beacon waste audit builds on previous work NRES completed with the Beacon in 2015, and their current successful diversion practices. The Beacon waste audit plan recommended some fine-tuning, with education about EPR recycling to keep EPR packaging out of the ICI waste stream. Other than such fine tuning, recycling and organics collection continue to divert large amounts from Beacon garbage.

Increased diversion is a success, but waste reduction requires new strategies. The Beacon has chosen to work on Reduce and Reuse options.

The Beacon asked NRES for research and education support to implement their waste audit plan. NRES has provided the Beacon with an additional plan to reduce packaging, support local farm to table procurement options, increase on-site refill programs, with adjunct education about refusing single use, short use, and toxic products and packaging (see Appendix E).

Continued recycling success at the Beacon is maintained because of strata council policy, high standards for site cleanliness and organization, high residence participation in sustainability efforts, full time site attendant who maintains physical spaces, and a strata council advocate knowledgeable about solid waste. This combination has produced a well-oiled recycling machine, but it is notable that concepts of Reduce and Reuse were not considered until the NRES diversion plan was introduced. Further space challenges for recycling helped the reduce concept take hold. Six years after 2015, it finally makes sense that diverting more and more is ultimately not sustainable, and that Reduce and Reuse are more sustainable. Again, problem based learning takes time, but the results are sustainable and generalizable to the global imperative.

Good news is that, since 2015, the Beacon has become the incidental model for the Gabriola and the Newcastle residents who, by example of the Beacon, are positioned to bypass the 6 year journey getting good at recycling, and go straight to reduce and reuse.

Beacon diversion may increase somewhat from corrected EPR practices.

Investigating and adopting successful Reduce and Reuse practices will take time. Given that moving up the hierarchy for the Beacon has already become a model for the Gabriola and Newcastle residences, the time will be well spent.

Springford Farms and Green Glen Farms: Agricultural Plastic recycling:

Through research and networking, NRES has established linkage with new Vancouver Island plastic re-processing business. This plastic re-processing plant has a model to use post-industrial plastic only. NRES has encouraged a product testing pilot using waste stream plastic, including some difficult plastics such as ABS and PVC, agricultural silage and bale wrap, and construction lumber and building wrap. This creates significant diversion opportunity for waste stream plastic on Vancouver Island where none previously existed.

NRES has connected this island processor with a niche market plastics broker from the lower mainland to move the processed plastic to established markets in the Lower Mainland and the Pacific Northwest.

The new plastic processor on Vancouver Island chose to begin pilot testing waste stream plastic with agricultural bale wrap. This plastic can be successfully recycled off island, but a better option is to recycle it locally.

NRES contacted and arranged collection from 11 farms (see Appendix F), and delivered 1 mt to the processor from an 8 week collection period. Some of these farms collected for less than 8 weeks. 19 farms are now storing bale wrap for the second collection in 2022.

Waste audit (2020) diversion of bale wrap: 0 mt

Post-audit participant diversion from pilot: 1 mt

Potential sector diversion from re-processing: approximately 34 metric tonnes per year from RDN.

Bale wrap is contaminated plastic: the cleaner it is kept, the higher the value to the processor and the more likely the processor is to continue recycling the product. Continued education is integral to continuation of successful bale wrap collection, storage, and delivery to recycling.

Stellar Bay Shellfish

The 2020 Stellar Bay waste audit noted,

“Everything that withstands salt water is made of complex multi-product plastic.”

“ Nobody deals with this waste.”

“Saving the fish is destroying the oceans and we are the stars. You should see what goes on in the remote farms.”

NRES connected Stellar Bay Shellfish with Ocean Legacy plastic recycling project in qathet Regional District, as they were accepting out of region ocean plastic for recycling. NRES also arranged for the new plastic processor to pilot recycling of the PVC and ABS.

Stellar Bay received their waste audit plan, considered options, and decided to reuse all of their PVC and ABS.

Potential diversion was calculated at 9 mt of PVC and ABS product.

Diversion: 9 mt

Flying Fish

The Flying Fish 2020 Waste Audit report recorded Flying Fish garbage containing paper, plastic film, glass and hard plastic because their hauler recycles cardboard only. Hauler practices have not changed.

NRES has identified the Parksville Bottle and Recycling and Church Road facility as a self-haul option to recycle plastic film and plastic containers. Flying fish attempts to self-haul to these products, and further effort to contact commercial services brought the following report,

1. It's a 75 km, 2-hour round trip for a self-haul recycling trip to Parksville Recycling and Bottle Depot and Church Road. Owners and managers make the trip, incurring high labour and fuel costs, while staffing shortages leave the business unattended. Meanwhile, garbage and recycling bin costs, and source separating labour costs persist.
2. Cascades has neither returned nor answered further calls made from this business.

Flying Fish has contracted with Styro-Go to recycle their Styrofoam @\$200.00 per 15 kg bag. EPR packaging (from de-packaging cardboard) previously recycled in commercial bin is redirected as much as possible as carry-out bag replacements. This corrects EPR practice; there is no diversion adjustment.

Potential diversion identified in waste audit: 1.2 mt/year.

Diversion increase: 60 Kg Styrofoam/year

Waste hauler continues to haul remaining recyclables as garbage.

Franklyn Street Dental Group

The Franklyn Street Dental 2020 Waste Audit reported hauler recycling of cardboard only and a frustrated business manager:

- "I've been in business since 1992. I have 5 times the waste and nothing has changed. In 1996, they picked up cardboard. In 2020, they pick up cardboard."
- "Anyone I call refers me to someone else. I don't do that in business."
- "I do it all myself now (as self-haul to EPR depots), but I would rather pay someone else to do it. Just give me a system and I'll buy the bins."

The business pays to shred 275 kg of paper per month (refused by hauler) just to ensure it gets recycled.

NRES provided non-EPR options for recycling paper, plastic, and Styrofoam.

The owner reports that

- extensive travel and inconsistent results from self-haul, and
- lack of collection programs for mixed recycling

remain significant barriers.

Self-hauling has been discontinued from this business. Qualitative report explains.

- "recycling is too hit and miss to spend the time running around."
- "Packaging keeps increasing and so I have more recyclable products than I did a year ago."
- "I'm putting it all in the garbage, now."
- "I am embarrassed that I can't recycle my business products."
- "Packaging and garbage has increased so I'm throwing away more than ever."

The owner of this business has exhausted all reasonable attempts and reluctantly puts these products into the garbage.

Potential diversion from waste audit: .9 mt

Diversion decrease: Stopping self-haul has reduced recycling by .9 mt plus reported increase.

Wenner Group (Electrical contractor)

The Wenner Group 2020 Waste Audit reported periodic attempts by the semi-retired owner to self-haul recycling generated from their warehouse to depots as residential EPR waste. When self-haul wasn't possible, these products were put in the garbage, as was metal and soft plastic. The hauler collects cardboard and paper as recycling.

For waste from the warehouse, NRES provided non-EPR drop-off options for mixed recycling, plastic film and Styrofoam collection options with Styro-Go. NRES also provided options for pilot collection of plastics and transport to the new plastic recycler. Wenner has not engaged with new practices.

Wenner contractors load supplies with packaging for each job and may not return to the warehouse for a week. As such, they operate much the same as mobile contractors looking to offload waste frequently. Wenner reports that, because many construction sites provide garbage collection, contractors most often leave waste as garbage at the site rather than self-haul to the suggested various drop-off locations.

Periodic self-haul (pre-audit) recycled approximately 1.35 mt/yr
Wenner reports leaving waste at construction sites.

Norms Blinds Installation

The 2020 Norm's Blinds Waste Audit reported challenges for self-haul from a mobile business. The owner reported,

- "I might as well be a hauler cuz I haul it forever."
- "I have to do all my sorting in the van and drive it around forever cuz there's no drop off in Nanaimo."

NRES educated this participant about the waste generator principle that makes his entire waste stream residential. Installers are instructed to clean up after the installation, and that is the barrier to keeping packaging in the correct Recycle BC stream. NRES also provided options for self-hauling plastic film and metal to Parksville Recycling Depot.

The owner reports,

- "The packaging takes up 60% of the room in my van. I can't drive to Parksville every day."

Potential for diversion: 1.2 mt/yr

Diversion: no reported change to diversion. This installer follows the customer service policy of the retail blinds organization, which is responsible for incorrect practices. Such retail organizations, surprisingly, pay EPR recycling fees, recoup fees from customers, and then spend the money to recycle the packaging in the incorrect stream.

NRGH Housekeeping department

The 202 NRGH Waste Audit report highlighted some efforts to recycle, hindered by a lack of top-down direction and oversight of the waste programs. After appeals from the workers to senior management brought no results, worker complaints to an RDN director led to the audit of the Housekeeping department practices. During the audit, workers reported,

- "We aren't the decision makers."
- "I never see the contracts for these bins. There's bins everywhere and I don't know half of them."
- "Only the people with Green hearts recycle. If I stop, this is all garbage."

The Waste Audit report and plan was passed to department management from staff. There was no reported interest or direction to implement the plan. Staff continue to self-haul as residential waste, using their time and resources, but don't want to continue.

NRGH Housekeeping department potential diversion was calculated at 8 mt/yr.

Diversion from plan: No change

Workers report an increase in garbage, and an increase of plastic in the garbage since the waste audit in 2020.

Kiwanis Senior's Centre

The 2020 Kiwanis Waste Audit indicated systemic and some management barriers to diversion. At the time of the waste audit, the Executive Director had a vision for a sustainable living village, and was eager to receive the waste audit plan. Change of management and subsequent change of staff has changed the vision, and waste audit plan was not implemented.

Kiwanis diversion potential: 4.4 mt/yr

Diversion from plan: no change

Big Wheel Burgers

Fast food business creates significant packaging and food service waste. Big Wheel Burger (BWB) was recruited as a waste audit participant to highlight their successful diversion practices as a model available for fast food businesses. The 2020 BWB waste audit confirmed sustainable practices and high diversion.

BWB has a sustainability model and brand inextricably linked to their compostable food service and packaging material. However, the compostable industry is in development: many products sold as "compostable" simply do not compost in many municipal composting facilities. Convertus, the RDN organics composting facility, has confirmed that is the case with some Big Wheel food take-out containers and utensils.

To their credit, BWB has always invited scrutiny of their practices: Synergy has provided them with regular audits of the Victoria operation. BWB management has toured Fisher Road composting facility, and was satisfied that the "endless more chances" given to plastic-like compostables at Fisher Road would fully compost their materials: they had no reason to expect different results from Convertus facility in Nanaimo.

The NRES waste audit plan provided fine tuning education and support to help BWB find solutions to divert minimal amounts of plastic film identified as problematic in the waste audit. BWB has made attempts to find and procure products that match local technology. Procurement of wooden utensils has been partially successful, but constrained by supply challenges. When wooden utensils are not available, the supplier defaults to plastic-like compostable utensils.

NRES research for another business uncovered information about non-compostable "compostable" products relevant to BWB take-out operations. As take-out packaging should be managed as residential waste, it was not investigated as part of BWB waste stream. Nonetheless, Nanaimo managers were surprised and disappointed to learn that 1/3 of their take-out service products are being screened and sent to landfill from Convertus.

Given the expense and effort BWB has undergone to consult experts and follow the trail of their products, it's not surprising that the news was a surprise. It is also not a surprise that reporting the information to BWB also put the NRES in a precarious position as the first messenger of bad news. Instead of being an ally, the NRES became the source of a threat to their "farm to plate to farm" brand. This reaction affected subsequent ability to help them implement their plan. Access to local education would have helped this business understand that composting results vary between municipalities, and could have prevented this too-common reaction to information that supports and aligns with their actual brand.

The message about Big Wheel Burger is they are doing the best that technology can provide in Victoria, the best that technology can provide in Nanaimo, and that the results are different. The message to the public in the RDN should be to avoid purchases that use plastic-like compostable products at this time because Convertus Nanaimo is not equipped to manage these products.

Approximately 1/3 of BWB take-out service waste is non-compostable and will be screened from Convertus compost and sent to landfill. This percentage will be reduced after Convertus improvements, but not to zero.

Potential participant diversion: .2 mt plastic film as overwrap.

Diversion: No diversion. Self-haul to Parksville from south Nanaimo not viable option.

Rather than boast a 90+% waste diversion and call it a day, BWB reports commitment to improvement. The measure of successful diversion is uncertain: BWB could stop use of plastic-like products and provide take-out in compostable fibre containers. It would still be the case that RDN residents could place the compost in bins lined with non-compostable "compostable" bags.

Little Star and Well-beings Daycare Facilities

Well Beings daycare was recruited as a best-practice model for other daycares in the RDN. Little Star daycare was included at the request of RDN board Directors who had been contacted to rectify the gap in services when their previously residential-type of curbside services were cancelled to ensure compliance with RDN's Recycle BC contract.

Daycares have no significant tonnage to divert, but even minimal waste hauler charges for recycling and garbage are cost prohibitive to the industry. For this reason, eliminating waste is more helpful than practices meant to increase diversion. It is also important to demonstrate, where it occurs, any direct relationship between waste reduction practices and cost saving potential for small business.

NRES has educated Little Star about avoiding EPR waste, about on-site composting, and has provided connections to composting and reuse programs to avoid garbage disposal. Well Beings daycare manages EPR waste correctly by sending residential packaging, that comes from the home, back to the home. Garbage continues to be an issue for both daycares, as any large bin service is too costly.

Little Star daycare has no collection service: recycling and garbage is transported by staff to an affiliated daycare which has commercial garbage and recycling bins. Previous practice of recycling business waste in residential curbside bins has been exchanged for recycling small amounts of Recycle BC waste as commercial waste. The business is satisfied with their current practice, but has also been advised by NRES that Waste Connections may be able to implement tote pick up service at their business.

Methodologies for change

For a business to achieve 90% waste diversion, diversion options must exist and be identified. Where traditional or local diversion options no longer exist, it becomes essential to implement

1. adjustments to achieve Reduce and Reuse,
2. alternative options for diversion, and
3. new re-processing technologies as they become available.

NRES pilots were designed to achieve each of these goals.

Waste Diversion and Reduction Pilot Projects

NRES ICI diversion pilots are designed to prepare the sector for new RDN bylaws. Given the challenges to diversion within the recycling and hauling systems, it seems productive to promote new solutions for waste within the ICI sector. In order to help create new diversion streams, NRES has created 4 pilot projects to create new solutions.

Pilots were initiated from reported and investigated service gaps. Where no service exists, extensive research and knowledge of sustainable solutions is necessary. Often when there is no existing service template, the customer/waste audit participant knows only the problem. The cause of the problem within the system has to be explained several times to various parties who have no experience or interest in waste. In times of high demand on overwhelmed and understaffed businesses, even when free help is offered for some imperceptible solution, it doesn't look free. And, when cheaper and more convenient options for garbage continue to loom, pilots are not only extremely difficult to get off the ground, they hang by a thread throughout.

Creating and testing new diversion streams is excruciatingly laborious, and tend to highlight several systemic barriers.

Processors: Even where processors or re-processors exist, they seldom understand the waste stream. Existing processing options favour clean, post-industrial materials. Processors prefer profit, and profit margins from waste stream and hard to recycle materials are tenuous at best. Also, it's not simple to change templates at a plant from one that processes pristine post-industrial to one that processes contaminated waste stream material like bale wrap. Testing to achieve a working profit model takes multiple attempts.

Collection and transport: When something hasn't been recycled before, like bale wrap, people treat it like garbage and so collection site participants need significant coaching. In addition, no transport businesses exist to manage, sort, reject, educate, and transport small amounts of materials for recycling. Hiring from the junk removal industry is too expensive, and hiring the "person with truck" hires a driver with no knowledge of recycling. For this reason, NRES accompanied the bale wrap hauler, accompanied all construction pilot hauls, and actually provided the collection, sorting, weighing, and hauling for the CESA project as there were no workable alternatives.

Pilot sites. The CESA and farm plastic pilots added 20 participant sites to the NRES ICI diversion project. Each site participant required some education of the problem, the potential for a solution, and what the pilot can achieve. In the case of the CESA pilot, explaining a potential solution first required explaining the root of the problem. The participants had no knowledge of EPR, and so did not consider EPR inclusion as a potential solution to their recycling challenges with unsold products. Understanding EPR is not a 5-minute discussion, but necessary to grasp for a successful pilot.

Some pilot site participants had exhausted previous attempts to recycle or otherwise manage their waste and were in no mood to start something new. Pilots take more work than putting waste in the garbage, and participants did not have the expertise to know if a pilot solution might be a permanent and sustainable solution.

Covid increasingly complicated pilot uptake as pandemic fatigue became a factor. Making contact, organizing zoom meetings, having limited access to sites, communicating through masks, and generally increased anxiety amongst workers created additional barriers to an already challenging task.

And finally, garbage competed with pilots because it's easier than any and every step along the way throughout, and loomed when barriers or problems arose.

ICI participants in pilot projects show high diversion success. Participants with lower diversion success were identified for pilots that time and funding could not support. For example, a smaller hauler recycling collection pilot designed for SME recycling, and further testing phases of the plastic processing pilot would have increased diversion for these participants, but funding reductions and time prohibited additional pilots. These participants were not enthusiastic about following their plans without engagement and support from NRES. One reported, "whatever you can do for me, I'm 100% in."

Avoiding EPR waste

As ICI is not (for the most part) included in EPR recycling programs, the sector does not receive EPR education. For this reason, ICI continues to erroneously manage EPR waste. NRES provided education to the Beacon and Little Star Daycare to identify RBC consumer packaging and to ensure it remains in the correct stream. The CESA pilot highlighted large-scale systemic mis-management of EPR waste.

The problem persists with installation and delivery businesses, and many other businesses throughout the ICI sector.

NRES engaged with a delivery business to gather additional data about delivery industry practices that violate EPR regulations. The organization experienced a management change, and time and budget constraints did not permit starting over with a new manager.

Education and Coaching

NRES education for the ICI sector is designed to promote change.

It is one thing to teach participants about proposed bylaws, but awareness training falls short of the goal to prepare the ICI sector to innovate. Use of problem-based learning in the pilots

- allowed each participant to create their own path to innovations,
- integrate sector changes with sector practices, and
- allowed participants to take charge of reducing their waste as an alternative to subjugating their business practice and reputation to the constraints of hauling practices.

This type of education takes time, but the result is sustained learning and skill-building necessary for future innovation.

In addition to problem-based learning opportunities, NRES provided traditional instructive education and coaching as indicated and needed to encourage progress with plan implementation; however, it is

unproductive to expect results from education alone. It's not surprising, therefore, that education alone did not pave the way for businesses to implement their plans.

Observations from waste diversion plan implementation.

1. The costly model of providing separate bins for recycling and garbage does not ensure successful diversion. Bins alone are insufficient infrastructure.
2. Participants engaged with problem-based learning pilots showed highest diversion outcomes.
3. The common misperception that everything is recyclable persists. Various messaging misleads ICI customers; for example, recycling service websites quote recycling rates for non-recyclable materials.
4. Businesses are highly focused on recycling, even when options don't exist. Reduce and reuse were seldom considered unless NRES suggested or provided the service in a pilot.
5. Self-hauling as a solution to insufficient collection service has largely been abandoned and replaced with garbage options.
6. ICI participants continue to give up.
7. Correct but costly time/space/labour prohibitive solutions had low participant uptake.
8. NRES was often the first to inform participants about regulations, for-profit waste systems, options and correct practice for ICI.

Persistent Complex and Systemic Barriers

Hauling industry practices and barriers:

The 2020 Waste Audit report identified some hauler practices as barriers to diversion.

It is true that most waste haulers depend on dropping, filling, and hauling large bins to one location. Large bins can promote mixed waste and garbage collection, can be cost prohibitive for the SME sector, and ultimately provide lower diversion potential than a model using small, single product bins. NRES pilots achieved diversion using the smaller hauler model. When asked about potential for adding smaller hauler services for a pilot project, or for small businesses in general, one hauler stated "I have no interest in changing our model."

As most haulers use large bins for garbage and recycling collection, service to promote small tote collection is rare: from 2020 to 2022, SME waste audit participants report no success getting commercial recyclers to answer calls for collection of small amounts of recycling. In 2022, NRES research has resulted in one quote for garbage and recycling tote pick-up services at \$31.00 per month, and another quote, from the same company and for the same service, at \$80.45 per month. Inconsistent customer service remains a barrier.

Haulers offer mixed bins to customers at 2 to 3 times the price of source separated bins but, in times of unprecedented waste collection demand, efficiency of the mixed bin overrides the added cost to the customer. As the RDN 2021 "Financial Implication of Mandatory Waste Source Separation" document explains, "The single stream waste model amounts to large volumes of landfilled waste that could be recycled or composted." Profit and efficiencies are driving practice.

Given the conclusion in the document, "As collection fees are dependent upon material type, separating materials into three streams is expected to result in lower user fees, and will simultaneously result in more diversion of recyclable and compostable materials from the landfill" it is a puzzle that haulers offer the mixed bin.

The culture of big bin hauling remains confusing for customers. A customer concerned with sustainable diversion can be told products are “recycled” but often can’t get information about whether that recycling is the crush and fill pot-holes process, or actual recycling into a usable product. Asphalt and rubble are typically crushed and used to fill pot-holes on haulers’ property, and this is not what recycling means to the customer. Detailed questioning about final destination often does not bring favourable results.

Innovative pilots can’t be done using existing hauling practices because of the need to collect and transport small amounts of materials to a number of location. This is surprising, considering the sorting and hauling of small amounts of materials to various locations is the exact service required for successful diversion of garbage and recycling from a small business. NRES found no access to metal bins smaller than 25 yards.

Hauler practices that continue to circumvent bylaws and bans, confuse customers, and continue to thwart attempts to educate the ICI sector about sustainable diversion.

Haulers can add and subtract accepted materials at any time, and so there is no consistent picture for the ICI customer.

Self-haul: lack of service-lack of diversion

The 202 Waste Audit reports confirms that some businesses will always self-haul, and some businesses are left to self-haul because their waste haulers now recyclable products, and because local commercial recyclers are not responding to calls for service.

The 2020 NRES Waste Audit report to the RDN recommended increasing self-haul capacity of the Church Road and Cedar Road programs. RDN staff report indicates no action will be taken to increase self-haul drop-off convenience for businesses.

Self-haul of ICI recycling has largely been abandoned by waste audit participants. Previously self-hauled material was reported as now being placed in garbage: new bylaws are not predicted to change this outcome.

General Conclusions

It’s not enough to want to do better. ICI needs a system they understand and a system that works for successful diversion under new bylaws.

The stated purpose of the Waste Hauler License bylaw is to “promote the ‘business of diversion’ and foster industry innovation.” New RDN bylaws are designed to drive waste feedstock to new and innovative recycling and re-processing infrastructure that doesn’t exist in the RDN today, and will take time to develop. The question of who leads the way to innovation remains.

As the RDN notes in the Ruben Anderson report from 2011, infrastructure is needed for diversion. Collection bins, haulers, and secondary and end-market processors/re-processors and consumer markets are that infrastructure for recycling. Reuse needs a similar infrastructure chain.

Gaps in infrastructure create gridlock, for example, all ICI participants with bins have separate bins for recycling and garbage, and go to great lengths to source separate all their recycling. But they can’t get

their source separated recycling collected because haulers refuse all but cardboard. So they pay for a bin, resort to self-haul, while they pay for an empty recycling bin.

Haulers drive trucks loaded with material to a location for profit. The successful business model is to work within and around systems to create the most profit. To date, ICI Diversion project indicates that the hauling industry has not shown substantial adaptation to diversion needs of small business or single product zero-waste recycling, to education needs of customers, to weather or contamination threats to product, to customer service and dispatch requests, or to the environmental emergency of climate change. And, they are not showing interest in change. As the Ruben Anderson report states, “it [Waste Hauler License] makes the haulers responsible for the infrastructure.” Hauler adaptation to bylaws remains uncertain.

The waste industry has yet to create sufficient innovative infrastructure, as evidenced by the report,

- “I’ve been in business since 1992. I have 5 times the waste and nothing has changed. In 1996, they picked up cardboard. In 2020, they pick up cardboard.”

Hauling practices challenge the definition of recyclable, yet the definition is integral to successful ICI diversion under the new bylaws. The RDN supports the EMA definition of recyclable as dependent on existence of a commercial market. When local haulers and processors abandon recycling streams because of market pricing challenges, the vague definition of “recyclable” is challenged. At what point does a product then become defined by local haulers as non-recyclable, and therefore acceptable as garbage in the RDN landfill? Commercial plastic film has achieved this status now in the RDN, yet clear film is highly recyclable and valuable as a clean, baled product in Metro Vancouver. It is uncertain how ICI will manage this product when their haulers won’t. Definitions of compostable may also be challenged.

ICI diversion continues to emphasize recycling, and specifically recycling tonnage. Tonnage diversion targets are a low bar, especially in the Construction, Renovation, and Demolition sector. More importantly, increasingly watered-down recycling definitions (across the industry) include simply crushing products to fill land: in 2021, crushing and filling land with a product should not be considered “recycling.” Also, re-purposing wood to burn as alternative/sustainable fuel does not comply with the RDN Solid Waste Management Plan zero waste definition and hierarchy.

There is a strong case for continuing to help ICI investigate and create innovative solutions through pilot programs in which participants create sector specific solutions that are actually possible.

This is not without challenges. ICI is not positioned to take on management of recycling streams abandoned by the waste industry. Participants reported not having expertise to implement waste diversion or reduction and procurement programs. Cost and time constraints also limit ability to change practices.

Questions remain unanswered for participants,

- “I’m a builder. Design change starts with architects. Tell me what to do right now.”
- “I’m a dentist, I can’t spend this kind of time on recycling.”

Yet these businesses persist trying to innovate and do better. They are willing to meet obligations of sorting and diverting. At that point, they are looking for the hand-off to recycling or waste innovators. It isn’t clear that this integration will happen spontaneously.

Changes and innovation needed for successful ICI diversion from new bylaws are in the for-profit sector. Early NRES proposals to partner with for-profit haulers and recyclers on innovative projects were not approved, and funding is available only to the non-profit sector. Barriers to innovation and diversion therefore persist in the for-profit sector.

It's fair to question whether targets for diversion of endless amounts of plastic and other non-recyclable products promote lowest common denominator management from expectations to outstrip ever increasing garbage tonnages. The perception of diversion as success can be misleading.

It's fair to ask if there is actual capacity and technology for the innovation required to manage overwhelming and increasing amounts of waste. This can be considered a global over-production trend that unfairly challenges local waste management players and plans. However, until innovative businesses exist, it is uncertain how haulers, and therefore their ICI customers, will manage recycling beyond cardboard (and wood, asphalt, rubble, and metal in the C and D sector).

Appendix A
Waste Audit Participants

Norm's Blinds Installation
2509 Rosstown Rd, Nanaimo, BC

Stellar Bay Shellfish
7400 Island Hwy W, Bowser, BC

Tectonica Management, Inc
890 Crace St, Nanaimo, BC

Flying Fish
18- Commercial St, Nanaimo, BC

Wenner Group
#101 – 1934 Boxwood Rd, Nanaimo BC

NRGH-Housekeeping Department
1200, Dufferin Crescent, Nanaimo, BC

Kiwanis Senior's Village
1233 Kiwanis Crescent, Nanaimo, BC

Little Star Children's Centre
600 Beach Dr, Qualicum Beach, BC

Franklyn Street Dental Centre
450 Franklyn St, Nanaimo, BC

Springford Farms
1934 NW Bay Rd, Nanoose Bay, BC

Green Glen Farms
3110 Alberni Hwy, Qualicum Beach, BC

Big Wheel Burger
601 Bruce Ave, Nanaimo, BC

Friends of Haven Thrift Shop
451 Albert St, Nanaimo, BC

The Beacon
154 Promenade Dr, Nanaimo, BC

Well Beings Daycare
31 Lebarz Rd, Nanaimo, BC

Nanaimo Recycling Exchange Society

ICI Waste Audit Project Report

Prepared for: Tectonica Management
Prepared by: Jan Hastings, Executive Director
Contact: Jan Hastings jan@recycling.bc.ca

Waste Categories Identified in your Waste Audit

Fibres: Cardboard, Boxboard, Paper

Plastic Containers: HDPE

Plastic Film: Clear, Shrink-wrap, Bubble-wrap, Coloured

Stryrofoam: White packaging

Scrap Metal: Ferrous and Non-Ferrous

PVC and ABS Plastic Pipe

Managing your waste

The RDN considers waste from businesses to be entirely different from residential or curbside waste. The main differences can be summarized:

1. Residential and curbside waste is managed by the RDN or City of Nanaimo.
2. Industrial, Commercial, or Institutional waste is managed by the private sector. Your business can select from several private sector waste haulers, who provide a variety of services.
 - a. It is important to know that ICI waste is not included in curbside or residential waste collection services.
 - b. It is important to know there are no industry standards for private sector garbage and recycling collection: your service is based on the business model of your waste hauler. Your hauler is not required to recycle, but should know the regulatory landfill bans and bylaws where they tip your recycling or your garbage.

Manage your waste according to bylaws, landfill bans, and the waste hierarchy

There are Solid Waste bylaws and landfill bans that govern solid waste in the RDN. In addition, the RDN has adopted the Zero Waste International Alliance waste hierarchy for waste management.

RDN Bylaws:

There are bylaws that govern waste from businesses: these bylaws will likely change in 2022.

Bylaw 1802

Bylaw1386

Bylaw 1784

You can read the bylaws at <https://www.rdn.bc.ca/regulatory-bylaws>

RDN landfill bans include

Commercial Organic Waste
Compressed Gas Containers
Corrugated Cardboard

Garden Waste
Gypsum
Metal
Recyclable Paper

Recyclable Plastic Containers
Stewardship Materials

Recyclable materials delivered in Roll-off bins or a volume greater than 3 cubic meters

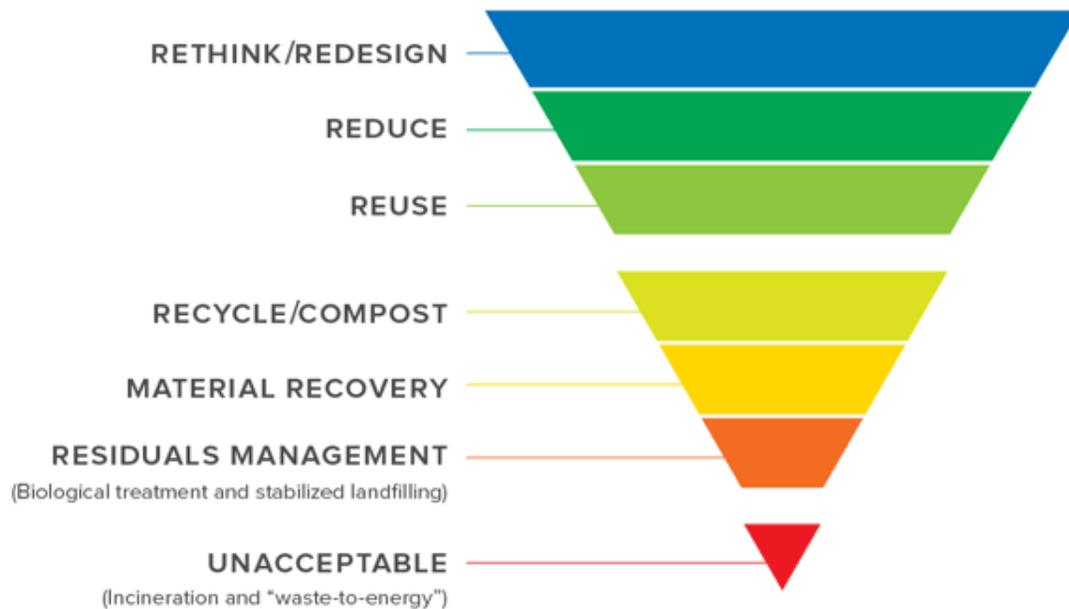
Wood Waste
Tires

The RDN has adopted this Zero Waste Hierarchy

Start at the top of the Hierarchy.

Only select choices below when you have exhausted the step above.

THE ZERO WASTE HIERARCHY 7.0



© Zero Waste International Alliance zwia.org/zwih

Because the private sector haulers provide limited recycling options for ICI, reducing waste takes priority. This means all businesses must focus on the blue and green top sections of the hierarchy to reduce waste.

Using the waste hierarchy.

Rethink / ReDesign. Be aware of and discourage systems that drive needless consumption. Purchase products from reused, recycled or sustainably harvested renewable, non-toxic materials to be durable, repairable, reusable, fully recyclable or compostable and easily disassembled.

What can Tectonica manage by re-thinking every process that results in waste?

1. Consider how to influence all processes, from planning and design through de-construction and construction, that could reduce material use and waste.
2. Prioritize minimalist function over high-end show. Create adaptive models. Consider biomimicry.
3. Make a Zero Waste policy with procedures, using the hierarchy. Instead of treating waste as an afterthought, what can you do to prevent it?
4. Incorporate the policy in to everyday practice, from board to tailgate meetings to make best practices the new normal.
5. Communicate your Zero Waste goals. Your investors and suppliers should know you are trying to incorporate sustainability into your business procurement and production. Sustainability is strong marketing incentive.

Reduce

Plan consumption and purchasing to minimize discards.

Choose products that maximize usable lifespan and opportunities for continuous reuse.

1. Are the products Tectonica uses sustainable?
 - a. Research sustainable construction materials. For example, Xano Grass products: MDF, OSB, Particle board made without resins that are perpetually recyclable. Company is Hexas in Washington State. wowens@hexas.com
2. Plan to use surplus materials like off-cuts. Showcase it in feature walls as selling feature. Promote as zero waste.
3. Consider different models: tiny-house villages, more mixed zoning for new “work from home” capacity, ways to incorporate moved houses into a development, modular incremental affordable building.
4. Reduce footprint of land: preserve natural systems and biodiversity.
5. What is your budget for wood waste on a project?
 - a. How could you re-direct that money to use that wood as a resource?
 - b. Repeat process for all budgets for waste, especially plastic and fibres.
6. Use the NRE as a resource for ways to create value from “waste”.
7. Revise practices for servicing residential renovation jobs. Residential packaging managed by Recycle BC can be left at residential address to be collected at curbside.

Reuse

Maximize Reuse of materials and products. Maintain, repair, or refurbish. Dismantle and conserve spare parts for repairing and maintaining products still in use. Re-purpose parts for alternative uses.

1. Consider building for the un-build/re-build. Re-think potential for Tectonica built structures. Consider designing for the life-cycle, with incremental add-ons or upgrades, or downsize capability. Consider the service model applied to housing construction to avoid need for demolition or major deconstruction.
2. Choose durable and repairable systems for installations.
3. Consider forming a reuse network for transfer of reusable materials from sites. Social enterprise work training programs are potential partners.

Recycle

Ensure materials are put back into the materials cycle. Procure items with recycled content to ensure longevity of recycling services.

Tectonica's recyclable cardboard, paper, and plastic containers were collected as contaminated garbage. Milner confirms plastic goes to landfill. Try to increase recycling of products that can't be reused.

1. Consult your hauling contract re: paper and plastic items you need recycled.
2. **Recyclable cardboard and paper:** is banned from the RDN landfill. Separate these products to avoid contamination.
3. **Plastic containers:** are banned from the RDN landfill. Consider calling Waste Connections for a bin to collect mixed recycling that includes plastic containers.
4. **Plastic containers, paper and cardboard, film:** Call Cascades at 250 883-7106 to see if self-haul is possible to recycle these products. Record response and report to NRES for further instructions.
5. **Styrofoam:** Call Styro-Go at (587) 890-1140 to arrange Styrofoam recycling
6. **Self-haul options:**
 - a. Clear plastic film Parkville Bottle and Recycling Depot will accept, at no charge, shrink wrap, bubble wrap and other clear soft plastic.
 - b. Mixed recycling can be hauled to Cedar Landfill or Church Rd transfer station.
 - c. Metal: ferrous and non-ferrous can be hauled to ABC. Tectonica can discuss benefits of high grading non-ferrous for revenue.
7. Discuss options with NRES for
 - a. OCC Shredding (used on local farms)
 - b. Dimensional lumber end-cut use on the project
 - c. Plastic re-processing (waste from project re-processed for use on same project: example HDPE to cabinet hardware, decorative electrical wall plates)

Materials Recovery

Maximize materials recovery from mixed discards and research purposes after extensive source separation.

Only applies to materials being composted

Residuals Management

Examining materials that remain and use this information to refine the systems to rethink, reduce, reuse, and recycle in order to prevent further discards. Encourage preservation of resources

What's left in your waste stream? Can you change procurement to eliminate it?

Who is managing your landfill to ensure residuals have no other option.

Unacceptable: It is no longer acceptable to support policies and systems that encourage destructive disposal for any material. Don't support systems that depend on continued production of discards or produce toxic discards (incineration).

Examples are multi-laminate or "flexible" plastics, contaminated or soiled items, and any products that can't be recycled.

Nanaimo Recycling Exchange Society appreciates your participation in this waste audit.

Tectonica Management is successfully managing some of the categories, and we have noted the categories that are problematic. Barriers you described to us have been reported to the RDN with our recommendations for increased support for businesses.

This report is for your use. We hope it gives you options for recycling your waste. More importantly, we hope it helps you prevent waste to reduce the burden and costs of waste management.

We will contact you to help implement options in the plan. This plan will adapt as options are tested, or as pilot projects are implemented to manage your waste.

We hope you publicize your commitment and progress, as sustainability has become an important marketing tool.

Appendix C
Source Separation Centre at Construction Site



Appendix D
Dimensional Lumber from Unbuild—Still going after 3rd use



Appendix E
Beacon Reduce/Reuse Supplemental Plan

The Beacon – Concepts for Reducing Waste

NRES and the Beacon have formed a waste audit plan committee to plan and implement the following programs. The committee includes representatives from the Gabriola and the Newcastle residences as they also want to learn and participate. Education days are planned for 2022.

- 1) EPR- packaging
 - a) Education
Correct practice of refusing packaging that arrives by delivery services. This change does not reduce packaging, but it ensures recycling of the packaging within the correct stream.
- 2) Strategies to reduce packaging
 - a) Local farmed food delivery
 - i) Nanaimo Farmers Market online (delivery each week)
<https://nanaimofarmersmarketonline.ca/collections/veggies>
 - ii) Gabriola Agricultural Co-op online market (negotiating delivery to Beacon, TBA)
<https://gabriolaagriculturalcoop.ca/on-line-farmers-market/>
 - iii) Cowichan Cow-op Farmers online market (will deliver to Nanaimo each week)
<https://cow-op.ca/>
 - iv) Foodshare (gleaning, sharing, cooking, and preserving programs)
<https://nanaimofoodshare.ca/our-programs/>
 - b) Food delivery alternatives
 - i) Reusables VI
<https://reusablesvi.com/>
 - ii) Resident shopping and Beacon services procurement alternatives
 - (1) VI Refillery
<https://www.virefillery.ca/>
 - (2) Beacon on-site refillery for residents and site services
 - (3) Refill shopping (Avalon Dairy)
 - c) Other resource examples
 - i) Beeswax and mesh bags; other examples of sustainable food storage
 - ii) Zero Waste Nanaimo facebook resource page
<https://www.facebook.com/groups/471695459607398>

- iii) Canada Post Junk Mail refusal
<https://www.canadapost-postescanada.ca/cpc/en/support/kb/receiving/mail-delivery/how-to-stop-receiving-advertising-mail>
- d) Dedicated sharing place and programs
 - i) Beacon spaces available for sharing
 - (1) Central food delivery and pick up for residents
 - (2) Refillery space for cleaning products, other products?
 - (3) Pick up location for Reusable services
 - (4) Lending library (for books, tools, household appliances)
 - ii) eV Plug ins (CleanBC/BC Hydro)
 - (1) Currently researching procedures and potential for electric car charging stations in Beacon car park with sub-committee
 - iii) Car share program (EV and traditional)

Appendix F
Participant Farms Collecting Bale Wrap

1. Whittaker Hobby Farm- 2 locations
2. Heart of the Valley Farms
3. Mikerri Farms
4. Ridgewood Farms
5. Circle M Farm
6. Alder Mountain Farm
7. Green Glen Farms
8. French Creek Valley Farms
9. Springford Farm
10. Northwest Bay Ranch, Kim