Reduce, Reuse, Rewear: Part Two

The Textile Secondary Market in Canada

Summary Report and Key Findings

Supplementary document to the previously released Reduce Reuse, Rewear paper of January 2023

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Report Objective

Commissioned by NACTR, with the support of Environment and Climate Change Canada, this study's objective was to evaluate post-consumer textile waste management system's lost opportunities from economic, environmental, and societal impact perspective of textile reuse. Components of this study include a material and economic flow analysis to identify pinch points and an infrastructure gap analysis of collection and recovery.

Textiles can be defined as, used, or new clothes, accessories, footwear and other 'portable' textiles, such as home textiles and soft toys, no longer needed or wanted by residents. These will be referred to as post-consumer textiles. Note that this does not include textiles in furniture or mattresses.

Municipalities are the intended audience for this report as they control key portions of the collection infrastructure and have the capacity to enable and support the development of textile recovery systems. They also have a strong role in public messaging about how to ensure that no-longer-wanted textiles are diverted towards reuse operators.

This report is designed to offer fact-based direction for increasing post-consumer textile waste diversion from landfill across Canada.

Textile Diversion: It's Only Just Begun

The management of textile diversion in Canada is underdeveloped. A recent study commissioned by Environment and Climate Change Canada [(1)] estimated that of the 1.3 million tonnes of used/waste apparel generated in Canada each year, 24% (250,000 tonnes) are diverted to reuse/downcycling with downgrading of material value. For over 100 years in Canada, this responsibility has primarily fallen on the charity sector, with the management of post-consumer textile waste streams.

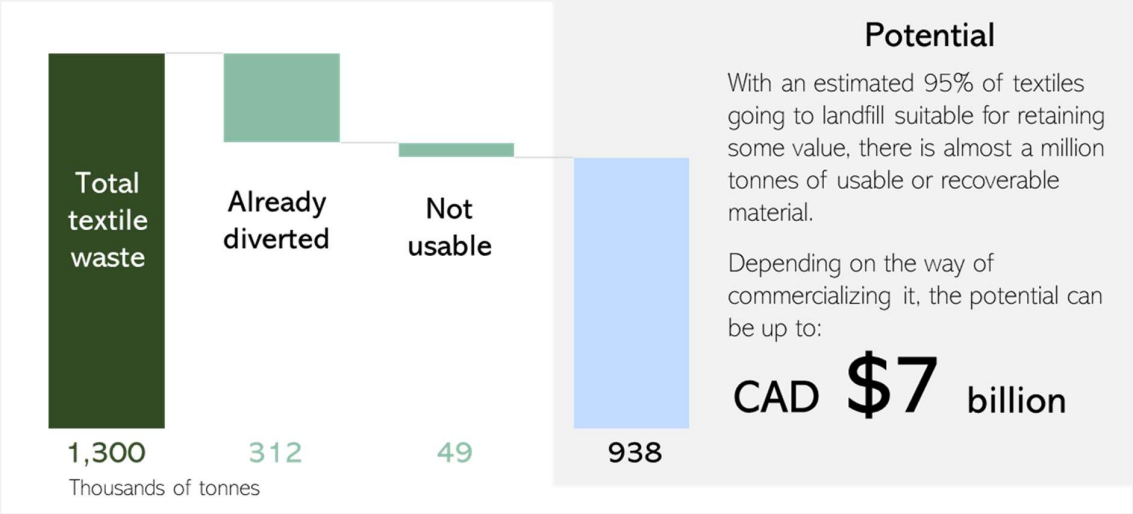

Figure 1: Gross maximum potential of reused textiles in Canada

Figure 1 illustrates the unconstrained potential for reuse, although more moderate views of the potential still yield exciting possibilities. Uncollected textiles represent a significant lost financial opportunity: commercializing textile reuse to its full extent could be worth up to CAD $7 billion per annum. Some other headline findings from the study of flows underpinning this report are:

- **Repairing or cleaning**, the research suggests that there are circa 96,000 tonnes of post-consumer textiles that hold value if properly laundered or had minor repairs, and for which there is no evidence that these activities are taken on systematically by any market actor. If these are valued at CAD $5 per kilogram (or 20% of the estimated price per kg in stores), they could have a valuation of over CAD $480 million.

- **Missed collections**, findings suggest that Canada's current textile diversion rate is around 24% (see Appendix A). The UK, a comparable economy with a more mature post-consumer textile market, shows a diversion rate of over 50%. If collection rates in Canada were to increase to match those levels, the additional textiles would represent a value of more than CAD $230 million in the most conservative case.
- **Increased employment**, the addition of the above flows into the existing post-consumer textile infrastructure would inevitably result in the need for more processing and sales jobs. For context, the current 43,000 tonnes sold in stores calculated in the study, represent around 8,400 jobs for retailers. An additional 290,000 tonnes would potentially translate to tens of thousands of jobs in retail, sorting/grading, collecting, and other processing activities.

Beyond Economics

We are entering an age where the circular use of products and resources is central to our efforts to insulate ourselves, and the planet, from harmful greenhouse gas emissions and supply chain risks while maintaining high-value economies with enriching jobs. In terms of other environmental impacts, associated greenhouse gas savings could be over 30 million tonnes per annum through avoided textile manufacture.

Textile Diversion Actors

Textiles is a complex landscape with numerous types of operators, with flows of materials into, out of and between them. For the purposes of this study, the major flows and operator landscape has been simplified without losing sight of the essentials as shown below.

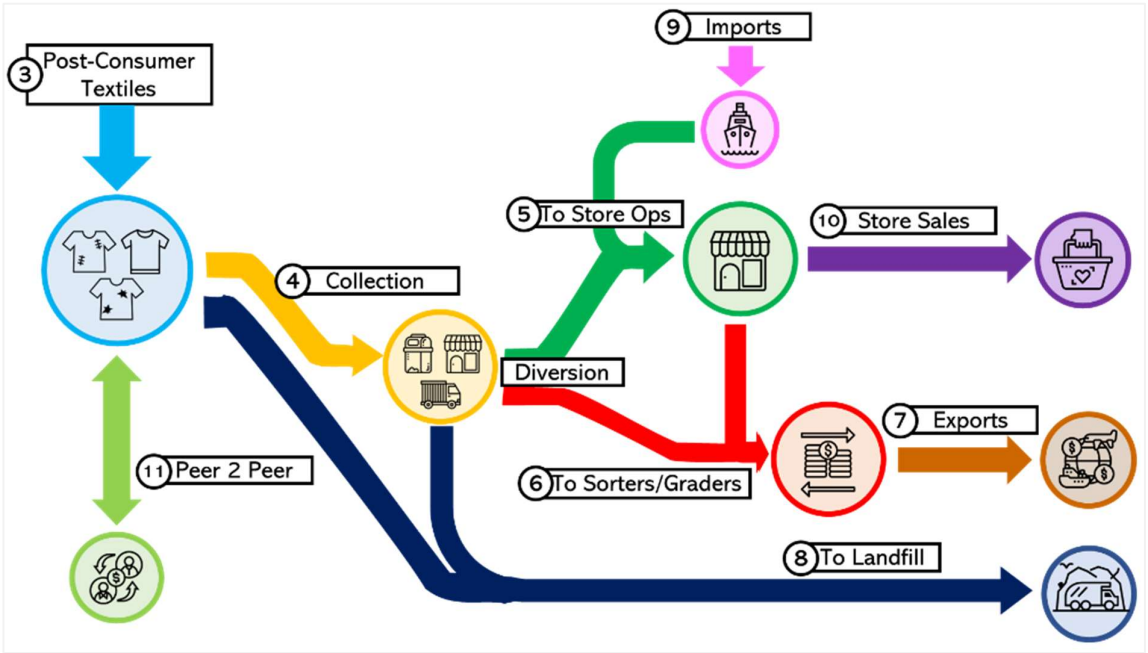

Figure 2: Flows of used textiles between key actors
Note: Numbers associated with flows indicate the relevant section of Appendix A.

Used textiles flow from consumers disposing of their textiles or having them collected in the top left; through various stages of triage, sorting and segregation at municipal sites, dedicated store operations, or sorters and graders; to either being resold, exported or landfilled. Imports are a significant addition to the mass to be processed, and peer-to-peer (p2p) exchanges are an important means of extending the life of textiles.

Flows of Textiles to Reuse

Figure 3 summarizes the key findings from the supporting report on the material and economic flows of post-consumer textiles in Canada (see Appendix A). With uncertainty in data, the graphic shows the central estimate.

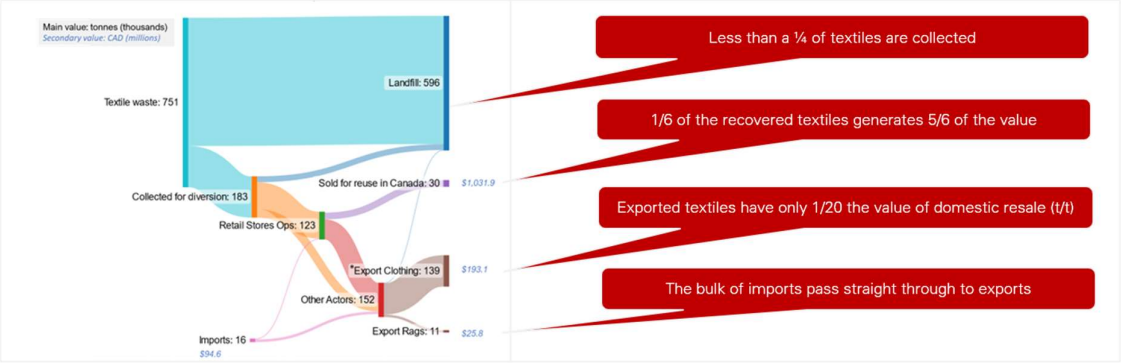

Figure 3: Summary of economic flows and the central estimates of the flow of post-consumer textiles in Canada
Note: In the central estimate scenario, the figure of 139 thousand tonnes of clothing exported is a balance of the other flows.

Recommendations to Reduce Textile Waste to Landfill, Four Focus Areas

To achieve this, it is important to educate people about the issues of overconsumption and the need for diverting waste from landfills. Encouraging consumers to make smarter shopping choices can help tackle overconsumption. However, reducing textile waste also requires the implementation of physical infrastructure and active involvement from consumers in landfill diversion and recovery efforts. These initiatives involve partnerships across stakeholder groups in the secondary textile sector, ensuring a greater impact through resource sharing and enhanced innovation. To build this capacity, stakeholders should focus on four key areas.

FOCUS 1: Establish a common front and standards to improve operator effectiveness is key to enabling stakeholders to work together more effectively. Increased collaboration and accountability across the value chain is necessary to raise the bar on the quality (level of sorting applied and proportion of reusable textiles)

Key Recommendations:

- **Disseminate learning to enable adoption of best practices across municipalities and charities.**
- **Increase visibility** of collection points and public education about the benefits of donation.
- **Adopt standards and minimum requirements** across leading collectors to create competitive advantages for downstream operators. Partnerships and collaboration, particularly with municipal authorities, could drive more transparency on sorting/grading and exporting processes.

FOCUS 2: Improve the Textile Data quality and transparency for better action targeting.

Improving the quality and transparency of post-consumer textile trade: whilst acknowledging the role of post-consumer textiles as a globally traded commodity, and transparency (on the downstream impact and material end fates) of textile exports from Canada.

Key Recommendations:

The following recommendations require the cooperation and collaboration of national and provincial data collection agencies.

- **Track textile waste disposal and diversion separately.** Statistics Canada's decision to include textile waste diversion in the Waste Management Industry Surveys since 2018 is commendable. A similar approach to establish a national baseline for textile disposal and diversion figures would enhance the accuracy of evaluating the impact of textile waste diversion efforts and the growth of the secondary textile industry.
- **Establish a common framework of definitions, product classification, and waste sampling/auditing methodology.** The literature review revealed a lack of harmonized framework for classifying and characterizing post-consumer textiles. Municipal, regional and provincial governments could adopt NACTR's textile waste audit guidelines and definitions when conducting waste composition assessments in companies. This would assist in better identifying product hotspots to be targeted for diversion efforts. It would enable more accurate analysis of textile reuse by NACTR members as a proportion of total textile diversion handled by government and business actors.
- **Establish a common methodology for quantifying the carbon emissions of textile waste management**. Stakeholders should collaborate to ensure that future work on product life cycle assessment incorporates considerations of the emission impact from textile reuse, recycling and End-of-Life management (landfill, incineration and export). Communicating to consumers fairly and consistently that reuse has a key role in averting these impacts is core.

The following recommendation requires the financial support of municipalities so that all textile collectors and NACTR members can take action:

- **Establish a regular source of funding and program of work for waste composition and impact analysis.** NACTR membership has the opportunity to step up and establish itself as the gatekeeper to data on textile diversion. It is strongly recommended that NACTR collects quantitative textiles flow data, especially the quantities collected.

FOCUS 3: Promote charitable reuse to encourage charitable donations and spotlight circular behaviour/ initiatives/business models such as textile life extension and reuse. In addition, although the textile reuse sector is not the primary agent of change, it can play a role in reducing overconsumption; the secondary market counters overconsumption by keeping products in use for longer and displacing the need for new products.

Key Recommendations:

- Increase public action on textile waste prevention. To reach a wider audience, municipalities and charities should use a variety of different communication channels (e.g. websites, social media, local newspaper); for efficiency, regions and charity groups should explore partnerships to pool resources and achieve scale.
- Raise awareness among the public of the economic, environmental, and social impacts individuals can support. This can draw upon, for example, common messaging about greenhouse gas impacts using standardized methods as described in Focus 2.
- Promote an alternative to fast fashion through thrift, reuse, and innovative upcycling.

FOCUS 4: Improve and optimize the collection infrastructure to reduce waste going to landfill and incineration: minimize the leakage of textiles, especially reusable textiles, into the environment at every stage of the value chain – collection, sorting/grading, and export. Future focus should be on increasing collaboration between municipalities, NACTR members and other players. Further cooperation can help scale the partnership model and amplify its impact by sharing knowledge and best practices to establish new norms.

Key Recommendations:

- **Optimize current infrastructure usage:** Before decisions on building additional capacity can be made, current infrastructure performance needs to be evaluated and optimized; this can be enabled through better data collection on quantities and the quality of textiles collected at each collection point.
- **Plan to expand collection point density:** Work in partnership with municipalities to encourage donations over landfill via an expanded collection network.
- **Use a phased approach to growth:** Ensure that downstream operations are supported to grow to match an increased collection rate.

Introduction to the Appendixes

Appendix A *The Textile Secondary Market in Canada: A Material and Economic Flow Analysis* examines in detail the flows of textiles through various parties and recommends how that information may be made more current, accurate and helpful.

Appendix B *Recommendations for Developing an Infrastructure Road Map to Increase Textile Reuse for Landfill Diversion* considers the existing infrastructure, gaps in capacity or capability, how they might be filled, and by whom.

References for citations in all sections of this report appear after Appendix B.

Conventions

In the text, numbers are rounded to a maximum of 3 significant figures (or as appropriate to the precision of the context). Tables may, however, report higher significance where material is quoted from sources simply to accurately represent those sources.

Technical challenges such as varied data availability across flows/value chain actors/geographies, inconsistent methodology, and some unclear definitions are highlighted to inform future work. A classification of confidence level is assigned to each flow figure according to the following framework:

- High level of confidence: based on primary research or data from an official and audited source (e.g., organizations' annual reports, official statistics, and databases); involves limited assumptions and generalizations.
- Medium level of confidence: based on a variety of secondary data from published sources specific to the Canadian market; involves a considerable number of assumptions and generalizations.
- Low level of confidence: based on secondary data from non-Canada-specific references; involves extensive assumptions and generalizations.

Appendix A

The Textile Secondary Market in Canada: A Material and Economic Flow Analysis

Contents

Figures

Tables

1. Scope and Objectives

This section of the report presents a comprehensive analysis of the post-consumer textile market in Canada, focusing on the material and economic flows of used textiles. The analysis covers the entire value chain of the industry, providing different sources and methodologies for estimating the flows.

- Section 2, *Overview of Market Dynamics*, provides a high-level description of the market, while the 'Characterization and quantification of post-consumer textile flows' section examines the specifics. With this background, the post-consumer textile flow is described in 9 parts (Sections 3 through 11).
- Section 3 estimates the amount of post-consumer textiles generated annually in Canada to be between 750,000 and 770,000 tonnes.
- Section 4 explores the collection for diversion of textiles from landfills, estimating that between 183,000 and 260,000 tonnes of textiles are collected or diverted for reuse or recycling each year.
- Section 5 analyzes the amount of textiles received by retail store operations, estimating that between 123,000 and 174,000 tonnes of textiles are received by actors operating second-hand textile stores. Section 0 investigates the amount of textiles received by sorters, graders, processors, brokers, and exporters.
- Section 7 examines the volume of textiles exported from Canada, estimating that between 150,000 and 186,000 tonnes of textiles are exported annually.
- Section 8 explores the amount of textiles sent for end-of-life disposal, estimating that between 548,000 and 596,000 tonnes of textiles are disposed of in landfills each year, as incineration for energy recovery in Canada is minimal.
- Section 9 concludes that the quantity of textiles imported into Canada at an estimated 16,000 tonnes.
- Section 10 focuses on textiles sold in retail stores both in terms of mass and value.
- Section 11 examines the role of peer-to-peer channels, such as consignment and online platforms, in the post-consumer textile market.

2. Overview of Market Dynamics

Textiles is a complex landscape with numerous types of operators, with flows of materials into, out of and between them. For the purposes of this study, the major flows and operator landscape has been simplified without losing sight of the essentials as shown in Figure 4.

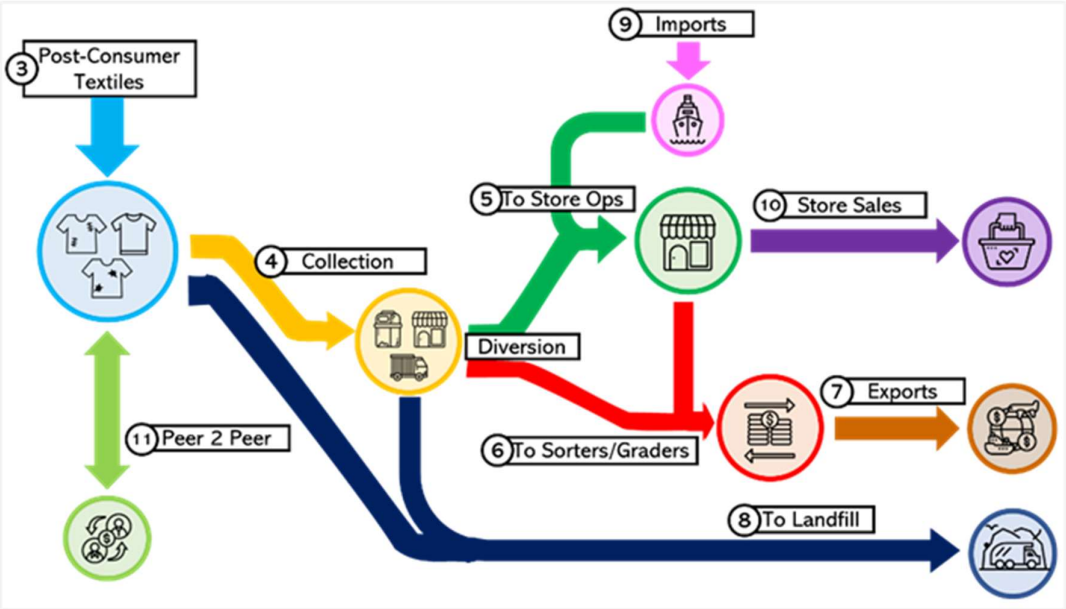

Figure 4: Key stages of post-consumer textile flow *Note: prefix numbers refer to relevant report section.*

The flow analysis starts with used clothes, accessories, footwear and other textiles (e.g., home textiles and soft toys) that the owners do not wish to keep. These will be referred to as **[3] post-consumer textiles**. From here, there are several actors who, knowing the potential value of some of these textiles, set out to divert them from the **[8] landfill** flow; this route destroys value incurs greenhouse gas and other environmental impacts through not only disposal itself, but more importantly by the creation of new replacement textiles. However, in what is known as diversion from landfill or **[4] collection**, agents prevent these suffering terminal fates. Collection in Canada occurs through mixed methods such as door-to-door collection, textile collection bins, and in-store donations, among others, and is mainly operated by charities. There are, however, some for-profit actors that also participate in this part of the market with collection operations.

The collection phase has its own subset of activities and actors, which cover from the physical collection and stockpiling of textiles, to forwarding them to the next phase in the post-consumer value chain. Before textiles are moved forward, there tends to be a first categorization for determining their possible use; this can happen at different parts in the collection phase, but it follows roughly the same pattern: Garments or pieces that are deemed unfit for the second-hand market because of their condition, are sent for end-of-life treatment, which in Canada's case is almost certainly **[8] landfill** operations [(2)]. The textiles that are considered in good enough condition for being resold are forwarded to **[5] retail store operations**; this refers to thrift stores operated by charity collectors, and those operated by for-profit collectors whose feedstock includes both individual donations and the sale of baled unsorted textiles from other charity or for-profit haulers/collectors. Finally, textiles that don't fit any of those categories (good condition of the fibers, but not desirable or wearable) are sent to what is known as **[6] sorters & graders**; these companies not only categorize the different pieces but can also undertake other activities for finding an end market for the textiles.

It would be easy to assume that the textiles that have already been classified and sent for retail store operations are mostly sold in those stores within Canada. In reality, the stores carry out a more detailed process of categorization, looking not only at the condition of garments but also all the characteristics that can make them desirable for end customers. Characteristics include local preferences, store assortment and season, contributing to a significant quantity of clothes being labelled as unfit for being sold in storefronts in Canada. Furthermore, once the textiles are put on sale, there is no guarantee that they'll be sold to customers: items are usually removed from the store if not sold within a month (depending on companies' and stores' policies) adding to the already rejected tranche. All rejects are sold in bulk to **[6] sorters & graders**. In consequence, the textiles that are **[10] sold** in the second-hand market in Canadian stores are then just a portion of that collected or diverted from landfills in Canada.

[6] sorters & graders perform a range of activities for commercializing the rest of the collected textiles. These can include further grading, processing for downcycling textiles into rags or wipes, baling bulk textiles, and all the sales and customs activities involved for **[7] exporting**, as the end markets are mostly abroad.

[9] imports of used textile form another stream of supply to the secondary market. It may be counterintuitive that used textiles are being both exported and imported, but the market has already been created for quality vintage clothing and lesser grades for processing; This market can also be fueled by branded garments collected in other countries or competitively priced rags from bigger processors abroad.

Finally, there are other market players that do not use the process or infrastructure described above because they operate in a **[11] peer-to-peer** (p2p), or customer-to-customer fashion. There are two major channels:

- Online marketplaces such as Facebook Marketplace, Kijiji and eBay.
- Consignment stores, both physical and online, where people can bring the garments they intend to sell.

Most have a similar business model, where a fee from the sale is paid to the broker or intermediary (3); However, some of the online platforms act as a classified board, relying on ad revenue instead of intermediary fees.

Modelling the textile secondary market is a complex task due to the large variety of actors involved in the different parts of the value chain. Accurate characterization of the material and economic flows is muddied by the variety of channels for post-consumer textiles, different sizes of collectors, the scope of markets that each

covers, fundamental business nature (charity/for-profit), and business models deployed. For example, within the National Association for Charitable Textile Recycling (NACTR) alone, there are charities that collect, sort/grade and operate their own thrift stores, whilst others that only collect and then sell forward to for-profit companies. Some for-profit companies, such as Value Village, have a partnership model where they use the name and goodwill of a charity partner to incentivize in-store donations which are then paid at a rate per pound to said charity; other for-profit companies have an independent collection operation.

3. Generation of Post-Consumer Textiles

The first piece of data that is relevant to analyze the Canadian post-consumer textiles market is the quantity and composition of the textiles that are both discarded from consumers and available to enter the reuse stream. Here lies the first challenge: municipal and provincial governments in Canada do not have a specific and common denomination for textile products in their waste taxonomy. Rather, in the latest national account of solid waste diversion and disposal [4], textile waste is distributed within other categories: plastics, organic materials, or other materials (see Figure 5). Although Statistics Canada began recording textile waste *diversion* from residential and non-residential sources in 2018 [5], there remains a data gap for textile waste *disposal* in the national accounts. This presents a barrier to accurately baselining or monitoring progress on the management of post-consumer textiles in Canada.

To determine the amount of post-consumer textile generated then, different data sources and methodologies have been used in the analysis below to converge towards a national estimate.

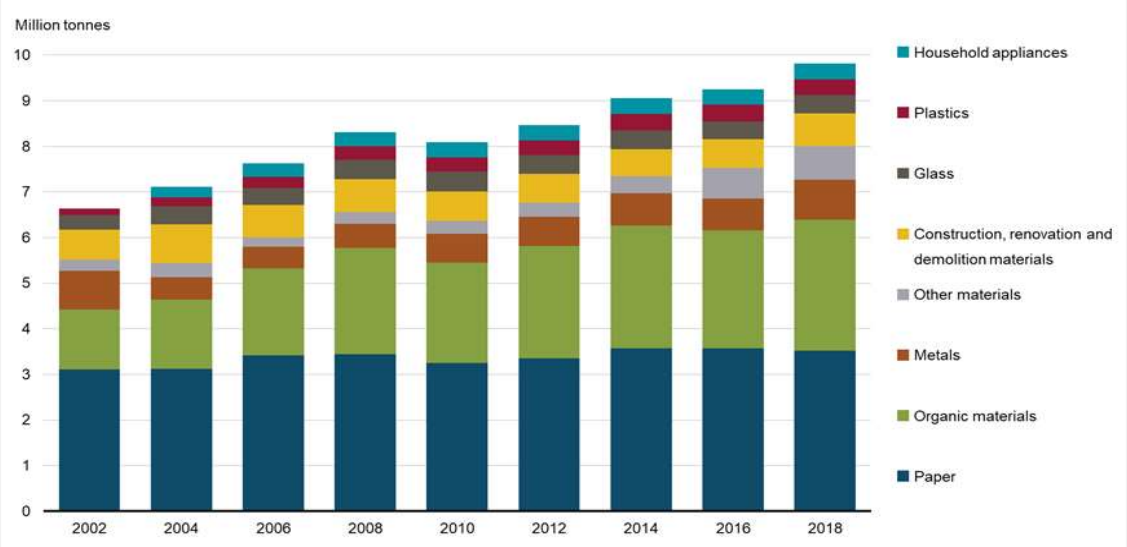

Figure 5: Solid waste diversion by type of material, Canada, 2002 to 2018 (6)

3.1. Extrapolation from the generation of plastics waste and the share of plastic content in textiles

Plastic (as a material category) is more consistently tracked than textile (as a product category of mixed materials) in the waste stream. In the 2019 report *Economic Study of the Canadian Plastic Industry, Markets and Waste* [7] commissioned by Environment and Climate Change Canada (ECCC), it is stated that plastic waste from textiles amounted to 235,000 tonnes, derived from the Canadian economy data in 2016 and custom-developed models. However, this figure leaves out a significant proportion of textile products manufactured from natural fibers or blends containing natural fibers; and it also includes carpets, rugs and mats that are excluded from NACTR's definition of post-consumer textile waste. The figure above therefore requires significant interrogation and processing to yield numbers for the textile fraction of interest to this study.

The classification of post-consumer textile waste in this study differs from the other sources reviewed; rather, it uses the classification of the *Canadian Economy Supply, Use and Input-Output Tables* [5] curated by Statistics Canada. It covers 7 broad categories:

- Fabrics.
- Carpets, rugs and mats.
- Other textile furnishings.
- Textile products, not elsewhere classified.
- Men's, women's, boys' and girls' clothing.
- Footwear.
- Artificial and synthetic fibers and filaments.

The 2022 study by Weber et al. *Textile waste in Ontario, Canada: Opportunities for reuse and recycling* [8] was used as a basis for estimating the percentage of plastic in textile waste. This study looked at a sample of over 6,800 households across different seasons to study the composition of textile waste. It found that 66.3% of the textiles analyzed were plastic-based, showing an almost equal distribution in synthetic materials and blends containing some natural and some synthetic fibers. The issue with these blends is that they are not easily separated, meaning that the whole garment is usually managed as plastic waste. Therefore, if 66.3% of textile waste equals the 235,000 tonnes of plastic waste due to textiles, the balance of 33.7% would equate to 120,000 tonnes, so giving a total of 355,000 tonnes of textile waste across all 7 categories generated in 2019. Finally, modelling by the authors of the ECCC report estimated the weight fraction of carpets, rugs and mats in textiles to be 6%. Subtracting this element from the total of 355,000 tonnes yields a figure of 333,000 tonnes of post-consumer textile waste in 2016 according to NACTR definition.

3.2. Estimates based on non-hazardous residential waste sampling in Ontario municipalities

In their study, Weber et al., in partnership with Fashion Takes Action and other technical experts also estimated a Canada-wide volume of discarded textiles of 481,000 tonnes in 2018 [3], the year that the study began. This figure was calculated based on the Waste Management Industry Survey issued by Statistics Canada. In the 2018 survey, Statistics Canada reported that Ontario produces a total of 3,980,000 tonnes of non-hazardous residential waste; nationally, this number rises to 10,800,000 tonnes per year [6]. Hence, Ontario represents more than a third of the amount of residential waste in Canada, of which an average of 4.4% was found to be textile waste; this implies a total of 176,000 tonnes of textile waste in Ontario and 481,000 tonnes across Canada was generated from households in 2018. The study also includes a detailed breakdown of the type of textile products found in residential waste into 6 main textile waste categories (clothing, home textiles, accessories, footwear, soft toys, other) and 44 sub-categories.

Since the study focused on household waste sampling, it is assumed that the above estimates do not consider any post-consumer textiles arising from industrial, commercial, or institutional sources.

3.3. Estimates derived from national data on solid waste disposal and diversion

As mentioned above, Statistics Canada tracks data for solid waste disposal in Canada going back to 2002 through the Waste Management Industry Surveys. The data is also categorized by geography and by residential/non-residential sources. From 2002 to 2018 (the latest release), the average growth rate for residential waste generation is nearly 2% year-over-year. If this trend persists, total waste disposed in Canada may increase to over 14.9 million tonnes in 2022, including 783,000 tonnes would be post-consumer textiles, based on findings from Weber et al [8] and the Statistics Canada figures on total textile waste diverted[4].

3.4. Estimates from desk-based research on the flow of used/waste apparel

More recently in 2022, ECCC commissioned Cheminfo Services Inc to produce the report *Characterizing Reuse, Recycling and Disposal of Textiles in Canada* [9] with a dedicated section on used/waste apparel. The report

defines apparel as including clothing and clothing accessories (e.g., scarves, hats, gloves), footwear and accompanying items such as handbags.

This report estimates that 1.34 million tonnes of used/waste apparel were generated in 2021, which nearly triples the other numbers reviewed in this study. It is worth noting that this figure is close to Cheminfo's estimate of the total annual demand of textiles in Canada – 1.3 million tonnes. While the used/waste apparel quantification took a bottom-up approach (summing up more granular data based on textiles disposed and reused/recycled), the total annual demand figure was estimated using a top-down approach (taking the average of six different sources excluding one lower estimate and one higher estimate as outliers).

These two figures, when presented side-by-side, may lead readers to interpret that the quantity of textiles discarded per year would closely track the quantity of new textiles consumed per year. Such a pattern is indeed observed in the flow analysis of clothing conducted by the Australian Fashion Council, where the total quantity of clothing disposed, reused or recycled was around 4% higher than the purchase of new clothing [(10)]. However, it is important to distinguish between correlation and causation. Readers should not conclude that there is a near 1-to-1 relationship between textile purchasing and disposal, given the significant variation and uncertainty involved in deriving these figures and a lack of insights into household behavior on this subject.

3.5. Comparison and adjustment of estimates from different years

Finally, each figure above can be adjusted from their respective baseline years to 2022 using the 2% average annual growth rate for non-hazardous residential waste. This yields a range and an average for the amount of textile waste produced in Canada in 2022 (Table 1). It is also important to point out that all of these estimates are focused in the textiles that go into the waste stream or use waste collection/diversion infrastructure. Therefore, they do not give information on post-consumer textiles that are diverted via p2p channels.

Table 1: Summary of estimated quantity of post-consumer textiles generated in Canada

Source and reference year of source data	Original value (tonnes) and reference year	Level of confidence	Value adjusted for 2022 (tonnes)
a) Derived from ECCC report on plastics waste [(7)] (2016)	333,338	Medium	379,742
b) Weber et al., Fashion Takes Action for ECCC [(8)] using Statistics Canada surveys (2018)	480,576	High	528,363
c) Derived from Statistics Canada surveys and Weber et al's findings on textiles in residential waste [(8)]	N/A	High	782,786
d) Cheminfo Services for ECCC [(9)]	1,335,574	Medium	1,388,696
Average estimated post-consumer textile waste generation, 2022 (tonnes):	**Central estimate:** 770,000 (medium confidence, averaged across all sources)		

4. Textile Waste Collected for Diversion

Information on textile waste collected for diversion from landfill/incineration is scarce, mainly because the collection supply chain rapidly fragments moving downstream, with many different actors and channels. In Canada, textile collection for reuse is mainly conducted through charities by in store donations, collection bins, and door to door collection. For-profit companies that deal with used clothes commonly operate similar channels and schemes; in addition, some of the bigger for-profit players partner with charities to receive clothes directly from donors and pay the charities by the kilo, in a scheme that is known as 'on-site donations' (OSDs).

The only estimate available in the literature for the amount of textile collected for diversion comes from the Cheminfo Services report [(9)] a value of 250,000 tonnes (or 18.7% of total amount generated), of which 241,000

(96% of collected) are estimated to be reused/recycled with the rest sent to landfill/incineration. There is little elaboration on the calculations as data are reported in aggregate form, but the figure is separated into different types of organizations, with over 95% (excluding consignment/resale stores) of the collected quantity going to charities that operate thrift stores or that sell clothes to for-profit thrift stores.

Alternative estimates of the collected quantity can be obtained by multiplying the total generation figures derived above by the 18.7% factor (Table 2).

It is important to point out that at this moment in the value chain, textiles have to be categorized by their grade to determine their possible uses and destinations (reuse, recycling[1], end of life).

Table 2: Summary of estimated quantity of post-consumer textiles collected for diversion from landfill/incineration

Source	Original value (tonnes)	Level of confidence[2]	Value adjusted for 2022 (tonnes)
Total generated derived from ECCC report on plastics waste [7] x 18.7%	62,334	Low	71,012
Total generated from waste composition analysis [8] x 18.7%	89,868	Low	98,804
Total generated from Statistics Canada waste surveys [4] x 18.7%	N/A	Low	146,381
Cheminfo Services for ECCC [9]	250,317	Medium	260,273
Average estimated post-consumer textile waste collected for diversion, 2022 (tonnes):	**Higher-end estimate:** 260,000 (medium confidence) **Lower-end estimate:** 105,000 (low confidence, averaged across the first three sources)		

5. Textiles Received by Retail Store Operations

For textiles destined to be sold for reuse, the next step is to send the textiles to retail store operations. At this point, the definition of the various types of operations are important, as the market presents some particularities:

- Retail stores are considered as business-to-consumer (b2c) channels. Additionally, most of these b2c channels are physical. Consignment and p2p operations are not considered here as they do not receive their supply from the textile waste diversion infrastructure.
- The wording of Retail Store Operations instead of simply Retail Stores is due to the following: Some of the actors in this space, particularly the larger ones, have presence along different parts of the value chain (e.g., they receive donations, sort them and send them to their own retail stores); others perform only one role within it. Additionally, some sorting/grading operations can take place upstream from the stores, commonly in a centralized warehouse. In the last case, retail stores operations receive textiles that have been selected as suitable for selling in the storefronts, i.e. passed forward along the value chain.

For determining the potential value of collected post-consumer textiles, there is a particularly important piece in Weber et al.'s [8] methodology regarding the grading of the sampled waste textile. For their study, collected textiles were assigned to one of 6 grades according to both quality and their possible end use. The distribution of the grades (by weight) was as follows:

[1] Note that true recycling, chemical or fiber recovery or remelting, is limited in Canada.
[2] Entries with a lower level of confidence is due to additional generalization from applying the ratio of flows derived by Cheminfo to various estimates of total generation. This carries on to the downstream estimates.

Table 3: Categorization of the grades of sampled waste textile

Grade	Usability	Weight fraction
A - Perfect	Reuse	13%
B - Excellent	Reuse	4%
C - Good	Reuse	8%
D - Reusable with refurbishment	Reuse/Recycle	40%
E - Recyclable	Recycle	21%
F - Contaminated	EoL	14%

Source: Reproduced from Weber et al. [8]

From here, there are a few important insights:

- 25% of collected textiles can go straight to storefronts for resale, as they are desirable for resale.
- 40%, the highest proportion of any grade, are considered reusable with some sort of refurbishment. This means they may need cleaning or minor repairs and the graders can consider these garments still reusable. These items may be sent to store operations for determining the suitability for resale. If the transaction happening here is selling by weight to a store operator, there is also a financial incentive to pass these textiles forward.
- It is then assumed that up to 65% of the textiles collected for diversion are forwarded to store operations to determine their suitability to go on display/sale.

Table 4: Summary of estimated quantity of post-consumer textiles received by retail store operations

Source	Original value (tonnes)	Level of confidence	Value adjusted for 2022 (tonnes)
Total collected derived from ECCC report on plastics waste [7] x 65%	40,517	Low	46,158
Total collected derived from waste composition analysis [8] x 65%	58,414	Low	64,223
Total collected derived from Statistics Canada waste surveys [4] x 65%	N/A	Low	95,148
Total collected derived from Cheminfo Services [9] x 65%	162,706	Medium	169,178
Average estimated post-consumer textile received by retail store operations, 2022 (tonnes):	**Higher-end estimate:** 169,000 (medium confidence) **Lower-end estimate:** 68,500 (low confidence, averaged across the first three sources)		

6. Textiles Received by Sorters/Graders/Processors/Brokers/Exporters

A very important piece of the post-consumer textile market is composed by a variety of actors that find end markets for the items that do not sell in retail stores. The flows here may be complex, as some of these organizations operate in different parts of the value chain; but their inflows can be simplified as:

- **Imported textiles:** Used textiles, as evidenced by the volumes discussed in this report, have become an important resource that fuels different actors in a growing market. Therefore, imports play a part in stabilizing supply when local sources are lower and providing top tier garments with a higher price mark. This is analyzed in more detail in Section 9.
- **Textiles received directly from diversion activities:** Referring back to the grade composition table (

  Table 3), it is assumed that the textiles that fall under category E 'Recyclable' are diverted to this step

in the chain; the main reason for this is that, today, Canada does not have the infrastructure to recycle textiles at scale, with the only textile recycling operation is at pilot stage [11]. Textile brokers/exporters/processors can either find markets for these clothes that are considered not wearable by Canadian consumers (which is a practice with several ethical and environmental implications), or sell them in bulk for downcycling into rags and wipes.

- **Textiles sent from retail store operations:** As seen in Section 5, retail stores receive a very diverse stock of textiles in terms of quality grades; these range from practically new to textiles in grade D that may require some cleaning and repair (e.g. sewing on buttons, fixing zippers, mending holes, replacing elastics, etc.) or which show evident wear and tear. The reality is that these cleaning or repair activities are not commonly performed by any operator as part of standard business practice as there is little financial incentive to do so; and that the volume of grades A to C (plus some imports) is likely enough to cover the current demand of the Canadian market for used textiles. Therefore, store operations elect to reject these grade D textiles and send them to brokers/processors/ exporters to find other end markets.

  Additionally, from the pieces that do make it to the stores, there will always be a fraction that is not bought by consumers. Such garments are eventually sold in bulk to brokers/exporters. In total, different data sources suggest that around 75% of textiles from store operations are eventually forwarded to brokers/processors/exporters.

Table 5: Summary of estimated quantity of post-consumer textiles not sold for reuse but sent to downstream operators

Source	Original value (tonnes)	Level of confidence	Value adjusted for 2022 (tonnes)
Total collected derived from ECCC report on plastics waste [7] x 21% (Grade E)	13,090	Low	14,912
Total collected derived from waste composition analysis [8] x 21% (Grade E)	18,872	Low	20,749
Total collected derived from Statistics Canada waste surveys [4] x 21%	N/A	Low	30,740
Total collected derived from Cheminfo Services [9] x 21% (Grade E)	52,567	Medium	54,657
Subtotal average estimated post-consumer textiles received by downstream operators directly from diversion activities, 2022 (tonnes)	**Higher-end estimate:** 54,657 (medium confidence) ***Lower-end estimate:*** *22,134* (low confidence, averaged across the first three sources)		
Total sent to RSO derived from ECCC report on plastics waste [7] x 75%	30,388	Low	34,618
Total sent to RSO derived from waste composition analysis [8] x 75%	43,811	Low	48,167
Total sent to RSO derived from Statistics Canada waste surveys [4] x 75%	N/A	Low	71,361
Total sent to RSO derived from derived from Cheminfo Services [9]) x 75%	122,030	Medium	126,883
Subtotal average estimated post-consumer textiles rejected by RSOs, 2022 (tonnes)	**Higher-end estimate:** 126,883 (medium confidence) ***Lower-end estimate:*** *51,382* (low confidence, averaged across the first three sources)		
Total received by downstream operators	Higher-end estimate: 182,000 (medium confidence) Lower-end estimate: 73,500 (low confidence)		

7. Textiles Exported

From publicly available Canadian trade information, the commodity codes HS 6309 (Worn Clothing and Other Worn Textile Articles) and HS 6310 (Used or New Rags of Textile Materials) can be tracked to determine the value of exports for the year 2022 [11] From that point, there are supplementary references that can help translating CAD values into net weight.

- HS 6309 – Worn Clothing and Other Worn Textile Articles: The data shows that in 2022, Canada exported textiles in this category for a total value of CAD 193,125,529. Additionally, in the 2021 Fashion Takes Action report [11], it is stated that the price per pound of baled secondhand clothes is between CAD 0.3 and 1.5 per pound (0.66 – 3.3 per kg). Applying these numbers we get a low estimate of 58,400 tonnes, and a high estimate of 292,001 tonnes exported in this category.
- HS 6310 – Used or New Rags of Textile Materials: In 2022 there were exports for CAD 25,864,902 in this category. The price per kilogram was estimated through consulting various vendors with price sheets on their websites. Although there are different qualities and packaging options for the rags, a price of around CAD 2.29 CAD per kilogram was estimated [12]. This price is a sensible assumption as it reflects the lower end price for used textiles plus the labour and equipment cost of the basic processing for ragging and packaging.

Estimation (high level of confidence; numbers rounded for significance):

Used clothes:
- Higher-end estimate: 292,000 tonnes
- Lower-end estimate: 58,400 tonnes
- Average: 175,200 tonnes

Rags: Average of 11,300 tonnes
Total exports:
- Higher-end estimate: 303,000tonnes
- Lower-end estimate: 70,000 tonnes
- Average: 186,000 tonnes

8. Textiles Sent for End of Life (landfill/incineration)

In Canada, 97% of solid waste requiring final disposal is sent to landfills, and 3% is incinerated [2]. This leads to the conclusion that practically all textiles collected that are deemed as grade F are sent to landfill (14% of collected for diversion). This category comprises items that are considered contaminated and may affect other pieces if stored together. Post-consumer textile waste disposed and not collected for diversion is also assumed to be landfilled.

Table 6: Summary of estimated quantity of post-consumer textiles sent for End of Life management

Source	Original value (tonnes)	Level of confidence	Value adjusted for 2022 (tonnes)
Total collected derived from ECCC report on plastics waste [7] x 14% (Grade F)	8,727	Low	9,942
Total collected derived from waste composition analysis [8] x 14% (Grade F)	12,581	Low	13,833
Total collected derived from Statistics Canada waste surveys [4] x 14%	N/A	Low	20,493
Total collected derived from Cheminfo Services [9] x 14% (Grade F)	35,044	Medium	36,438

Subtotal average estimated post-consumer textiles sent to landfill after collection, 2022 (tonnes)	**Higher-end estimate:** 36,438 (medium confidence) **Lower-end estimate:** *14,756* (low confidence, averaged across the first three sources)		
Not collected derived from ECCC report on plastics waste [7]	N/A	Medium	698,885
Not collected derived from waste composition analysis [8]		High	671,093
Not collected derived from Statistics Canada waste surveys [4]		High	623,516
Not collected derived from Cheminfo Service [9]		Medium	509,624
Subtotal average estimated post-consumer textile waste collected for diversion, 2022 (tonnes):	**Central estimate:** 625,779 (medium confidence, average across all sources)		
Total average estimated post-consumer textile to landfill, 2022 (tonnes):	**Higher-end estimate:** 662,218 (medium confidence) **Lower-end estimate:** 640,535 (low confidence)		

9. Textiles Imported

The estimation of imported used textiles follows a similar rationale to that of exports, taking the trade information and finding an estimate for the price per kilogram to derive the mass flow [13]. However, the price at which textiles are imported is not as straightforward to determine as it varies significantly depending on the type of commodity (6309 – 6310) and the country of origin. For example, used clothes of recognized or luxury brands from western countries will most likely be imported to be sold in vintage shops; bulk used rags from Asia are probably being further processed in Canada or being brokered.

Fortunately, the United Kingdom, a comparable economy to Canada, publishes trade data including not only price but weight too. With the important assumption that used textiles import in Canada and the UK have similar patterns of foreign imports, the UK price per tonne ratio can be used to estimate the weight of textiles imported to Canada.

There are interesting insights from this exercise, the main one being that the United States represents 75% of the total imports in value, while being around 22% of total weight, but almost 85% of the category Worn Clothes (6309). Meanwhile, Pakistan represents less than 10% of value but almost half of total weight of imports, from which almost 100% are rags (6310).

These results lend credence to the use of the UK value per unit weight data.

Estimate (Medium level of confidence): 16,400 tonnes

10. Textiles Sold in Retail Stores

10.1. Textile volumes

ECCC's report *Economic study of the Canadian plastic industry, markets and waste* [7], determines that 25% of textiles placed for sale in stores are not sold and are so directed to end-of-life treatment. The total amount of textile placed in retail can therefore be back-calculated from the waste figure. This is a good estimate but needs a small addition of the portion of the imports corresponding to the 6309 commodity code (Worn Clothing and other Worn Textiles), which is close to 4,000 tonnes.

Table 7 summarizes a number of routes to calculating tonnages of textiles sold in retail stores.

Table 7: Summary of estimated quantity of post-consumer textiles sold in retail stores for reuse in Canada

Source	Original value (tonnes)	Level of confidence	Value adjusted for 2022 (tonnes)
Total received by RSOs derived from ECCC report on plastics waste [7] x 25%	10,100	Medium	11,500
Total received by RSOs derived from waste composition analysis [8] x 25%	14,600	High	16,100
Total received by RSOs derived from Statistics Canada waste surveys [4]	N/A		23,800
Total received by RSOs derived from Cheminfo Services [9] x 25%	40,700	Medium	42,300
Average estimated post-consumer textile sold on for reuse in Canada by RSOs, 2022 (tonnes):	**Higher-end estimate:** 42,300 (medium confidence) to 46,300 (including the impact of imports) **Lower-end estimate:** 17,100 (low confidence) to 21,100 (including the impact of imports)		

10.2. Textile values

The Salvation Army Thrift Store's (TSATS) annual report provides a relevant data point for estimating market value. This 2022 assessment estimates total sales at CAD 152 million. Market expert interviews suggest that about 65% of TSATS revenue comes from textile sales and that approximately CAD 8 million is from sales to sorters/graders. The balance of TSATS revenue (textiles to consumer) is therefore CAD 91 million.

Industry reports indicate that TSATS has a market share of 7.5%, although interviews indicated this might be nearer 12% [14], Taking these two the estimation range for the value of the market is between CAD 0.757 billion to CAD 1.260 billion.

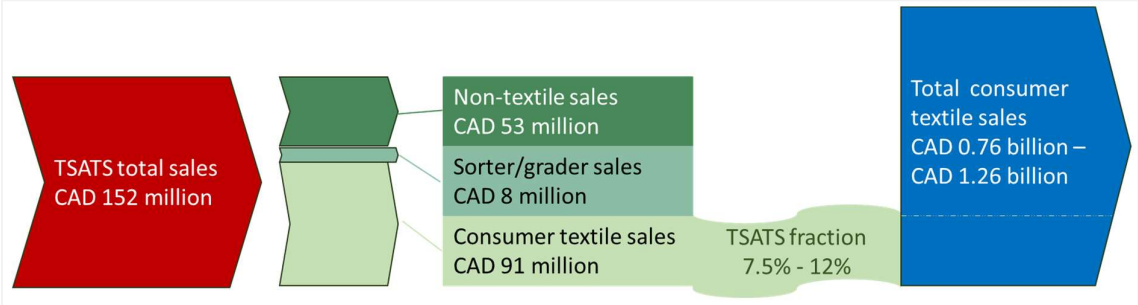

Figure 6: Total retail sales of used textiles estimated from TSATS sales

The same report cites a broad value for the Canadian used good stores market of CAD 3.0 billion, of which textile sales comprise 35.9%. This implies a used textiles market of value CAD 1.08 billion, broadly midway between the two estimates above.

Table 8: Summary of estimated value of post-consumer textiles sold in retail stores for reuse in Canada

Source	Value for 2022 CAD
Size of Canadian second-hand textiles market derived from TSATS revenue + industry report market share	CAD 1.260 million
Size of Canadian second-hand textiles market derived from TSATS revenue + estimated market share from interviews	CAD 757 million
Size of Canadian second-hand textiles market derived from industry report	CAD 1.077 billion
Average estimated market size of post-consumer textile sold on for reuse in Canada	CAD 1.032 billion

11. Peer-to-Peer Channels (consignment – online)

As there is limited information regarding the volumes of post-consumer textiles that are sold across all channels in Canada (including p2p), deriving any information about the total volumes needs to be done outside-in. For doing so, there are different sources that place the global second-hand apparel market at an upper value of USD 119 billion [(15)] and a lower one of USD 71 billion [(16)]. The same sources have some proportions of North America as a part of the total and Canada as part of N/A; the final range for the Canadian second-hand apparel market is then estimated between CAD 3.7 and 6.2 billion. Then from other reports, annual report and market share estimates, it can be estimated that the Canadian used textiles market represented in retail stores is worth CAD 1,03 billion.

Therefore, the income from the P2P channels (consignment and online) ranges from CAD 2.68 to CAD 5.17 billion.

If a similar price per kilogram as that estimated for retail stores was used for this range, it would represent between 111,000 to 215,000 tonnes (low level of confidence).

However, this will likely be an overestimation as the average price per item of garments sold online and in consignment stores could be significantly higher than that of thrift retail stores. Therefore, the amount in kilograms would be proportionately lower.

12. Conclusions and Recommendations

12.1. Material and value flows

Figure 7 summarizes the key findings on the material economic flows of post-consumer textile in Canada. Two scenarios, higher-end (Appendix A) and central estimates (below), are presented due to large variance in the data. For each stage of the flow, existing data points have been consolidated and compared alongside the estimates derived in this study.

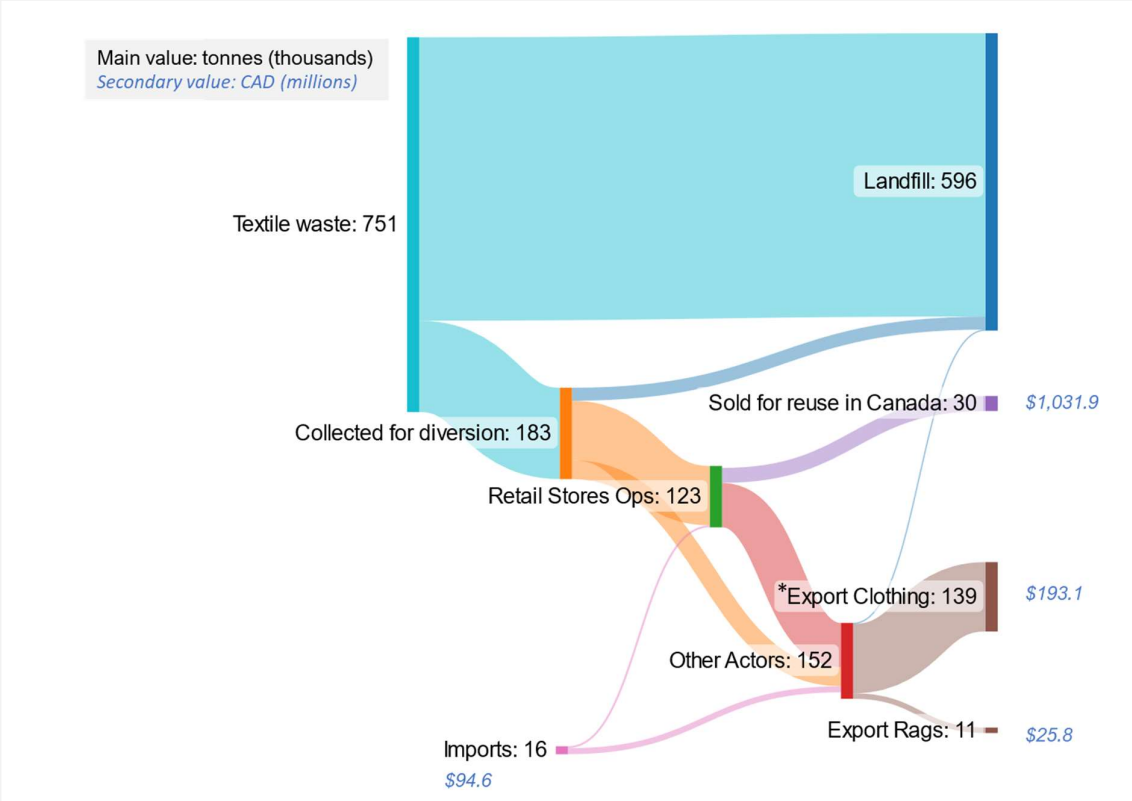

Figure 7: Summary of economic flows and the central estimates of the flow of post-consumer textiles in Canada

Notes: In the central estimate scenario, the figure of 139 thousand tonnes of clothing exported is a balance of the other flows. The actual average derived from trade data and average export prices is 175 thousand tonnes (see Appendix: Higher-end Estimate Scenario).

Over 75% of all textiles which are discarded end up in landfill or incineration, with a commensurate loss of value; simply scaling the productively diverted fraction across the whole of discarded textiles would imply a potential further value of over CAD 3 billion to be realized. In addition, taking a conservative view of potentially avoided greenhouse gas emissions associated with a second life for textiles, around 15 million tonnes of carbon dioxide could be averted[3].

12.2. Recommendations

Overall, this report highlights the complexity of the post-consumer textile market in Canada, which involves multiple players and stakeholders across the value chain. The findings underscore the opportunities for increasing textile collection and diversion from landfill/incineration, and incentivizing reuse and repair. The recommendations are focused on harmonizing definitions, adopting common methodologies and frameworks for waste characterization, and improving data collection across the value chain to allow for better coordination between actors, informed decision-making, transparent progress monitoring and communication. These recommendations are laid out below, assigned to primary actors who can make them happen.

The major actors are municipalities and regional governments, as well as operators that facilitate charitable reuse such as NACTR members and other well-established local organizations. Improvements to textile waste diversion from landfill is dependent on a collaborative approach between these parties.

Key recommendation for major actors:

[3] Assumes around 30 $kgCO_2e$ through-life emissions avoided for new life textiles.

The following recommendations require the cooperation and collaboration of national and provincial data collection agencies.

- **Track textile waste disposal and diversion separately.** Statistics Canada's decision to include textile waste diversion in the Waste Management Industry Surveys since 2018 is commendable. A similar approach to establish a national baseline for textile disposal and diversion figures would enhance the accuracy of evaluating the impact of textile waste diversion efforts and the growth of the secondary textile industry.
- **Establish a common framework of definitions, product classification, and waste sampling/auditing methodology.** The literature review revealed a lack of harmonized framework for classifying and characterizing post-consumer textiles. Municipal, regional and provincial governments could adopt NACTR's textile waste audit guidelines and definitions when conducting waste composition assessments in companies. This would assist in better identifying product hotspots to be targeted for diversion efforts. It would enable more accurate analysis of textile reuse by NACTR members as a proportion of total textile diversion handled by government and business actors.
- **Establish a common methodology for quantifying the carbon emissions of textile waste management** . Stakeholders should collaborate to ensure that future work on product life cycle assessment incorporates considerations of the emission impact from textile reuse, recycling and End-of-Life management (landfill, incineration and export)[4]. Communicating to consumers fairly and consistently that reuse has a key role in averting these impacts is core.

The following recommendation requires the financial support of municipalities so that NACTR members can take action:

- **Establish a regular source of funding and program of work for waste composition and impact analysis.** NACTR membership has the opportunity to step up and establish itself as the gatekeeper to data on textile diversion. It is strongly recommended that NACTR collects quantitative textiles flow data, especially the quantities collected.

The following actions can be taken by NACTR members:

- **Standardize and improve data collection from NACTR members.** In applying for NACTR membership, applicants make some disclosures about their channels for collection and types of operation. However, practice in actively collating ongoing performance data varies widely across the membership. Across NACTR, consolidated, dynamic data would greatly assist in understanding trends and performance, and provide an evidence base for future initiatives. Disclosure of data about the volumes not sold for reuse in Canada will be uncomfortable for many operators in the supply chain: Sorters, graders and exporters can be extremely hesitant to share data; however, in many industries aspiring to circularity, value chain transparency is on the rise.
- **Align definitions with for-profit actors.** Due to commercial sensitivity, data from for-profit actors are often difficult to source. It is recommended that NACTR members engage with public for-profit companies (e.g., Value Village) to align terminologies and definitions related to post-consumer textiles, facilitating data comparison and analysis.
- **Engage with p2p platforms and large consignment stores.** Consumer awareness and uptake of p2p platforms and consignment stores is on the rise as they look to reclaim value from their unwanted items. Industry stakeholder working groups would benefit from liaising with these channels to better understand the volumes transacted, and their impact on the rest of the secondary market.

[4] A recent report of a long-running study series by Zero Waste Scotland made BBC headlines with the finding that "…textiles were just 4% of what was binned in 2021, in terms of weight, but accounted for 32% of the carbon footprint generated by household waste" (42)

13. Annex to Appendix A: Higher-end Estimate Scenario

The following figures and flows are based on the higher-end estimates derived in the report. Notably, the estimated rate of collection for diversion is 34% in comparison to the central estimate of 24%.

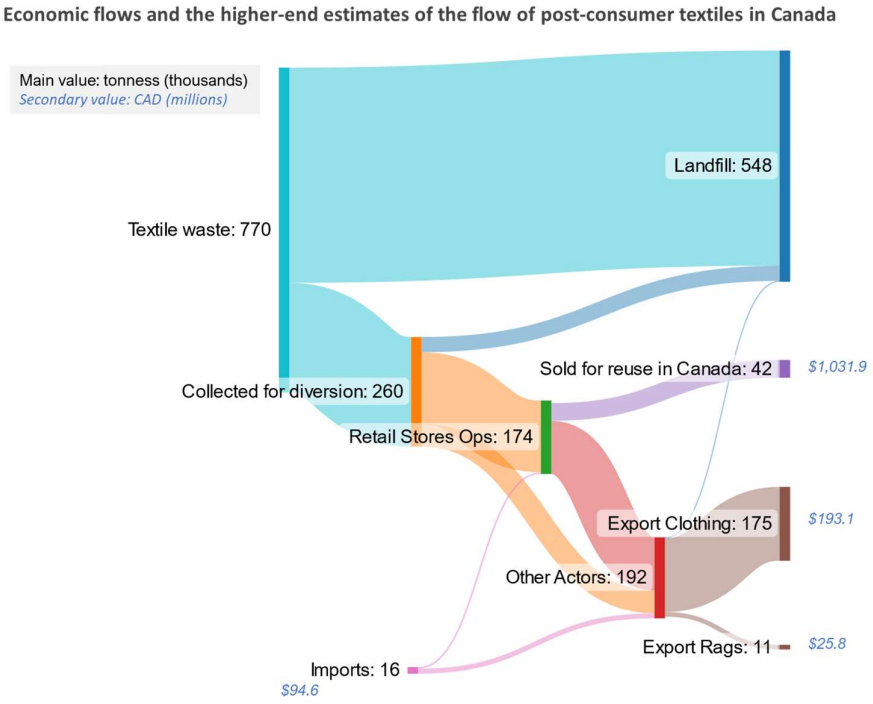

Figure 8: Summary of economic flows and the higher-end estimates of the flow of post-consumer textiles in Canada

Appendix B

Recommendations for Developing an Infrastructure Road Map to Increase Textile Reuse for Landfill Diversion

Contents

Figures

Tables

1. The Case for Change

This appendix considers the existing infrastructure, gaps in capacity or capability, and how they might be filled, and by whom.

Textile usage is a fundamental part of everyday life. However, business models such as fast fashion have doubled the consumption of textiles in the last 15 years, causing detrimental environmental impacts which ultimately damage our health, wellbeing, and livelihood. These impacts have been extensively documented, resulting from an estimated 92 million tonnes of textile waste being generated every year globally [17].

The Canadian baseline has been established through a material and economic flow analysis commissioned by the National Association for Charitable Textile Recycling (NACTR) and funded by Environment and Climate Change Canada (ECCC) (see Appendix A). It reveals that, in Canada, consumers discard 750,000 to 770,00 tonnes of used textiles annually. Despite the on-going efforts of municipalities, charities and for-profit collectors, the level of collection for diversion from landfill or incineration has stagnated at 24%. Towards the top of the waste hierarchy, Figure 9, around 16% of the collected textiles are sold and reused in Canada, with some thrift stores having to import used textiles from other provinces and countries to meet (sometimes fluctuating) demand.

Figure 9: The waste hierarchy

Around 76% of the textiles collected in Canada are exported for reuse, downcycling, or end up being landfilled. The proportion of reusable versus non-reusable export from Canada remains a knowledge gap. Globally, it is estimated that 40% of the textiles exported are discarded in landfills on arrival [18]. At the bottom of the waste hierarchy, nearly 80% of the total textile waste generated are landfilled or incinerated, exceeding the Ellen MacArthur Foundation's estimate that 73% of clothing are landfilled/incinerated globally [19]. Canada's reliance on landfilling/incinerating and exporting post-consumer waste textiles continues to drive up greenhouse gas (GHG) emissions at the disposal stage; and perpetuates an unsustainable and linear pattern of extraction – production – consumption – disposal.

As emphasized by the IPCC in its Sixth Assessment Report, rapid, deep and, in most cases, immediate greenhouse gas emissions reductions in all sectors are required to seize the "rapidly closing window of opportunity to secure a liveable and sustainable future for all" [20]. The textile sector has the responsibility and opportunity to reshape the post-consumer textile value chain into one aligned with the 1.5°C warming scenario and Canada's own emission reduction target of 40% to 45% by 2030 [21].

Building on the learnings from the material flow analysis, this report proposes four overarching ambitions for actors involved in the textile secondary market to accelerate the transition (Figure 10):

1. Reducing waste going to landfill and incineration: minimize the leakage of textiles, especially reusable textiles, into the environment at every stage of the value chain – collection, sorting/grading, and export.
2. Promoting charitable reuse: encourage charitable donations and spotlight circular behaviour/initiatives/business models such as textile life extension and reuse.
3. Improve the quality and transparency of post-consumer textile trade: Post-consumer textiles are a globally traded commodity. However, increased collaboration and accountability across the value chain is necessary to raise the bar on:
    - the quality (level of sorting applied and proportion of reusable textiles), and
    - the transparency (on the downstream impact and material end fates) of textile exports from Canada.

4. Reducing overconsumption: ultimately, the secondary market should work to counter overconsumption by keeping products in use for longer and displacing the need for new products.

The following sections of the report take stock of the existing infrastructure and initiatives, draw learnings from best-practice case studies from Canada and further afield, and establish an outline roadmap for progressing towards these 4 ambitions.

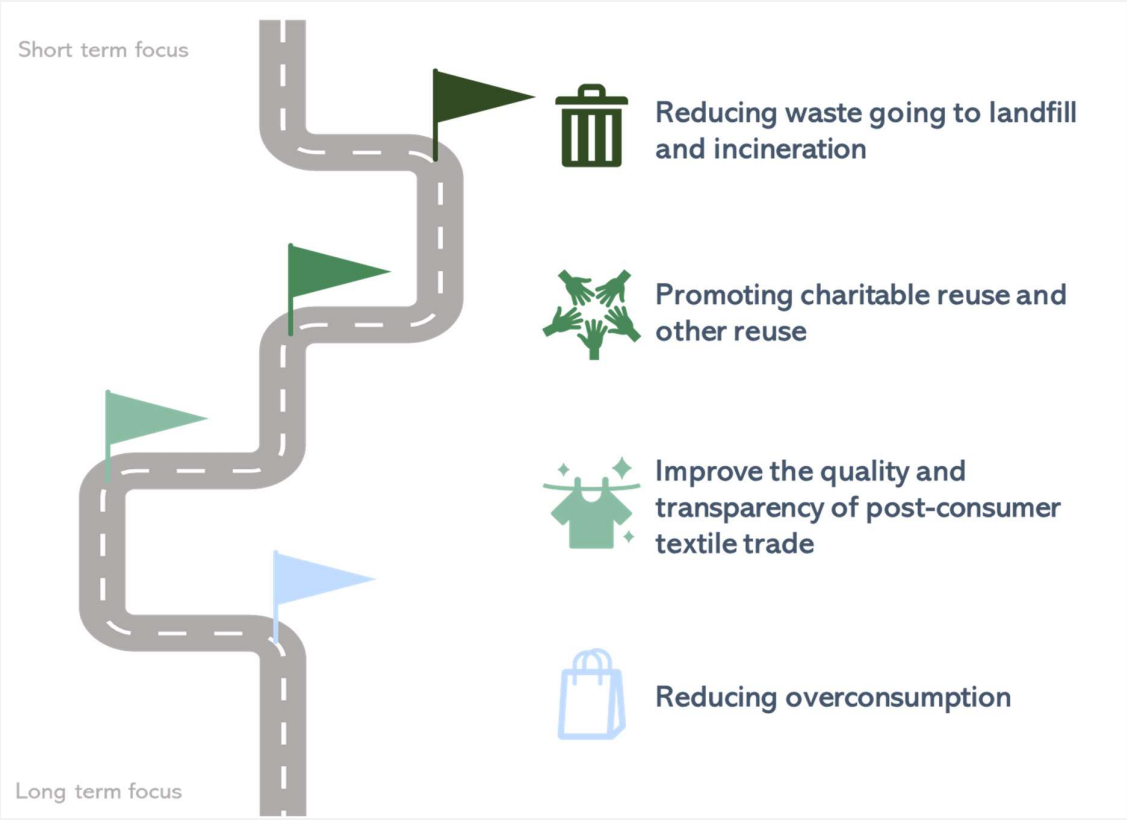

Figure 10: Overarching ambitions for the Canadian secondary textile market

Within this roadmap, a number of key action points have been identified. Those relevant to the infrastructure are identified in this report. Those relevant to understanding flows of used textiles are described in the accompanying *Material Flows* appendix (Appendix A). A synthesis of the two is pulled together in the *Key Findings* section.

2. Developing Capacity for Change

As a follow-up to the material flow analysis of Appendix A, the current infrastructure, stakeholders and their interactions were mapped as in Figure 11 to identify opportunities for driving change.

The first critical point for intervention is at the disposal phase, where an estimated 76% of post-consumer textiles never enters the collection system and are directly landfilled or incinerated. A variety of collection channels were identified, although data is very limited concerning their relative scale especially at the provincial/municipal level [(22)]. There is therefore a need to examine how people are currently disposing of used clothing and other textile products, understand what influences this behavior, and investigate what communications and other interventions may direct more textiles towards collection for reuse and recycling.

The accessibility of collection infrastructure is a key enabling condition for greater textile diversion, as evident from France's experience with the Extended Producer Responsibility (EPR) scheme for textiles. Under the EPR

scheme, producers are required to invest in the collection and end of life treatment of products. Since implementation, this had led to a collection rate of 39% in 2020, notably higher than the global average [23].

The second critical point for intervention is at the point of processing for reuse or repair, which can be undertaken by charities, for-profit actors or downstream operators such as sorters and graders. As highlighted in the material flow analysis, there is currently very limited data on the actual end fates of textiles processed by these operators, and their operations are typically opaque to the textile collectors. Increasing collaboration with sorters and graders will be key for enhancing the transparency and credibility of the Canadian secondary market. Their engagement will also be essential for understanding how the sorting/grading process might adapt to, or facilitate, cross value chain interventions such as landfill bans, expansion of collection infrastructure, circular product design and business model innovations.

In summary, the infrastructure mapping exercise highlighted three focus areas for capacity building:

- Expansion of physical infrastructure to make textile collection and reuse convenient and at scale.
- Engagement, collaboration and standardization to enhance transparency and drive circularity.
- Public communication and education to promote circular behavior including charitable reuse.

The rest of this section elaborates on each of these aspects and provides insights into delivering change towards the four overarching ambitions outlined in Figure 10

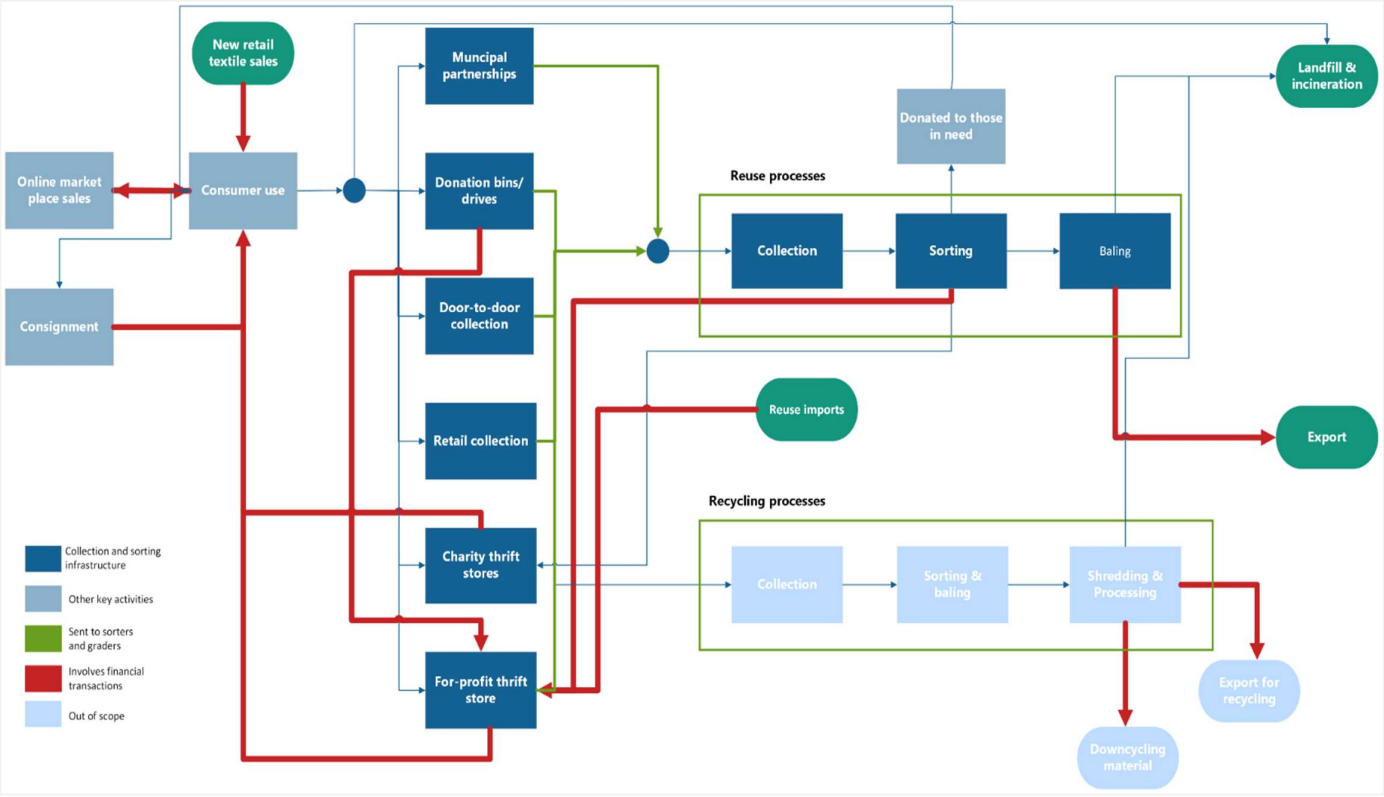

Figure 11: Key activities in the Canadian secondary textile market

3. Establish a Common Front and Common Standards

3.1. The current Canadian landscape

The Canadian textile sector comprises several networks of different collaborators already working to bring changes along the value chain. These collaborations typically support the infrastructure and logistics needed for diversion. Currently there are several national level partnerships across Canada, such as NACTR, charity partnerships with Value Village Canada and the Fashion Takes Action campaign that take place on a national level. At the local level, there exist many other partnerships being led by municipalities.

Cross value chain collaboration: Fashion Takes Action (FTA)

Established in 2007, this organization aims to advance sustainability in the entire textiles ecosystem through education, awareness, research and collaboration. The organization aims at collaborating with all stakeholders across the textile ecosystem including brands, retailers, non-profit organizations, governments, academics and concerned citizens. To develop more opportunities for collaboration they will soon be launching the Canadian Circular Textiles Consortium (CCTC) with the aim of driving more circular outcomes in the industry.

In 2020, The FTA conducted an extensive feasibility study which highlighted the need and interest to grow the textile recycling industry in Canada; and provide to advanced, scalable solutions for addressing the end-of-life management of products when they (eventually) become non-reusable. The feasibility study also highlighted the potential of implementing a textile EPR to invest in the necessary processes and technologies to reduce Canada's environmental impact.

For-profit collection: Value Village Canada and charity partnerships

Value Village has over 130 thrift stores in Canada and have a partnership model with some charities and non-profit organizations. Value Village stores accept donations from or on behalf of these charities and in turn pay these partners for the materials and/or the usage of their name and goodwill. This helps to fund various programs for different charitable organizations without the need for managing their own collection/sorting infrastructure. Current partnerships include:

Figure 12: Value Village Canada partnership members

Charitable collection: The National Association of Charitable Textile Recycling (NACTR)

NACTR is a leadership initiative consisting of 14 Canadian charities and non-profit organization with presence nationwide. With a core belief of collaboration in a shared value, their main goal is to combine their strengths to increase the awareness of textile donations for reuse and upcycling, and increase funding for individual social causes.

To increase diversion rates, the organization has partnered with several municipalities such as the Region of Peel, the City of Markham, Niagara Region and Metro Vancouver to name a few. Having such a well-established industry organization for charities gives population centres a convenient way to create these alliances without having to work with every charity individually.

Figure 13: NACTR partnerships

Municipal collection with charity partners: The City of Markham

The City of Markham Council launched a textile recycling program in 2016 and attributed their successes to partnerships with NACTR (The Salvation Army (SA), Diabetes Canada and STEPS for Recovery). Since the launch of this program, over 4,000 tonnes of textiles have been diverted from landfills [24] to reuse activities. This partnership puts emphasis on engaging with residents, and co-branding the campaign so residents are aware of where their donations are going to.

Other municipalities can use this partnership model as a guide in creating an harmonious diversion scheme that focus on diversion from landfills and raising funds for charities.

Engaging with the community and local actors: Metro Vancouver Think Thrice Campaign

In 2016, Metro Vancouver projected that textile waste made up 5% of the region's landfill garbage [25]. To reduce this impact, the region developed the behavioral change campaign, Think Thrice which encourages residents to 'reduce, reuse and rethink' about the textiles they own. This initiative covers all regions within the Vancouver metropolitan area.

The reuse part of this campaign provides online information for consumers to encourage better disposal. It provides consumers with information on what textiles (both reusable and non-reusable) can be donated, and where the nearest collection point is for the user, as well as details on how to set up at home collections.[26] Metro Vancouver, in contrast to other platforms, has a single database for all 21 of its municipalities, ensuring that no area is overlooked. This is advantageous since it ensures equal access to information across municipalities whilst still using the same pool of resources to develop a convenient one-stop shop with consistent messaging. This approach of collaboration amongst municipalities at the level of regional districts could be a blueprint for other regions.

Case Study #1

Flanders, Belgium [27]

To develop effectively local reuse and recycling in Flanders, the city began taking a more active role in textile collection via its tendering process. Through this, five previously competing textile collectors partnered to form a collective.

This collective removed all existing infrastructure and on-streets (to reduce contamination from other textiles) and replaced these with collection bins in libraries and shops. Managed and measured door-to-door collection was also introduced. These measures resulted in an increase in the collection rate of high-quality textiles by 12% in the first 9 months.

Toronto's repair network

The City of Toronto has established a comprehensive network centered on reuse, which includes bringing communities together for educational opportunities or providing no-cost services to prolong the life of textiles.

- Repair cafes: Volunteers provide free textile and clothing repairs through events such as Textile Repair Thursdays. Participants who have clothing or other textiles that require mending or changes can bring them in and receive instructions on how to fix them [28].
- Toronto Clothing reparation: A community initiative that hosts clothing repair events and workshops to teach people how to repair their own clothes [29].

In summary, many partnerships in Canada already recognize the need to target the top of the waste hierarchy by extending product lifetime and prioritizing reuse. In the long term, collaboration amongst municipalities and with charitable collectors will be essential in:

- educating the public and promoting circular behaviors such as making considered purchases
- exploring emerging alternative consumption models such as sharing and renting
- learning to repair and repurpose textiles
- embracing reuse and thrift shopping to reduce overconsumption

Engagement with sorter/graders and exporters and standardization of good practices to improve transparency

Very little is known about the sorting & grading industry in Canada due to the controversy surrounding the exporting of textile waste. The network consists of several dozen sorters and graders operating in the Greater Toronto Area or Vancouver. According to Greenpeace, the variety of different quality textiles are often exported, with an estimated 40% of this being made up of low-quality material destined for landfills or incineration on arrival [18]. This is also a key consideration of the EU's recent strategy for sustainable and circular textiles, with stakeholders expressing concerns on the apparently rising level of unsorted textiles to developing countries (to keep labour cost associated with manual sorting low). Stakeholders also urged interventions to ensure that exported, sorted textiles for reuse and recycling are monitored to their end fates. Similar policy discussions will likely grow in priority across Canadian provinces and territories. It is therefore in the common interest of collectors and sorter/graders to collaborate on improving the transparency and social/environmental practices of the downstream operations.

Case study #2

Charity Retail Association

TRUST – Trade Recycling Universal Standard [30]

TRUST is a scheme which provides certification to companies that purchase goods from charity retailers and other entities (e.g., local authorities, textile recyclers/collectors/sorters/graders).

TRUST aims to separate the operators adhering to high standards from those that are less reputable, in an objective and transparent way. The end goal is to give charities the confidence that their goods will be collected in a timely manner, that they will be paid promptly, and that the traders are obeying the law and upholding high standards in their operations.

Behind TRUST is an audit process that looks at the areas of sound business practice, health, and safety, working conditions, environmental sustainability, and compliance with transport regulations.

3.2. Where we could be and how we get there

Collaboration for increasing collection

Charity partnerships with municipalities have shown great potential in diverting textiles from landfill and incineration. Collaboration amongst municipalities could help to scale the partnership model, for example by disseminating the learnings from Markham and other pioneers on the practicalities of engaging with stakeholders and residents to ensure there is buy in from the communities. Additionally, there is an opportunity for NACTR to amplify its impact by sharing knowledge and best practices with local small charities, non-profit organizations and social enterprises that facilitate textile reuse.

Case study #3

M&S/Oxfam Partnership - Shwopping [31]

Marks and Spencer (M&S) began a partnership with Oxfam in 2008 to promote reuse and recycling. Any item of clothing and soft furnishings (in any condition from any retailer) are accepted through a wide network of M&S locations and Oxfam stores. M&S manages all collections from M&S in 3 ways:

- Resold in-store, online, or at festivals.
- Reused in Oxfam's social enterprise scheme (Frip Ethique) in Senegal or in other countries around the world.
- Any clothes that cannot be resold or re-used are sent in bulk to reprocessing companies to be recycled as carpet underlay or mattress filling (which can be used by businesses like M&S).

Partnerships between retailers and charities also have the potential to increase consumer awareness and participation in reuse schemes. For example, in the UK, the charity organization WRAP (Waste & Resources Action Programme) developed a retailer clothing take-back guide which featured charity partnership as one of the key models for product take-back, citing benefits such as increasing customer participation, benefits to charitable causes, and more in-county reuse through partner charity shops. The guide suggested ways where retailers could lean on the charities' expertise, e.g., with regards to collection from multiple stores, processing a wide scope of textiles and footwear, provision of in-store collection units with opportunity for shared branding, promotion, and communication of the scheme.

Partnerships for sorting, grading & exporting

To ensure unsold secondary textiles exported are meeting a high standard, leading organizations and industry platforms – such as NACTR, Savers Canada and the Canadian Circular Textiles Consortium (CCTC) – could develop a common position to leverage for a greater transparency. To future-proof operations against increasing public and political interest in this part of the value chain, actors in the secondary market should take a proactive approach to demonstrate their credibility and sound environmental management practices. A prime place to start is for leading collectors and sorter/graders to work together on establishing a code of practice and auditing standards to drive improvements in processes and disclosure of the material end fates.

Table 8: Summary of recommendations and desired impact – engagement, collaboration and standardization

Overarching ambitions	Desired impact through improved engagement, collaboration and standardization
Reducing waste going to landfill	✓ Dissemination of learnings to enable adoption of best practices across municipalities and charities.
Promoting charitable reuse and other reuse options	✓ Increasing brand visibility of NACTR-affiliated charities at collection points, product life extension guidance and other reuse-related events, could increase public trust/interest in the textile collection and reuse system.
Improve the quality and transparency of post-consumer textile trade:	✓ Partnerships and collaboration could drive more transparency on sorting/grading and exporting processes. Standards and minimum requirements adopted by leading collectors could create competitive advantages for downstream operators to engage and improve their practices.

4. Promote Charitable and Other Forms of Reuse

4.1. The current Canadian landscape

Municipalities have created online platforms to inform the public on the following topics to stimulate participation in the textile circular economy:

- Locations of nearby charity collection points (via municipalities & the NACTR website).
- Information on caring for and repairing textiles.
- Dates and locations for repair and textile swap events.

Through their donation site locator, NACTR offers location information for all their member retail outlets and collection bins on a national scale. Users need only enter their address to find the closest donation site. The user can move between the many donation bins and retail store options that are available to them.

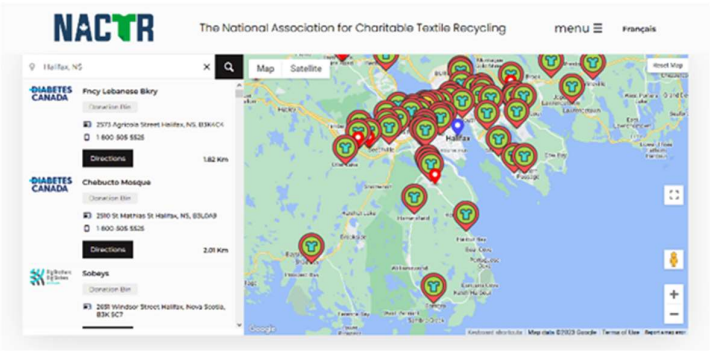

Figure 14: NACTR donation site locator

Many regions have a similar system in place, with Metro Vancouver and the City of Toronto each having a site locator for all donation locations (covering other materials/products). These websites provide straightforward guidance, which lessens public uncertainty. There is opportunity to explore whether these websites could provide residents with more donation options, such as local charities, not-for-profits and social enterprises, as well as for-profit actors such as local consignment stores and other thrift shop chains like Value Village.

Metro Vancouver and the City of Toronto also provide comprehensive instructions on how to maintain and fix textiles. Toronto frequently hosts community-building events involving residents, such as repair events. This encourages more people in the public to engage in the importance of repair and textile care by creating a sense of community.

Figure 15: Renaissance campaign to prolong your wardrobe

In Montreal, Renaissance is collaborating with a network of partners to launch its textile waste reduction pilot project [32]. The pilot educates the public on how to extend the life of clothing by making wiser purchases. In addition to offering a map of all donation locations, the website is interactive, including quizzes to encourage users to learn about textile care and usage. With increasing knowledge, the propensity to reuse should rise. For a wider readership, the website also links to social media platforms like Instagram. If successful, this 2021 pilot will be expanded to other parts of Quebec.

Maintaining momentum and expanding these resources and initiatives will play a key role in encouraging more people to take responsibility for their wardrobes; it will also enable those looking to pass on or fix worn-out or damaged clothing. Additionally, the online presence of municipal and charity collaborations can aid in fostering public confidence in the programmes.

4.2. Where we could be and how we get there

To improve public communications and encourage behaviors aligned with the overarching aims, several approaches and action areas have been identified as below.

Promote the use of accurate, consistent definitions and terms at a national level

The term "recycling" is used inconsistently throughout the many communication pieces studied in this report. Definitions of recycling, explanations about the processes used and information on the types/quality of recycled outputs are often missing. This could misinform the public about where their donations are going and risk creating distrust in the community, especially considering the limited size of the textile recycling industry in Canada (e.g., differentiating 'sent for recycling' vs. actual or real recycling as measured by the recycled outputs).

Incorporate simple, fact-based narrative about the full benefits of taking care of textiles, repair and reuse

Research on behavioral change points identifies three success factors: '(perceived) ability', 'motivation', and 'prompt' [33]. Whereas development of infrastructure and municipal-industry partnerships help tackle the first and the last factors, highlighting the full benefits of participating in a circular economy can help motivate the public to action. The benefits of circular economy and textile reuse have been elaborated in the white paper produced from this project [34]. Information on how to make better purchasing options is also vital to ensure that consumers are prioritizing fewer impulse purchasing and focusing on investing in high quality textiles.

Case Study #4:

patagonia

This outdoor-wear company is well-known for promoting used clothing and asking its consumers to think twice before making new purchases. It's vocal about its environmental efforts which are designed to resonate with its target audience.

Their website has a range of information on how to repair and care for the different products. In support of this, the company runs a *Worn Wear* campaign, a travelling repair centre which also engages on-the-ground with their customers.

Using multiple communication channels (including in-person events) and make it easy for the public to access information: To reach a wider audience, municipalities and charities should use a variety of different communication challenges (e.g., websites, social media, local newspaper). One caution to this is that this may

turn out to be resource-intensive; regions and charity groups may explore partnerships to pool resources and achieve scale.

Accessing information about reuse infrastructure such as donation points and repair events should be easy for the public to find. Existing systems could explore ways to streamline user interactions e.g., by incorporating visuals or interactive maps. On the ground in person events also help to build a sense of community around circular initiatives. This is also an opportunity for NACTR to share its expertise with municipalities and other local actors.

Table 9: Summary of recommendations and desired impact – public communication and education

Overarching ambitions	Desired impact through publication communication and education
Reducing waste going to landfill	✓ Increased public action on textile waste prevention.
Promoting charitable reuse and other reuse options	✓ Greater awareness among the public of the economic, environmental and social impacts individuals can support.
Ensuring high quality exports	✓ Create a circular culture around textiles and counter fast fashion business models. Over time, consumers will begin to purchase more durable items leading to a reduction in fast fashion items. This will likely improve the quality of textile exports.
Reducing overconsumption	

5. Improve and Optimize the Collection Infrastructure

5.1. The current Canadian landscape: collection

The Canadian secondary market comprises a range of stakeholders, as previously mapped in Figure 11. Constituents include large for-profit thrift stores such as Value Village, a range of different charities such as the Salvation Army Thrift Stores; charity and municipal collection points; and smaller independent thrift stores and consignment shops across all thirteen provinces and territories that collect textile waste from the public, retailers and businesses.

Charity and not-for-profit organizations make up the biggest group of collections, with the National Association of Charitable Textile Recyclers (NACTR) reporting that their members collectively have around 3,400 collection points [35] in Canada; Value Village has about 130 stores [36] nationwide. Figure 16 shows the number of

collection points in each province or territory. At a provincial level, Ontario as the most populous province represents the largest number (1,310 out of 3,400, or 39%) of these collection points, followed by other provinces such as Alberta (540 or 16%), Nova Scotia (375 or 11%) and British Columbia (306 or 9%).

Figure 16: Charitable collection points across Canada (according to NACTR data)

At the national level, the average density of charity collection station is 9 per 100,000 people. However, as shown in Figure 17, the provision of collection infrastructure is unevenly distributed across Canada. In regions such as Prince Edward Island, the Northwest Territories, Yukon and Nunavut, there are fewer than 1 collection point per 100,000 people. Whereas other provinces, especially those whose populations are at around 1 million (e.g., Manitoba, Saskatchewan and Nova Scotia), have significantly more collection points in relation to their population size, with Nova Scotia peaking at 37 per 100,000 people.

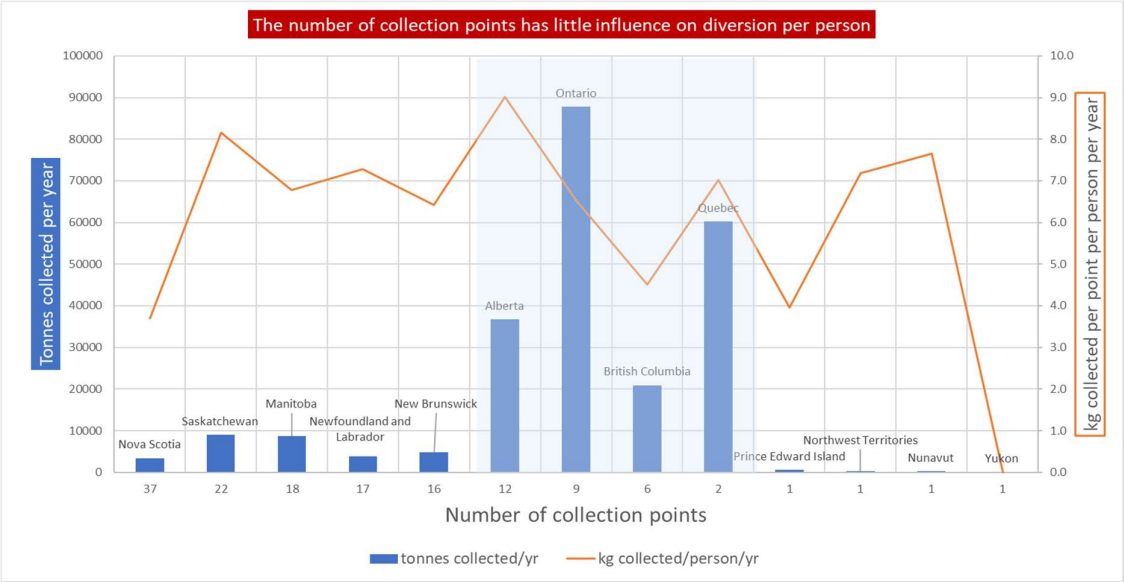

Figure 17: Charity collection point distribution and per person rates across Canadian provinces

Also overlain is the collection rate per person. This varies within a relatively narrow band and is not obviously correlated with collection point availability. The blue box highlights the highest population density regions. Here, there may be indications that more points could improve donations, but this would require further investigation into, say, the capacities and collection frequencies involved. In any case, Canadian collection rates per point stand up well in comparison with peer group nations. This itself, though, may indicate that the collection point infrastructure is saturating and could benefit from expansion.

It should also be pointed out that, because of the data limitations, this mapping does not reflect the specifics of which collection points within the NACTR network have the most uptake (in terms of quantities collected, or number of donation visits if in-store). With more consistent data collection, NACTR members could monitor the track record of various collection channels (e.g., donation bin collection, store donation, municipal partnership collection points, etc.) and, potentially, conduct a benchmark analysis to draw learnings from the best performers. This is a necessary precursor to decisions on where improvements to capacity might be needed.

It is important to reiterate that the number of collection points accounted for in the figure covers only those from the NACTR members. Therefore, the results likely overestimate the collection rate per point. Additionally, the total quantity of textile waste diverted from landfill does not cover textiles resold through peer-to-peer platforms or consignment shops and therefore are delayed from entering the waste management system.

Appendix A contains further observations relevant to any future work to investigate the performance of the collection network.

5.2. The current Canadian landscape: processing after collection

Beyond collection, there is a significant knowledge gap in the country's current capacity for storage, sorting and processing for downstream operations. Without a comprehensive understanding of this baseline, it will be difficult to gauge how the value chain might respond to potential policy interventions gaining traction in other jurisdictions. Such interventions include EPR schemes [37], landfill ban of biodegradable waste [38], and export restrictions [39].

Did you know?

In France there are 67 collection points per 100,000 inhabitants. Each collection point collects around 5000 kg a year which has created the capacity required to divert 39 % of textiles from landfill or incineration [23].

There are a reported several dozen operators with the potential to handle textile waste in the country [22]. However, there is little information on their size. With very few global sorters relying on fiber sort technologies, sorting is often done manually. For comparison, according to a recent mapping of textile sorters and recyclers in Europe, the annual capacity for manual sorting ranges from 5,000 to 100,000 tonnes/year depending on the size of the organization. This is against the backdrop of an estimated 1.2 million tonnes of textile waste manually sorted in Europe [40], compared to the Canadian estimate of 150,000 tonnes of textile waste exported annually [Appendix A]. Engagement with the key actors that supply recycling services to NACTR members and leading for-profit actors will be key to gaining more visibility into the current or ultimate capacity for manual sorting in Canada.

5.3. Where we could be and how we get there

Optimize the existing textile collection infrastructure: It is advisable for charities and municipalities to start with establishing a local baseline and explore whether there is potential to optimize the current operation**.** As outlined above, more detailed data collection and regular benchmarking exercise is needed to inform decisions such as targeting certain low-performing collection points, or strategically expanding in certain areas in response to rising demand for the collection services.

An accessible collection network nationwide, underpinned by sufficient transport, storage and sorting/grading capacity for reuse: The current national average for charity collection points is 9 per 100,000 people. Regions and municipalities below this average should take stock of their local infrastructure and analyze the need additional capacity considering questions such as:

- How much textile is present in the municipal solid waste stream?
- What are the needs and expectations of the communities and other stakeholders?
- What would be an ambitious and achievable textile diversion targets for my jurisdiction and what additional capacity is needed?
- What would be the costs and benefits (in economic, environmental and social terms) to invest in the gradual deployment of new collection infrastructure?

As seen in France and closer-to-home examples such as the City of Markham Council's Charity Partnership Textile Diversion Program, increasing the number of collection points and improving the accessibility of this infrastructure are a key driver in increasing textile waste collection. With an estimated 35 collection stations per 100,000 residents, much higher than the provincial average of 9, the City of Markham Council's partnership model has prevented 4000 tonnes of textile waste from ending up in landfills. This expansion in infrastructure and resident participation has had a cascading impact on the value chain, prompting the city and its partners to explore the potential of expanding its existing logistics and processing facilities to handle the increasing level of textile collection.

Another analysis, from Edmonton suggests that 55.4% of students preferred donating textile directly to charity organizations, and 33,9% drop off textiles in donation bins [40]. Although it is unclear if this is applicable across all regions and different demographics, the strategic installation of collection bins remains a proven tactic for encouraging responsible disposal behavior by making it convenient for the residents. Markham's partnership model could also serve as a blueprint for charities to scale up their reach whilst keeping the associated operational cost (such as rentals, wages and electricity bills) to a moderate level, in comparison to traditional brick and mortar charity thrift stores. Cities could also take inspiration from the refashionNYC program and trial collection services from multi-residential buildings or other buildings with high foot traffic.

Case Study #5

refashionNYC [41]

Making donating easy for the public

To increase the number of donation bins and collection rates, refashionNYC has partnered with New York City's Department of Sanitation and Housing Works to make textile donations easy through in-building services.

This program aims at installing donation bins in:

- Large apartment buildings
- Office buildings
- Commercial businesses
- Schools and institutions

Cascade developments throughout the secondary market in line with increasing collection: As mentioned above, practitioners involved in Markham's pioneering waste diversion programs have cautioned that additional collection capacity needs to be organically grown and supported with matching level of investment in logistics and processing capacity. Therefore, collection infrastructure may only be the beginning for municipal partnerships. Engagement and insights into the amounts collected or processed from charities and other collectors, as well as local sorter/graders, will be crucial for future development and implementation of regional circular economy strategies.

Table 10: Summary of recommendations and desired impact - development of physical infrastructure

Overarching ambitions	Desired impact through development of physical infrastructure
Reducing waste going to landfill	✓ Optimize the existing infrastructure by capturing key performance data (such as quantity, quality or suitability for reuse, numbers of usage/visits) linking back to the point of collection. ✓ Improve accessibility and convenience for the public to donate textiles by increasing the number of collection points, for example through municipal partnerships and collaboration with high foot traffic buildings and public spaces.
Improve the quality and transparency of post-consumer textile trade:	✓ Phase the development of additional capacity in the downstream logistics as well as sorting, grading, and recycling processes in response to increasing collections.

6. Recommendations for Maximising the Potential of Infrastructure

These recommendations build on the complementary Appendix A on material and economic flows of used textiles. That report recommended a suite of actions by the NACTR membership, critically in collaboration with municipal and regional authorities, to improve the quality and transparency of the post-consumer textile trade.

This report on the textile reuse infrastructure and how to boost its effectiveness identifies a further three critical elements for action:

Element 1. **Establish a common front and common standards** to improve operator effectiveness (from diversion through productive reuse).
Element 2. **Promote charitable reuse** to fully engage the potential donators of used textiles, highlight the opportunities of the secondary textiles market, and **avoid unnecessary over-consumption**.
Element 3. **Improve and optimize the collection infrastructure** to reduce waste sent to landfill or incineration.

Note that in the Key Findings report, the consolidated actions from the two supporting reports are described as Focus Areas.

6.1. Element 1: Establish a common front and common standards to improve operator effectiveness

Future focus should be on increasing collaboration between municipalities, NACTR members and other players. Further cooperation can help scale the partnership model and amplify its impact by sharing knowledge and best practices to establish new norms.

KEY RECOMMENDATIONS:

- **Disseminate learning to enable adoption of best practices across municipalities and charities.**
- **Increase visibility** of collection points, product life extension guidance, and public education of donation benefits
- **Adopt standards and minimum requirements** across leading collectors to create competitive advantages for downstream operators. Partnerships and collaboration, particularly with municipal authorities, could drive more transparency on sorting/grading and exporting processes.

6.2. Element 2: Promote charitable and other forms of reuse

Information, advice and encouragement are key elements of improving used textile diversion but will require action across broad fronts and multiple channels.

KEY RECOMMENDATIONS:

- Increase public action on textile waste prevention. To reach a wider audience, municipalities and charities should use a variety of different communication challenges (e.g. websites, social media, local newspaper); for efficiency, regions and charity groups should explore partnerships to pool resources and achieve scale.
- Raise awareness among the public of the economic, environmental and social impacts individuals can support. This can draw upon, for example, common messaging about greenhouse gas impacts using standardized methods.
- Promote an alternative to fast fashion through thrift and reuse.

6.3. Element 3: Improve and optimize the collection infrastructure

There are indications that more collection points in some regions could boost collection rate although this requires further investigation. Boosting points will also require publicity in parallel to ensure effective uptake, and, subsequently, improvements to the onward processing capacity.

KEY RECOMMENDATIONS:

- **Optimize current infrastructure usage:** Before decisions on building additional capacity can be made, current infrastructure performance needs to be evaluated and optimized; this can be enabled through better data collection on quantities and the quality of textiles collected at each collection point.
- **Plan to expand collection point density:** Work in partnership with municipalities to encourage donations over landfill via an expanded collection network.
- **Use a phased approach to growth:** Ensure that downstream operations are supported to grow to match an increased collection rate.

7. Annex to Appendix B: Observations on Collection Network

The following observations are relevant to future investigation of the collection network:

- Four regions show high average diversion level per NACTR-affiliated collection point – Quebec, Prince Edward Island, Northwest Territories, and Nunavut. This could either point to an infrastructure gap and therefore strain on the existing infrastructure or indicate a thriving secondary textile market outside of the NACTR network (e.g., by collection through other channels such as donations to local charities, social enterprises and for-profit outlets.

References

1. Environment and Climate Change Canada. *Municipal solid waste and the environment.* 2020.
2. —. *Municipal solid waste and the environment.* 2020 (updated 2021).
3. thredUP. Consignment 101 | thredUP. *thredUP.* [Online] https://www.thredup.com/cleanout/consignment..
4. Environment and Climate Change Canada. Solid waste diversion and disposal. *Government of Canada.* [Online] 2015. [Cited: 9 May 2023.] https://www.canada.ca/en/environment-climate-change/services/environmental-indicators/solid-waste-diversion-disposal.html.
5. Statistics Canada . Waste materials diverted, by type and by source. *Statistics Canada.* [Online] 2022. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810013801.
6. Statistics Canada. Disposal of waste, by source. *Statistics Canada.* [Online] 2020. https://www150.statcan.gc.ca/t1/tbl1/en/tv.action?pid=3810003201.
7. Deloitte & Cheminfo Services Inc. Economic study of the Canadian plastic industry, markets and waste : summary report to Environment and Climate Change Canada. *Government of Canada.* [Online] 2019. [Cited: 8 May 2023.] https://publications.gc.ca/site/eng/9.871296/publication.html. ISBN 9780660304472.
8. *Textile waste in Ontario, Canada: Opportunities for reuse and recycling.* Weber, S., et al. 106835 , 2023, Resour. Conserv. Recycl. , Vol. 190.
9. Cheminfo Services Inc. *Characterizing Reuse, Recycling and Disposal of Textiles in Canada.* 2022.
10. Australian Fashion Council & National Clothing Product Stewardship . Scheme Milestone 1.4: Clothing Data Report. *Google Docs.* [Online] 2022. Australian Fasion Council. National Clothing Product Stewardship https://drive.google.com/file/d/1KjX6pRsPI9WPjFW1ANJXz0o4XNyigoCB/view?usp=sharing&usp=embed_facebook.
11. Drennan, K. Textile Recycling Feasibility Study | Fashion Takes Action. *Fashion Takes Action.* [Online] 2021. Drennan, K. https://fashiontakesaction.com/articles/textile-recycling-feasibility-study/.
12. The Rag Factory . Bulk Rags. *The Rag Factory* . [Online] https://theragfactory.ca/pages/bulk-rags..
13. Innovation, Science and Economic Development Canada. Trade Data Online. *ic.cg.ca.* [Online] https://www.ic.gc.ca/app/scr/tdst/tdo/crtr.html?grouped=INDIVIDUAL&searchType=KS_CS&naArea=9999&countryList=ALL&toFromCountry=CDN&reportType=TE&timePeriod=24%7CMonthly+Trends&currency.
14. IBISWorld. Industry Market Research, Reports, and Statistics. *IBISWorld.* [Online] https://www.ibisworld.com/default.aspx.
15. Statistica. Secondhand apparel market value worldwide 2021-2026. *Statistica.* [Online] Statistica. https://www
.statista.com/statistics/826162/apparel-resale-market-value-worldwide/.
16. Future Market Insights. Secondhand Apparel Market. [Online] https://www.futuremarketinsights.com/reports/secondhand-apparel-market.
17. United States Environmental Protection Agency. Textiles: Material-Specific Data. *www.epa.gov.* [Online] 2022. https://www.epa.gov/facts-and-figures-about-materials-waste-and-recycling/textiles-material-specific-data.

18. Greenpeace Germany . *Poisoned Gifts* . Hamburg : Greenpeace , 2022.
19. Ellen MacArthur Foundation. *A New Textiles Economy: Redesigning fashion's future.* 2017.
20. IPCC. AR6 Synthesis Report - Headline Statements. [Online] 2023. https://www.ipcc.ch/report/ar6/syr/resources/spm-headline-statements.
21. Government of Canada. Canada's Climate Plan. [Online] 2023. https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/net-zero-emissions-2050.html.
22. ChemInfo. *Characterizing Reuse, Recycling and Disposal of Textiles in Canada.* s.l. : Environment and Climate Change Canada, 2022.
23. Wilson, Adrian. Learnings from France on textile waste and EPR. *Innovation in Textiles* . [Online] 2021 September 2021. [Cited: 22 03 2023.] https://www.innovationintextiles.com/learnings-from-france-on-textile-waste-and-epr/.
24. City of Markham. Textiles. *Markham.ca.* [Online] https://www.markham.ca/wps/portal/home/neighbourhood-services/recycling-garbage/services/textiles.
25. Metro Vancouver. metrovancouver. *Reduction & Reuse Programs: Clothing Waste.* [Online] [Cited: 28 03 2023.] http://www.metrovancouver.org/services/solid-waste/reduction-reuse/clothing-waste/research/Pages/default.aspx.
26. —. Where can I donate or recycle? *metrovancouver.* [Online] 2022. [Cited: 2023 03 28.] http://www.metrovancouver.org/services/solid-waste/reduction-reuse/clothing-waste/think-thrice/reuse/where-to-donate/Pages/default.aspx.
27. European Clothing Action Plan (ECAP) . *Used Textile Collection In European Cities* . 2018.
28. Repair Cafe Toronto. Repair Cafe Toronto. *Repair Cafe Toronto.* [Online] [Cited: 28 03 2023.] https://repaircafetoronto.ca/.
29. Clothing Repairathon. Clothing Repairathon. *Facebook.* [Online] [Cited: 28 03 2023.] https://www.facebook.com/groups/repairathon/.
30. Charity Retail Association. TRUST – Trader Recycling Universal Standard. [Online] 2021. https://www.charityretail.org.uk/trader-recycling-universal-standard/.
31. WRAP. M&S and Oxfam: Shwopping. Ordinary clothes made extraordinary. [Online] 2020. https://wrap.org.uk/sites/default/files/2022-06/WRAP-Oxfam-M%26S-Shwopping-case-study.pdf.
32. Renaissance. Textile waste reduction pilot project. [Online] Renaissance collaborates with a network of partners, including Vestechpro, a clothing research and innovation centre based in Montréal. .
33. Standford Behavior Design Lab. Fogg Behavior Model. [Online] 2023. https://behaviordesign.stanford.edu/resources/fogg-behavior-model.
34. Oakdene Hollins, NACTR. Reduce, Reuse, Rewear: Highlights of the textile secondary market in Canada. [Online] 2023. https://nactr.ca/wp-content/uploads/2023/02/NACTR-Reduce-Reuse-Rewear-1.pdf.
35. NACTR. Donation Site Locator . *National Association for Charitable Textile Recyclers* . [Online] [Cited: 22 03 2023.] https://nactr.ca/donation-site-locator/.

36. **Rentech Digital.** Number of Value Village stores locations in CANADA. *Smartscrapers.* [Online] 21 04 2021. [Cited: 28 03 2023.] https://rentechdigital.com/smartscraper/location-reports/valuevillage-locations-in-canada.
37. **Refashion France.** I recycle. *Refashion.* [Online] [Cited: 22 03 2023.] https://refashion.fr/citoyen/fr/jerecycle.
38. **Climate Change Committee.** Reducing UK emissions – 2019 Progress Report to Parliament. [Online] https://www.theccc.org.uk/publication/reducing-uk-emissions-2019-progress-report-to-parliament/.
39. **European Commission.** EU Strategy for Sustainable and Circular Textiles. [Online] https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52022DC0141&from=EN.
40. *Textile waste in Ontario, Canada: Opportunities for reuse and recycling.* **Sabine Weber, Olaf Weber, Komal Habib, Goretty Maria Dias,.** s.l. : Resources, Conservation and Recycling,, 2023.
41. **NYC Department of Sanitation and Housing Works.** refashionNYC. *Housing Works.* [Online] [Cited: 22 03 2023.] https://housingworks.org/donate/re-fashionnyc.
42. *Carbon Metric Publications.* **Zero Waste Scotland.** s.l. : Zero Waste Scotland, 2023.