

Resourceful ME

Exploring multiple forms of value
in Maine's reuse sector



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On Variable Forms of Value: Executive Summary

Mainers are a thrifty bunch—that much we’ve gathered. Our research participants from throughout Maine know this too!

The 5 year “Resourceful ME” research project set out to explore various forms of value generated by Maine’s reuse economies as well as the implications for sustainability policy. While Maine’s reuse economy is unique, there are lessons in our findings that travel far beyond state borders.

Our mixed methods study included extensive literature reviews, more than 150 interviews with reuse organizations (businesses, non-profits, local governments), national economic analysis of county-level data on reuse businesses, case study analyses of 30 households, in-depth participation in reuse markets as volunteers in community thrift shops, and surveys of nearly 800 Maine households and businesses.

Some of our results confirmed what studies have found in other places. Notably, we join many researchers in confirming that reuse activities are often highly social and thus difficult to measure since many exchanges take place outside of formal markets. Other results were unexpected—either because there is very little research on the topic, or because Maine (colloquially known as the “attic of New England”) is home to a particularly vibrant culture of reuse. While it is difficult to capture all findings generated over the five-year project in a short report, here are some high-level highlights:

- Studies from around the world suggest that reuse can reduce the demand for new products, offsetting materials extraction, production inputs, emissions, and associated pollution. These environmental savings can also yield significant economic gains by reducing materials inefficiencies.
- Reuse can deliver significant benefits to local communities, these localized forms of reuse should be recognized and supported, but it is also important to build consideration of equity into reuse programming—from inception.
- Reuse can be encouraged by a suite of policies up and down stream, from increased landfill fees to incentives for remanufacture and community spaces for exchange.

While it is tempting to speak the language of money, tallying how much reuse economies are worth in dollars and cents, reducing our rich results to numbers does a disservice to our research participants and all we’ve learned from them over the past five years. We thus outline various forms of value in this report and draw attention to the need to design reuse policy with sociality, community health, and social equity in mind.



Waste Not...Want Not!

Our surveys and interviews make it abundantly clear that waste reduction is a significant motivator of reuse behaviors. Sixty percent of the 80 reuse organizations we surveyed cited environmental concerns as part of their motivation for participating in reuse markets. We also had more than 600 Maine households participate in our survey. They too cited waste prevention and environmental protection as a primary motivator for offering (82%) and getting (71%) used goods, suggesting that these concerns can be productively leveraged to encourage, incentivize, and support reuse.

Waste Reduction

The average American throws away nearly 5 pounds of waste every day. Multiplied by the number of days in the year and the number of people in the United States, the number is truly staggering – almost 300 million tons of waste is buried or incinerated in the US each yearⁱ. Studies suggest that discarded consumer goods constitute approximately 75% of landfilled waste. A significant portion of this waste could be reused, reducing municipal solid waste by approximately 25%ⁱⁱ and leading to less pressure on landfills, economic savings and the potential to reduce resource demands associated with the production of new goods.



Climate Change

One study, for example, estimated that up to 95% of building materials landfilled each year could be reusedⁱⁱⁱ. The authors estimate that if buildings were designed with reuse rather than recycling in mind, 88% of the global warming potential of these materials could be avoided. Another study focused on textiles estimated that, of the 17 million tons of textile waste delivered to landfills each year, approximately 380,000 tons is reusable clothing. If this clothing were reintegrated into markets, there is the potential to save nearly 3 million tons of CO₂ equivalents. This is roughly approximate to the total carbon footprint of 4.5% of the US population^{iv}.

Resource Use

Studies focused on various goods— from clothing and books to furniture —suggest that from an environmental perspective, the extension of an existing product’s lifetime leads to lower environmental impacts when compared to replacement with a new product. These savings include resource use (water, energy, materials) and potential for toxicity for the vast majority of goods. These benefits span the supply chain and also translate into economic savings. Some important exceptions include goods that require energy in their use phase, most notably “white goods” like refrigerators and small appliances^v that tend to be more energy efficient than older models.

The Economic Value of Reuse



The reuse sector is composed of much more than repair shops and antique stores. It includes a whole array of practices, many of which take place online, among friends, or in the informal sector. As a result, it is difficult to assess the full economic contribution of reuse exchanges. In an effort to try, our team sent a survey to a representative sample of Maine’s households (n=4,000) in 2018. The survey contained questions on expenditures for different forms of reuse. This information, was combined with official census data, allowing us to approximate weighted average expenditures by household (15% response weight).

The survey responses were geographically representative and controlled for income and qualifications. In total we estimate that Maine households, on average, spend approximately \$1018 each year on second-hand goods. Taking the official census data for the number of households in Maine we estimate **\$570 million a year** is spent on second-hand goods. This approach allows us to conservatively estimate direct expenditures on second hand goods only and does not take into account multiplier effects (job creation, local circulation of income, etc.).

The Economic Value of Repair

For goods to remain in circulation, there is a need to keep them in working order. Our survey of Maine households also asked residents about repair expenditures. Responses allowed us to extrapolate average household spending of \$280 per year on repair (excluding car repairs). Taking the household population of Maine from the census, we calculate that more than **\$156 million dollars per year** is being spent on repair. Using this spending figure along with census data on the repair sector we estimated total employment, labor income and multiplier effects. Multiplier effects include in-state economic activity supported by the expenditures of the repair sector, their suppliers, and the employees who work in these businesses.



To establish the multipliers, we used input-output framework that traces flows of expenditures and income through the economy with a complex system of accounts that are specifically tailored for Maine. The tool we used, IMPLAN is a well-established and widely used economic model that uses input-output analyses and accounts for over 500 industries to estimate regional and industry-specific economic impacts. Underlying the accounts is transaction data occurring between local businesses, spending patterns of households, and transactions occurring. The total impact below is the sum of the direct contribution plus these multiplier effects.

Table 1. Economic Contribution of Repair

	Direct Impact	Multiplier Effect	Total Impact
Output	\$156,777,880	\$51,545,991	\$214,323,871
Employment	1,311	610	1,921
Labor Income	\$59,680,795	\$29,739,025	\$89,419,820

Potential Economic Savings of Waste Avoided

In 2019 the average Mainer threw away 1,388 lbs. of garbage. This equates to nearly 3.5 pounds per person, every day. This per capita disposal rate has grown in recent years, up from .54 tons in 2017—a 2.5% increase which outpaced the state’s population growth (.4%) by a significant margin^{vi}. The waste we generate has significant costs. Landfills and incinerators charge local governments money to “tip” their residential waste at their facilities. As recycling markets have faltered in recent years, the cost to manage waste has grown substantially. Our work with municipalities here in Maine^{vii} suggests that waste management costs constitute one of the top three budgetary allocation categories for the majority of Maine municipalities. These expenses are funded by tax dollars—money that could be more usefully allocated to education, improved roads, or emergency services. While we often think about the economic contributions of an activity in terms of the income it generates, it is also important to think about the economic contributions of SAVING —both money and valuable materials.



Given that about 75% of municipal solid waste is generated by discarded consumer goods^{viii}, there is a significant opportunity to save money, materials, and increasingly scarce landfill space by extending product lifetimes through repair and reuse. An analysis of US EPA data estimated that reuse has the potential to reduce landfilled municipal solid waste by 25%. If we extrapolate that estimation to Maine, that would mean that we could divert about 25% of the MSW stream from landfills and incineration through repair and reuse. In 2019 Maine MSW disposed of (not counting construction and demolition debris) totaled 844,096 tons. One quarter of that would be 211,024 tons. Assuming a state average tipping fee of \$76.72 per ton, the **savings associated with avoided tipping fees alone equals a staggering \$16,189,761 for the state of Maine**. Of course, the savings associated with using goods longer also accrues to households and we’ve not yet accounted for all the environmental benefits associated with using products longer both at the end of life (reduced landfilling) and in offsetting demand for new product production and all the associated environmental costs (e.g. emissions, raw material extraction, energy use during production).



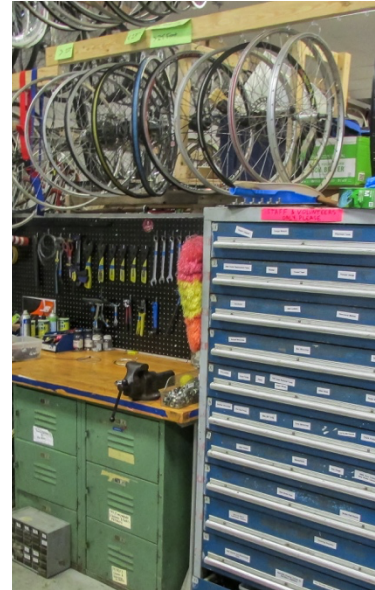
Several communities throughout the state are working to encourage reuse as a means to reduce waste, reuse resources, help families in need, and strengthen the community by hosting a transfer station swap shop. Always creatively and sometimes affectionately named, these transfer station’s “take it or leave it” shops can have a big impact. In Limerick, for example, the transfer station tracked all of the goods that came into and went out of their swap shop for an entire year. They found that the swap shop diverted more than 150 tons of waste. At current average tipping fees, that equates to an **\$11,500 savings for one small Maine community**.

Generating Connections & Circulating Objects

Our research demonstrates that localized reuse, in particular, has significant social value for reuse participants and communities. This value plays out as reuse offers opportunities to generate social connections – between organizations and individuals – through the circulation of used objects. That is to say, we see reuse helping to build social ties, as a means of practicing care for things and others, and as a key strategy to provide access to goods for families in need. During our research we found countless examples of organizations across the state that participated in reuse markets as a means to generate social value. Here are just two examples:

Generating Connections: Portland Gear Hub

Portland Gear Hub is a shop for used outdoor gear, including bicycles, camping equipment, and more. It is also a community hub and a space to find belonging. Proceeds from sales of used outdoor gear are used to fund scholarships to a local outdoor camp for youth. Inside the store we also see evidence of community connections forming. Portland Gear Hub hosts volunteer events, where community members help to repair and assemble children’s bikes that are given away over the holiday season. They also host repair events and workshops in their space with a goal of “being a community space. A place where, you know, anybody is welcome, you feel safe, you can ask questions” (Interview, 2016). This emphasis on sociality means that Portland Gear Hub does much more than rescue bikes from the landfill – it also contributes to community connections.



Circulating Objects: “Too Good to Toss”



Oftentimes reuse is socially-beneficial because it gives people access to things they need or want that they couldn’t otherwise find or afford. At solid waste transfer stations across the state, including the one in Columbia Falls, Maine, “swap shops,” “too good to toss” buildings, “take it or leave it” sheds, and “trash or treasure” barns offer opportunities for community members to access used items at no cost. This access often has important benefits for individuals, as described to us by a woman browsing for used items at the “Too Good to Toss” building. She told our team that she finds “really nice stuff here,” noting that “you gotta save wherever you can. I’m not working anymore and my husband has a manual labor job and we’re just trying to get by. I think most people around here about in the same position” (Interview, 2019). Connecting people with things they need is also a means of enacting community care and support.

These social dimensions of reuse can aid in the accumulation of “social capital” – the idea that our relationships have value^{ix} and can help us achieve collective goals^x. The exchange of still valuable goods can create diverse “regimes of value” depending on how people divest themselves of goods – as commodities, as donations, or as gifts^{xi}. All of these forms of reuse can offer social benefits to individuals and communities. However, it is important to note that our research also clearly demonstrates that the social benefits of reuse are not guaranteed. Networks of reuse can also replicate forms of social exclusion based on existing forms of discrimination^{xii} making it critical to ensure that equity and access are built into reuse organizations from their very design.

Positive Community Impacts

To better understand the meaning of reuse practices in their everyday context, members of our research team also embedded in local reuse institutions, spending over 6 months working with and volunteering for local non-profit reuse organizations in two small Maine communities. During this time, we came to understand how the non-profit reuse sector connects people to much-needed goods, but also offers social spaces for neighbors to gather and connect. Funds generated from the sale of used goods helped community members to get by during difficult times, and contributed to community and social infrastructure that enrich both communities. Here we briefly outline the economic contributions of these organizations to local communities while recognizing that many of these programs touched residents in ways that are not easily quantified.

Welcome to Housing, an Old Town-based furniture bank, accepts discarded, surplus, and unwanted furniture and home goods. These goods are redistributed to people who are moving into a house or apartment after experiencing homelessness, domestic abuse, a house fire, or other life disruptions. Welcome to Housing gives approximately **\$13,000** worth of used furniture and home goods to people in need each year - at no cost to individuals.

The Orono Thrift Store sells used clothing and home goods to fund medical care for local residents, community improvement projects, and programs within schools, senior centers, and natural areas. Each year the store generates approximately **\$40,000** in sales, all of which go directly to the community.

The Old Town/Orono Kiwanis Club holds an auction and yard sale in Orono every summer in addition to selling used books at a kiosk at the grocery store. Combined, these efforts generate over **\$45,000** worth of funds each year that are used to fund literacy programs, emergency health services, and other community causes.

The Holy Family Thrift Store in Old Town sells used clothes and home goods to support a food pantry for people in need. With about **\$40,000** in annual sales, Holy Family also offers a regular community supper and connects with local schools to ensure that students in need have access to personal hygiene products and clothing.

The University of Maine Clean Sweep Sale is held annually in May. Each year the sale generates about **\$6,000** in sales. Students leaving campus can donate items to the sale, whose proceeds fund the campus food pantry.

In total, the non-profit reuse sector in Old Town and Orono generates approximately \$148,000 annually - an amount that is nearly equal to Orono's annual parks and recreation budget. This sum accounts for the value of goods given away at no cost to people in need, as well as proceeds from the sale of used goods that are used to fund community suppers, food pantries, community programs, local infrastructure, medical assistance to locals, and much more. This network of reuse organizations provides a range of critical social services to community residents that extend beyond the financial.



Policy Considerations & Implications

Addressing Barriers and Enabling Reuse Markets Through Policy Support

Public policies have an important role to play to support reuse and repair businesses and practices. But it is essential that policy is responsive to community needs and well attuned to issues of equity. Our research results identified a wide range of barriers that businesses, non-profits and consumers face – ranging from lack of storage space for donated goods, time and convenience, a mismatch between supply and demand for used goods, poor public understanding of the benefits of reuse, and fears about the loss of localized reuse as national online resale platforms gain market share. Thoughtful policy can help to ensure that emerging reuse and repair programs and businesses are designed with attention to issues of equity. As Julian Agyeman^{xiii} has argued “social justice doesn’t simply happen... systems must be designed around equity and justice: these cannot be retrofitted.” Here we outline just a small sample of the policies and programs that could be implemented at various levels of scale. Some have significant precedence while others are just emerging.

Investments in repair training: Oregon’s strategic plan for the extension of product lifetimes identifies the co-benefits of a strong repair sector. In addition to reduced materials throughput and waste, repair and remanufacturing has the potential to create good jobs but there is a lack of skilled labor so the state proposed partnering with the Bureau of Labor and Industries, the Department of Education and Business Oregon to create apprenticeship programs in underserved communities.

Materials Exchanges: Governments at multiple levels of scale have worked to create materials exchanges. One excellent example is the Iowa Waste Exchange which, in 30 years of operation, has helped to match over 4 million tons of waste with those who could use it. The organization, run by the Department of Natural Resources, estimates that the exchange has saved residents nearly \$120 million since its inception.

Community Repair Cafes and Sharing Programs: Many communities have worked to support reuse and repair with programming including swap events, repair cafes, and sharing programs like tool libraries. These events not only move usable goods where they are needed, but they can also build a stronger sense of community.

Educational Campaigns: It is also important that residents come to understand both the benefits and opportunities for reuse. In Austin, Texas, residents can search a website for local businesses involved in the reuse, repair, and sharing. ReMade, ReShare, and RePair logos identify shops in a city-sponsored branding scheme.

Economic Incentives: The EU’s circular economy action plan includes a number of economic instruments that are designed to encourage reuse, such as a raw material resource tax, tax relief for reuse and repair and stronger economic penalties for products that are hard to handle at the end of their useful life. Sweden has implemented tax breaks for families that opt to have an appliance or product repaired rather than replaced.

Right to Repair Legislation: Several states and local governments have been actively involved in advocating for right to repair legislation which would require businesses to ensure their products can be repaired by consumers. These rules typically include provisions to ensure access to parts, manuals, and schematics.

Standards & Requirements: Some states have put requirements for reuse into product standards or permitting processes. For example, California’s Green Building Code requires projects to recover at least 65% of all nonhazardous construction or demolition waste. Another option to increase product lifetimes is to mandate minimum warranties on products that are ecologically impactful.

Procurement Targets: States can also lead by example, setting targets for procurement that encourage the purchase of second hand and refurbished goods for state offices.



- ⁱ EPA. 2020. "Advancing Sustainable Materials Management: 2018 Fact Sheet." EPA 530-F-20-009. Washington, DC: United States Environmental Protection Agency. https://www.epa.gov/sites/default/files/2021-01/documents/2018_ff_fact_sheet_dec_2020_fnl_508.pdf
- ⁱⁱ MacBride, Samantha. 2011. *Recycling Reconsidered: The Present Failure and Future Promise of Environmental Action in the United States*. Cambridge, Massachusetts: MIT Press
- ⁱⁱⁱ Minunno, Roberto, Timothy O'Grady, Gregory M. Morrison, and Richard L. Gruner. 2020. "Exploring Environmental Benefits of Reuse and Recycle Practices: A Circular Economy Case Study of a Modular Building." *Resources, Conservation and Recycling* 160 (September): 104855. doi:10.1016/j.resconrec.2020.104855.
- ^{iv} Zamani, Bahareh, Magdalena Svanström, Gregory Peters, and Tomas Rydberg. 2015. "A Carbon Footprint of Textile Recycling." *Journal of Industrial Ecology* 19 (4). Wiley-Blackwell: 676–87. doi:10.1111/jiec.12208.
- ^v van Loon, Patricia, Derek Diener, and Steve Harris. 2021. "Circular Products and Business Models and Environmental Impact Reductions: Current Knowledge and Knowledge Gaps." *Journal of Cleaner Production* 288 (March): 125627. doi:10.1016/j.jclepro.2020.125627.
- ^{vi} Maine DEP. 2021. "Maine Solid Waste Generation and Disposal Capacity Report for Calendar Years 2018 & 2019." Augusta, ME: Maine Department of Environmental Protection. <https://www.maine.gov/tools/whatsnew/attach.php?id=3898411&an=1>.
- ^{vii} Blackmer, Travis, George Criner, David Hart, Cynthia Isenhour, John Peckenham, Chet Rock, Avinash Rude, and Linda Silka. 2015. "Solid Waste Management in Maine: Past, Present and Future." White Paper. University of Maine Senator George J. Mitchell Center for Sustainability Solutions.
- ^{viii} EMF. 2013. "Towards the Circular Economy Vol. 2: Opportunities for the Consumer Goods Sector." Ellen Macarthur Foundation. <https://ellenmacarthurfoundation.org/towards-the-circular-economy-vol-2-opportunities-for-the-consumer-goods>.
- ^{ix} Putnam, Robert D. 2000. *Bowling Alone*. Simon & Schuster.
- ^x Coleman, James S. 1988. "Social Capital in the Creation of Human Capital." *American Journal of Sociology* 94: S95–120.
- ^{xi} Ong, Corinne, Lyle Fearnley, and Siow Boon Chia. 2020. "The Diversity of Divestment in Singapore: Junk Commodities, Charity Gifts, and Recycling Bins." *Environment and Planning, E, Nature and Space (Print)*, no. Journal Article: 251484862092456. doi:10.1177/2514848620924564.
- ^{xii} Berry, Bricanne, Brianna Farber, Fernanda Cruz Rios, Michael A. Haedicke, Sujan Chakraborty, Sara Sophia Lowden, Melissa M. Bilec, and Cindy Isenhour. 2021. "Just by Design: Exploring Justice as a Multidimensional Concept in US Circular Economy Discourse." *Local Environment* 0 (0). Routledge: 1–17. doi:10.1080/13549839.2021.1994535.
- ^{xiii} Agyeman, Julian. 2013. *Introducing Just Sustainabilities: Policy, Planning, and Practice*. Zed Books.