



Intervening in Rural and Small Community Waste Reduction Systems

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Abstract

In the recent tumult of change affecting the recycling and waste reduction industry resulting from the collapse of international markets, rural and small communities have a particularly stiff challenge. Where are the opportunities and what are the models that successful recycling and waste reduction efforts in rural and small communities are using to be successful? The focus of this project sought to connect what the authors learned from a vigorous exploration of best practices in Michigan and beyond to an emerging project in Laingsburg, Michigan. Perhaps a model could be developed for other rural and small community recycling/reuse programs trying to accelerate their programs to meet the challenges and demands of stakeholders in their communities. The methodology, and lessons learned are presented in this report as well as insights gained through a series of webinars utilizing some of the professionals they interviewed to help identify where future possibilities for success exist. The research offers useful direction for communities beyond our urban centers, considering how they could address local solid waste management concerns.

INTRODUCTION

This research project emerged out of an attempt by one of the co-authors to continue and expand a local all-volunteer recycling effort of 31 years in the area of Laingsburg, Michigan located in Shiawassee County, 25 miles northeast of Lansing, Michigan. As the COVID pandemic struck, the organization called a community meeting to see if there was enough interest to reinvigorate a program that was already struggling to continue. That meeting showed there was interest, so how best to restart the program was a central discussion point (see case study on page 16).

At the same time there were new grant funds being made available from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) for recycling programs. Also, recent research grant opportunities for examining the potential for enhancing the circular economy were available as a result of recently released federal funds. Terry Link, a leader with the Greater Laingsburg Recyclers and former Sustainability Director at Michigan State University, approached his recently retired fellow sustainability professional, Bill Stough, founder of the West Michigan Sustainable Business Forum, about embarking on a research proposal. It would attempt to identify important elements for building and sustaining rural and small community recycling and waste programs facing an uncertain future. This report is a result of that collaborative research.

The research is based on extensive interviews with recycling and waste reduction professionals from around the state and nation; visits to several community recycling and waste reduction sites in Michigan; and research into reports from government, industry, and other sectors in Michigan and nationally.

As researchers with extensive experience in waste reduction and recycling, the authors assessed key areas for investigation. They include, in no particular order:

- Organizational models
- Revenue streams
- Labor force
- Single stream vs. pre-sorted
- Material handling equipment
- Storage and processing space
- Essential partnerships
- Reuse, repair and other waste reduction options
- Importance of place-based development
- Changing the larger system

Each of us then developed potential lists of professionals for potential interviews which we enhanced as we moved ahead. The list of interviewees is appended (Appendix A). A questionnaire was developed to guide the interviews (see Appendix C); where scheduling was possible, both of the report authors were present.

METHODOLOGY

1. Research target programs in Michigan and across the nation with exemplary programs
2. Identify key individuals at each program to interview
3. Develop consistent interview questions - See Appendix B
4. Conduct interviews
5. Identify 4 to 6 sites in Michigan and visit them – See Appendix C
6. Develop and conduct webinars
 - a. Webinar 1 - identifying local opportunities, building relationships and community support
 - b. Webinar 2 - Alternatives for waste reduction beyond basic standard recycling
7. Prepare a final report

RESEARCH FOCI

- Ownership/partnership model of organization(s)
- Materials retrieved
- Processes and equipment used
- Revenue streams
- Single stream vs. dual streams
- Reuse, repair, rot and further zero waste
- Essential partnerships
- Importance of place-based development
- Changing the larger system

ORGANIZATIONAL MODELS

Our experience, further enhanced by our research, identified multiple organizational models for small and rural community recycling and waste production programs. It is evident that the major waste industry leaders find little, or at least not enough, profit to offer extensive recycling or waste reduction programs where quantities are lower and distances greater (insufficient route density) than in urban areas. Thus, rural and small communities have had to find a variety of ways to open, operate and sustain effective recycling and waste reduction programs on their own.

The Greater Laingsburg Recyclers program to this point has been an all-volunteer, local 501 (c)(3) nonprofit effort subsisting on donations from those who recycle. They make arrangements with local material haulers to bring trailers once a month to a public site for collected materials. The donations have, over the long haul, covered the costs charged by the haulers. There have been limited if any rebates on materials collected over the years, depending upon contracting vendor charges.

But this model is not a standard one based upon our experience and research. In many cases, local governments (counties, towns, or townships) may either operate or contract out to either a for-profit

company or a nonprofit organization for their local area’s recycling service. Most operations have a permanent site, often but not always with a building or buildings for collecting and/or processing the collected materials. Different communities may use general funds, a separate millage, landfill fees, or other mechanisms for funding operations. Many of the most effective community programs are financially supported by local governmental units.

PROGRAMS EXAMINED ON SITE:

- **Alpena Resource Recovery Facility (ARRF)** is directed by the Alpena County Recycling Board (ACRB). The ACRB, which sets the budget and policy, consists of 2 two voting members from the City of Alpena, 2 two voting members from the Charter Township of Alpena, and 2 two voting members from the outlying townships; it also has a non-voting liaison representative from the Alpena County Board of Commissioners. . The ACRB runs in conjunction with the Northeast Michigan Council of Governments (NEMCOG), which does the daily bookkeeping, accounting and grant writing. All employees of ARRF are independent contractors, hired by NEMCOG.



- **Bay Area Recycling for Charities** is a nonprofit that operates numerous independent programs, including building demolition and recovery of reusable building materials in the Traverse City area. It is governed by a board of directors and led by the founder, assisted by employees and volunteers. It also provides fee-based pick-up service for a wide range of materials throughout several counties.



- **Charlotte Area Recycling Authority** is a part of city government. The Recycling Center is funded through donations, sale of recyclable materials, and grants from Eaton County Resource Recovery.
- **Emmet County Recycling** cited by many professionals in Michigan as a model for rural and small cities, is a part of county government that serves not only Emmet County but also several other rural counties which contract with it for recycling services. Beginning in 2020, its employees became county employees. Clearly the larger governmental entity can consolidate and aggregate materials, personnel, and operations more easily than a small town or rural community alone. An extensive county ordinance guides its systems.



- **Midland Recyclers** is a nonprofit entity that is separate from government. Its own board of directors makes general policy decisions with an executive director and small staff, supported by a large number of volunteers who are used to supplement operations. A small annual fixed stipend is provided by Midland County, but they are otherwise independent of local government.



- **Recycle Livingston** operates in Livingston County, Michigan. It is a 30+ year nonprofit led by a board of directors and an executive director but largely dependent upon volunteers to staff their twice weekly recycling drives.

MATERIALS COLLECTED

Alpena Resource Recovery – Cardboard, corrugated and paperboard; paper including newspaper, magazines, office paper and junk mail; tin and aluminum; plastics #1-7; small metal objects can be dropped at ten different sites in the county. The main Resource Recovery facility takes other items (such as white goods), tires, and electronics seasonally, some of which require a fee.

Bay Area Recycling for Charities – Paperboard, ewspaper, junk mail, office paper, shredded paper, cardboard, pizza boxes, #1-7 plastic, Tetra pack (juice box, ice cream containers), aluminum foil, steel cans, and non-steel metals. Ink cartridges are regularly recovered through curbside service and drop-off. Many other materials are collected for special fees including electronics, tires, mattresses, fabric, food waste, vegetable oil and more.

Charlotte Area Recycling Authority – Tin and aluminum cans; other metals; clear glass; newspaper, phone books, junk mail, and magazines; books; office paper; boxboard and cardboard; PETE #1; HDPE #2 milk jugs; HDPE #2 colored; household batteries; cooking oil; clothes; and ink or toner cartridges.

Emmet County – The county runs 12 area drop-off sites that accept dual-stream materials. One stream takes paper, boxes and bags; the other takes “Containers” (bottles, jugs, jars, foil, tubs, cups, cans, cartons).

Similar service is available at curbside in some area communities. In addition, the main site accepts an additional 34 items, including fluorescent lights, tires, cooking oil, etc. many of which have additional fees.

Midland Recyclers – Paper (cardboard, boxboard, magazines, newspapers, books), #1 jars and bottles, #2 milk jugs, #2 colored w/seam, #3-7, plastic bags, vinyl siding, and polystyrene foam, tin cans and steel, aluminum, vinyl siding, clear glass bottles/jars, household batteries, electronics (but not tv's or monitors), and ink jet cartridges.

Recycle Livingston – Newspaper, cardboard, boxboard, mixed paper, #1 and #2 plastic, all metals, glass bottles and jars all colors, polystyrene, household batteries, and household textiles. For a fee they also accept latex paint and electronics.

REVENUE STREAMS

How are these services paid for? Our research finds there are as many ways as there are communities doing recycling. No organization relies solely on the sale of materials to fund their operations. Each community finds a different way to do this. In many cases local government offers a bulwark from which to provide the service, with some supplemental funding coming from some combination of sales, donations, or grants. In some cases, like Recycle Ann Arbor, the local government contracts out with the nonprofit service provider.

Alpena Resource Recovery Facility (ARRF) operates under Act 69 of 2005. The Alpena County Board of Commissioners has by resolution authorized a yearly \$20.00 per household surcharge to help fund the recycling program. Revenues from the sale of commodities go back to the recycling program budget.

Emmet County operations are a function of county government. The county manages agreements with other nearby counties, townships and towns. The county passed a flow control policy which requires waste haulers to take materials to the county transfer station where an approved tipping fee is charged, helping even the playing field for all haulers. For some materials there are specific fees charged, but they take in significant funds from sales, especially as they have grown their volumes, which helps subsidize acceptance of low-value materials such as glass.

Midland Recyclers offers yet another approach. They are a stand-alone nonprofit that is supported by the community through generous local foundations and citizens who donate. Their property was loaned to them for free by the county government soon after their start-up 30-plus years ago for as long as they operate.

Recycle Livingston uses yet another model. More than 50 percent of their income is generated by memberships and another 40 percent from fees charged to non-members and for selected hard-to-recycle items. Less than 10 percent comes from sales of materials.

Bay Area Recycling for Charities (BARC) has a uniquely innovative funding model which depends on a combination of grants, donations, fees for services, and retail sales. Services include residential / commercial / industrial recycling, special events recycling, composting, deconstruction and materials reclamation/sales, electronic waste collection and mattress recycling. BARC's pricing is structured to cover its costs for material handling and processing along with supporting costs for furthering its mission.

LABOR FORCE

Almost every recycling operation we saw welcomed volunteers. In the case of onprofit-driven operations, volunteers provide most of the labor force and use less equipment. This is not surprising. Except for managers, most employees are making below living wages and many do not receive any employee benefits. Some operations simply use contract employees for so many hours per pay period to keep their costs down.

Management of operations takes a combination of real knowledge and experience and a strong commitment to flying by the seat of one's pants given the quickly changing nature of material (commodity) markets. Every manager we met was simply dedicated to the proposition that waste needed to be diverted from disposal and that their organization was vital to community well-being. We suspect no one working in these small and rural communities on recycling and waste reduction is getting wealthy, however minimal. Their programs are supporting a workforce that is often constrained in finding higher paid employment opportunities. And, as almost all nonprofit and volunteer reliant organizations know, maintaining a sufficient, reliable volunteer base is a constant challenge.

These challenges, along with the move towards single-stream and dual-stream collections are pushing many organizations to seek more and more equipment to handle the sorting and moving of materials. This was formerly the work that volunteers dominated. Employees in these environments, besides managing operations, are primarily used to direct truck drop-offs, keep records, run material handling equipment (pallet jacks, balers, forklifts, bobcats, etc.), and monitor conveyor systems. Smaller, less skill-driven positions are assigned to sorting. Smaller operations need fewer skilled paid positions. It remains to be seen how the employment picture in recycling operations may shift as a result of the lingering pandemic. Small and rural recycling programs will likely continue to rely on less equipment and more volunteers if they are to continue. Should curbside recycling options increase in small and rural communities, the increases in material flows may nudge more recycling operations to move towards more investments in equipment to reduce labor. But few in this class have the funds to make those kinds of investments without outside support from government or foundations.

SINGLE STREAM vs. DUAL/SORTED STREAMS

One of the key questions we had at the beginning of our research was whether or not single-stream recycling operations were preferred over sorted, dual-stream or other variations of collection. The argument has long been made that the easier we make it for consumers to rescue recyclables from their landfill-destined trash, the more recoverable material we can salvage. Thus, the push earlier in this century to offer single-stream recycling. Single stream allows the consumer to put all their potential recyclables into one container (unsorted) which is then collected and mixed with others. There is plenty of research that affirms that belief. But there are a couple of perhaps unintended consequences that muddy that picture of a perfect system. Arguably the largest impact is on contamination.

Consumers often neglect to understand what is acceptable locally, especially in the world of plastics, which means someone needs to remove the contaminating materials so as not to contaminate the batch that is destined for purchase by a specific business for reutilization. As contamination rates increased, this led to rejection of batches and the cancellation of agreements between collectors and manufacturers. Most notable was the Chinese government decision to refuse a bulk of recycled materials from the U.S. But even within domestic markets, a recycled paper mill does not want pieces of glass, plastic, or metal in the recycled pulp they are trying to make into other products. Not only is the final product quality often diminished, but the equipment can be harmed by contaminants in the system, which can cost both lost time and expensive equipment repairs.

Industry standards now look to see contamination rates below 5 percent. Above that rate one will lose contracts to sell materials. And actually, of course, the lower the contamination the better, with premium rates and longer contracts more readily available for those who can meet those standards. But the second major consequence is the actual sorting of the comingled materials. Our visits to a variety of sites gave us a better view of this than simply reading the trade publications or news accounts. Single stream operations are becoming more and more mechanized, although all of the single-stream operations we visited utilize workers or volunteers for at least some of the sorting.

At one sizable operation we visited, most of the sorting was done by hand on a large concrete floor where trucks dumped the comingled materials they collected. Items could be sorted into gaylord boxes or other large containers or, with items like cardboard or boxboard, thrown into a pile that was then mechanically moved into a baler to be compacted and baled and then ultimately stacked for later delivery. Several of the others we visited have conveyor belt systems which use a combination of lasers, magnets, and humans to sort materials as they move ahead on the belt system. More recently we have seen the addition of robots which can identify and pick certain materials off the belt. We have yet to see or visit a totally human-free sorting system.

Which leads us to our concern that for general laborers the working conditions for this type of work are generally not of the kind that most anyone would make a career. Equipment is noisy, ventilation is less than ideal, and repetitive motions over many hours of work while standing on hard surfaces is uncomfortable at best. As those of us who have volunteered, even at sorted recycling sites know, consumers don't always either clean out the items they recycle or bother to keep garbage out of the mix. The intake of sordid smells and sticky or slimy or dripping contents makes the sorting by hand an at times disgusting enterprise.

Thus, we noted that several operations have moved to variations on the single stream. Dual-stream systems, like the one used by Emmett County, have their paper/fiber-based items in one stream (cardboard, mixed office paper, boxboard, magazines, junk mail, etc.), and containers of metal and plastic in another (glass is not universally accepted). This eliminates some of the sorting problems mentioned above.

The older method of consumer source-separated is still in use at some operations, especially those with staffed drop-offs, but also in some 24/7 unstaffed drop-offs. There is still some contamination in these operations, mostly in the confusing realm of plastics, but much of it is caught by staff at the drop-off point. Unstaffed drop-offs see significantly more contamination. Naturally, the consumer source-separated approach reduces overall recycling rates because fewer consumers are willing, or have the space, to separate and store materials. Curbside collections, which lessen the barriers for consumers to recycle, have moved more to single stream for ease of collection. Thus, the labor and costs of the separation moves from the consumer to collector, with the resulting potential increase in contamination.

IMPORTANCE OF PLACE-BASED DEVELOPMENT

There appears to be a continued push and pull on the single vs. dual vs. sorted systems. Total volumes, revenue streams, access to markets, and labor all coalesce to make the decision a very place-based one. No one size fits all. Small and rural community recycling programs, as noted earlier, generally do not hold sufficient profit maximization for waste industry giants to offer a recycling service. The usable volume retrievable per distance travelled makes sizable profit in a tumultuous industry challenging. Thus, more often than not a local nonprofit and/or government-run or -supported effort is required. These offer the anchoring stability necessary for any local program to succeed.

We saw the almost uniformly unique organizational structures employed in each community we visited. An impassioned leader is essential to overcome these challenges. Juggling the need for staffing, access to markets, a facility and/or suitable location, and supporting partners to launch a successful program requires a tenacious and persistent force. Even in the government-based programs, the history of those we interviewed demonstrated that there were committed citizens behind the initial impetus to launch a program. Often those same persons are still leading or otherwise significantly involved decades later.

Knowledge of the local community is important for helping to determine local opportunities and challenges, as knowing potential players and having community-based connections are essential for establishing and maintaining a healthy and sustainable program. In each community we visited there were both common recycled materials and unique items collected. Cardboard, newspaper, milk jugs, #1 plastic bottles and some other items were collected in almost every community. This is largely because there are broad based and developed markets for these materials. But in a few places where boating is a popular activity, for example, shrink wrap or plastic film is of such a significant quantity that there are cost recovery opportunities to collect it. In another community with a bit more density there is mattress recycling, and in another there might be vinyl siding, vegetable oil, fabric, or other items collected and processed due to the diligent efforts of local recycling leaders to identify a significant waste stream material with a potential localized market.

PARTNERSHIPS

None of the sites visited operate in isolation. In each there are multiple partnerships created on the collecting, selling, volunteering, financing, and marketing elements of the operation. From start-up on, relationships are built and partnerships developed in successful small and rural community recycling programs. Reaching out constantly to the local community increases the potential for rescuing more materials from the landfills to be directed to enterprises that can repurpose those materials. Meeting community stakeholders material recovery needs helps make a successful program and these needs are different for each locality.

In our view, based on interviews as well as our own experiences and additional research, the key components are the local community anchor institutions. Which institutions in the community are there for the long haul, not simply to make a sizable profit for corporate headquarters somewhere else? The easy answer is anchor institutions, like local government, schools, hospitals, and community foundations. These are also often among the largest employers in the community and often substantial producers of recoverable waste. If a community can get some if not all of these anchor institutions committed to a successful program, the chances of success are greatly heightened. With a good

foundation of community support, the retail, commercial and manufacturing partners can be more easily attracted to participate.

Partnerships can be both loose informal arrangements or more formal ones based upon signed contracts or agreements. Shared representation on boards, memorandums of understanding, contracts for service, or financial assistance or shared staffing can connect the partners based upon available needs, resources, and agreements. Establishing an open, transparent and shared process lessens the problems when changes in volatile markets and other challenges arise to challenge the program. Keeping the general public engaged, especially the volunteers and donors, is likewise crucial to a sustainable program.

REUSE, REPAIR, ROT AND ZERO WASTE

Recycling is, as most elementary school students could tell us, the third component in eliminating waste. The classic “Reduce-Reuse-Recycle” would have us focus upstream before we finally recycle. In more recent years the 3 R’s have been expanded to include Refuse – Repair – Rot, where refuse is the ultimate nonpurchase choice; repair rather than replace, and rot referring to composting the biological wastes. Several of the sites we visited and many others we talked with and unearthed through research have absorbed some of these activities in waste reduction beyond recycling. Midland Recycles has set aside space at their drop-off for items that can be reused, like shipping boxes and unwanted household items that still function. BARC is offering a demolition service and is recovering the materials for resale and for building “tiny houses.” They have also more recently begun collecting food waste and working with local farms to develop a local compost system.

One of the more vibrant and expansive examples, but not the only one, is the work coming out of the Appalachian-based ReUse Network. Jacob Hannah, who is Conservation Manager for the Coalfield Development Corporation and part of the network, detailed how the network self-organizes once it finds a community need or opportunity to create businesses. One activity is the need to remove century-old buildings in one of their participating communities. The network comes together to bid on the deconstruction of the building. If successful, the work requires deconstruction workers, heavy equipment operators, logistic workers and warehouse space. The valuable materials recovered are taken to a woodcraft shop where they are converted into new raw materials by skilled craft-persons and utilized for making furniture and other saleable items in local retail stores.

The ReUse Network uses this same approach for other community needs. The fundamentals of the network are collaborative collection, aggregation and education. All three aspects are served by ongoing ReUse Corridor events where materials and reusable items are dropped off. These are supplemented by piggybacking on events planned by other like-minded organizations, such as community fairs and school events. Each event can collect as much as five tons of materials. It takes two workers and seven volunteers per event. In 2020, the ReUse Corridor participants aggregated 43,000 tons of materials and products.

Once aggregated, truck trailer loads are shipped to processing and/or end-use manufacturers within the region. Mattresses, electronic scrap, source-separated organics, textiles, wicker baskets, and corrugated cardboard create a supply chain for industry. Each member enterprise also acts as a drop-off site for materials needed by other ReUse Corridor member facilities. Thus, each enterprise creates a demand for materials it needs and acts to aggregate the supply of targeted materials for other members – a true sharing network.

Perhaps more importantly is the job creation model at the base of the ReUse Network. Employees begin with a living wage, are given 33 hours of training, attend to some higher education (paid) for 6 hours/week and 3 additional hours/week of life skills education. Some 300 trainees are in the network.

Although the ReUse Network is organized as a regional initiative covering portions of several states, it offers important lessons for more local programs on how to improve their approach to waste reduction, recycling and employment for their residents. Basic elements include an anchor organization to identify, seek, and manage funding; a community needs assessment to identify capabilities and needs; and development of a collaborative, self-organizing philosophy to strengthen area weaknesses and leverage area strengths to the benefit of all involved. Such an approach by local and small community waste reduction programs offers the potential to lower costs, improve the quality of employment opportunities and divert usable materials to productive and profitable uses.

Neil Seldman, Waste to Wealth Program Director at the Institute of Local Self Reliance, shared numerous examples of waste reduction efforts nationally beyond recycling including the ReUse Network, St. Vincent DePaul Lane County (OR), ReUse People (San Diego), Second Chance (Baltimore), and Recycle Force (Indianapolis),etc. .

CHANGING THE LARGER SYSTEM

Donella Meadows famously suggested that there are key leverage points in a corrupted system where strategic intervention can have a major impact on changing the system.

(https://www.donellameadows.org/wp-content/userfiles/Leverage_Points.pdf)

While the authors do not claim to have identified all of the major leverage points to correct the rural and small community recycling/waste reduction problems facing such programs, we believe the following issues identified in our research will help communities and nonprofit organizations improve their success in reducing waste disposal of valuable materials and increase community well-being.

- Major waste industry leaders find little, or at least not enough, profit to offer extensive recycling or waste reduction programs in rural and small communities.
- When there is a recycling service, many nonurban governmental units (counties, towns, or townships) may either operate or contract out to either a for-profit company or a nonprofit organization for their local area's recycling service. If not, local recycling services struggle to survive.
- For the most part rural and small community recycling operations concentrate on collecting the standard materials (i.e., paper, some plastics, ferrous and non-ferrous metals) although emerging programs are expanding materials and services to address specific place-based needs (e.g., boat-wrapping film, mattresses, deconstruction of old buildings, composting).
- To add value (and revenue) to their activities, rural and small community programs must find successful ways to aggregate and densify profitable materials to more than pay for the logistics needed to take the material to markets.

- In order to find laborers needed to operate a successful waste reduction/recycling program, management must provide a clear vision of how an entry-level position can lead to a living-wage or better career.
- Whether the program uses source separation, dual- or single-stream collection, a low contamination rate for the collected materials is a necessity, using either human or machine labor.
- No one approach fits all. Total volumes, revenue streams, access to markets, and labor all coalesce to make the decision on how best to proceed a very place-based one. Meeting community stakeholders' material recovery needs help make a successful program and these needs are different for each locality.
- None of the sites visited operate in isolation. In every one there are multiple partnerships created on the collecting, selling, volunteering, financing, and marketing elements of the operation. From start-up on, relationships are built and partnerships developed in successful small and rural community recycling programs.
- Identify and involve anchor institutions to support funding; a community needs assessment to identify capabilities and needs; and develop a collaborative, self-organizing philosophy to address area weaknesses, and leverage area strengths to the benefit of all involved: Such an approach by local and small community waste reduction programs offers the potential to lower costs, improve the quality of employment opportunities and divert usable materials to productive and profitable uses.
- Reuse, Repair and Rot (composting) may be the future of community “recycling” programs by refocusing first on reuse opportunities, secondly on repair, thirdly on composting opportunities and lastly on recycling what can't find a place in the community in the previous three R's.

LOOKING AT THE BIGGER PICTURE – FINAL THOUGHTS

As we delved deeper into the rural and small community solid waste challenges, it became clearer to us that there needs to be a rethinking of waste reduction orientation that perhaps can be driven by the experience and practice of rural and small community recycling programs. Large urban areas operate in a different world of solid waste realities than their often poorer cousins in the hinterlands. In urban areas, handling solid waste offers bigger profits to be pursued and pocketed due to larger commodity streams and denser population logistics. The drive for profit shifts orientation away from the societal and common good that is at the heart of what drives many, if not most, of the founders of rural and small community recycling and waste reduction programs.

The rise of interest and engagement around ‘circular economy’ design fits well with waste reduction efforts. Since endless growth on a finite planet is impossible, reframing the system towards closed-loop, steady state orientation offers a better long-term sustainability potential than consume and bury. At the beginning of the design process, if the intention is for repair or reuse, or if recapture is a focus, there are savings to be shared, new employment opportunities, and potentially some community strengthening benefits to be gained. The circular economy approach looks for connections and interdependencies at the local level. This approach nurtures stronger social capital within the community while also looking for partnerships within the region that foster effective scaling of material flows. Since both the

environmental and financial costs of moving materials greater and greater distances reduces sustainability, scaling and coordinating efficient sharing of material flows offers real advantages.

This orientation toward profit by growing the amount of waste moved to landfill or incinerator flies in the face of efforts to reduce waste. From a profit-seeking perspective, more is better. Perhaps this explains community development professionals disregard of efforts to reduce waste in small and rural communities. When local government is the waste manager, community development officials, at most, help their colleagues in local government locate contractors to move the materials to their next destination. They don't typically look at waste reduction as a community development activity, even though waste management is a necessary function in every community.

Without substantial subsidies, major waste hauling companies shy away from low density, low profit opportunities, especially in trying to deal with fluctuating commodity markets for recyclables. As the major cost of solid waste operations are in handling and hauling materials, shortening the distance and increasing densities are desirable.

Our research found that in most cases it was local community members that initiated any efforts to divert recoverable materials from the waste stream, either through building a network of concerned volunteers and/or finding supportive government officials to bring the community together to tackle the challenges of waste reduction. These waste reduction champions forged relationships not only with volunteers and supportive local officials but also with key businesses that wanted to reduce their own wastes, often saving themselves money.

In the dominant model of operation in most urban areas, either the entire system is privatized with citizens and businesses contracting with a private hauler, or the local government operates or contracts out the hauling for the community to private business. Small and rural communities usually look for a partnership between a nonprofit community organization with support from local government and the community at large. This is where the volunteer power can play a huge role, not only in keeping costs of operation lower but also building local community social capital. Frequently we see lower technology investments in smaller and rural community efforts. Meanwhile, larger communities are increasing their use of technology and material handling equipment to deal with the larger amounts and the sorting and decontamination that has increased, especially after the move toward single-stream collections.

While we didn't see any examples nearby of recycling cooperatives, we have read about marketing cooperatives among small and rural recycling programs in other states (Adams 2016) – including Maine, New Mexico, and Texas - that allow for some shared costs and increased densities of commodities for markets, which increases the saleable value of recovered materials. We certainly note a congenial community among the small and rural community program leaders that we talked to here in Michigan, but not yet a working cooperative that might strengthen these individual programs.

Thomas Bauwens recently (2021) made the case in an article in *Resources, Conservation and Recycling* that much of the circular economy is still driven by a model of growth, which is antithetical to waste reduction. Instead, he argues for a post-growth approach that:

...should embrace the principles of durability, efficiency, and frugality that are at the heart of the circular economy. However, they should also go beyond these by actively striving to maximize the wellbeing of both humans and non-human life through not only job creation but

also for community building and empowerment, and consideration for non-human life and its wellbeing. This can, for example, be done by adopting community or cooperative ownership characterized by democratic participation in decision-making and fair redistribution of economic surplus. Keeping business operations small-scale and localized to primarily serve local community needs, shortening working hours and cutting advertising are other ways to achieve wellbeing outcomes.

We believe, based on our research and experiences, that the focus on community waste reduction needs and a cooperative spirit of community wellbeing are necessary ingredients for an effective and sustainable community waste reduction operation in rural and small communities. Identifying the low hanging fruit to recover and move to regional markets is the place to begin. As conditions and opportunities allow, strategic advances can be undertaken to expand commodities retrieved. To launch a program, especially without existing material handling equipment at hand, but even with it, you will need labor. Building community support with partnerships with citizen groups, anchor institutions (churches, schools, government, hospitals, etc.) will broaden the base for recruiting volunteers. As success builds, creating paid positions that offer a living wage with further career opportunities will help develop knowledge and skills while establishing important continuity.

Even if one starts with an all-volunteer labor force, there is no reason not to look for entrepreneurial opportunities to spin-off or attract new companies to participate in the new system. Besides the recycle markets there are opportunities in each of these waste reduction efforts.

- Composting
- Reuse
- Repair
- Remanufacturing

We end up, in a sense, where we began. Recycling is a tailpipe solution to a solid waste problem. There is an often forgotten reason that the classic mantra of Reduce, Reuse, Recycle put "recycle" last. It's the tailpipe. More effort with more effective results would be on the front end of reduction. This begins with the design intention. William McDonough, the former dean of the school of Architecture at University of Virginia and co-author of *Cradle to Cradle*, often began his talks with the idea of "design intention." He offered that perhaps the ultimate design intention should be:

How do we love the children? And not just my children, but all the children? And not just children living today, but future generations. And not just human children, but children of all species.

That's a tall order, of course, but attempting to design with those concepts in mind would surely reduce the need for tailpipe solutions.

The framework of the circular economy helps us situate waste reduction efforts in a larger and more compelling context. Small and rural communities offer an appropriate laboratory to develop workable and sustainable approaches to the necessary waste reduction efforts our collective future demands. Enabling conditions that build social capital while shrinking our ecological footprint are perhaps more doable in smaller communities. Community development professionals might begin to look at how to put the circular economy to work in their communities. Focusing on waste reduction might be the first place to start.

If history is any indicator, rural and small communities wanting to develop programs to address reuse, repair, recycling or compost strategies should not wait for the economic development agencies to lead the effort, as they have little history of leading communities in this direction. It is a rare local government that steps in to lead the way. Local individual waste reduction champions, foundations and nonprofit organizations are the clear leaders in helping communities see the value of waste reduction as a means to community development and well-being. One rather rare exception of governmental vision has been Michigan's Emmet County, which serves as an excellent model of leadership. Ultimately, finding the best mix of interest and talent is dependent on the place of origin.

LAINGSBURG RECYCLING EVOLUTION – A CASE STUDY

The Laingsburg recycling program makes an interesting case study of a possible pathway for other small or rural community programs. Like many such local efforts, it was initiated by a small group of citizens who wanted to reduce waste and conserve natural resources. In 1988 they came together to explore ways to do this and in the spring of 1989 began a monthly collection of recyclables as the newly formed Greater Laingsburg Recyclers (GLR). That effort was demonstrably low-tech. In the driveway of the town's middle school they collected glass, which they broke in 5-gallon buckets with sledge hammers; tin and aluminum cans, flattened; empty milk jugs, stomped; and secured stacks of cardboard. They rented a truck to take much of the collected materials to various recovery sites around the region, including other regional recycling sites. The volunteers often worked from 7 a.m. until 7 p.m. to collect and transfer the materials.

The start-up costs of renting a truck for a day, insurance and other minor items were covered by two small grants from the county and the city, plus donations. This continued for a couple years before they contracted with a local area nonprofit recycler who brought a compartmental recycling trailer and provided rebates for certain materials. Donations were enough to cover the cost of the trailer rental. Shortly thereafter they added a separate trailer from a local insulation company that collected newspaper for shredding. That agreement offered some funds if collected amounts exceeded a minimum. During this time the GLR worked out agreements with the local school system to collect and bring materials from the three schools. GLR also accrued enough funds to buy education films for the schools and provide funding for an interested teacher to attend a conference on recycling education.

Laingsburg lies at the western edge of Shiawassee County, adjacent to Clinton County. Clinton County has had a more developed recycling program than Shiawassee, including a recycling education program for schools which they offered to Laingsburg schools. (The Laingsburg School district includes some adjacent portion of eastern Clinton County, and several of the key organizers have lived in Clinton County from the beginning).

Over the ensuing years the location of the drives shifted around the community as construction issues and available spaces came and went. Likewise, the vendors they contracted with also changed as first the local nonprofit recycling organization went out of business, followed by the area waste hauler who next provided services. In the latter case, the waste company was absorbed by a larger waste collection company. At each change in location or vendors, some adaptations took place that included what and how they collected materials. In January 2020 the GLR was about to call it quits due to a combination of aging volunteers (average age approximately 70 years old) and the loss of a site that could allow some

protection from the harsh winter and inclement weather. In a last gasp, they decided to host a community forum at the high school to see if there was sufficient community interest in keeping the effort going. The turnout was heartening as was some of the commitment to keep recycling alive.

But then COVID-19 hit. They held a drive in February, but then closed up to prevent spreading the virus. Simultaneously, they became aware of new grants being offered by the state of Michigan for recycling efforts. After some discussion it was decided to apply for a grant to build a small drive-through recycling center. That grant was submitted in late April 2020 and required a 20% match. The group approached the City of Laingsburg and the Laingsburg Community Schools, both of which enthusiastically supported this effort. Next, they sought support from both counties, local townships, a local community foundation and others to raise the matching funds.

Attempting this during the pandemic was an additional challenge. All local governments were struggling with how to address the growing threat while maintaining basic operations. Nonetheless, they managed to come up with enough matching funds to allow the GLR to submit a grant that might, if successful, get a basic building erected.

In the process the GLR, the City of Laingsburg and the Laingsburg Community Schools formed a Greater Laingsburg Waste Reduction Partnership (GLWRP), in which the school agreed to offer school property for the site, the city would take on fiduciary responsibilities, and the GLR would drive the project forward and oversee operations as they had for 30-plus years. Given the rise and fall of COVID infections and the aging volunteer base, they felt it wise to keep recycling suspended. In October 2020, GLWRP was notified that the state of Michigan was to award them some of the requested funds for the new facility after meeting some additional requirements.

Those requirements, which included raising more money to cover both the shortfall of the full grant request and the increased costs due to the changing economy of the pandemic, were met within a couple of months. A public fundraising campaign was then launched that gathered steam, especially with some sizable contributions from the Cook Family Foundation and generous benefactors who offered to match contributions to get us over the hump to complete the building. But the pandemic threw the entire construction industry into mayhem. Supply chains, increased prices, and shortages of labor delayed almost every project. New bids were sought and contracts signed, and work begun in late summer 2021 was completed in early December. The first recycling drive in the new facility took place in early December. An expanded volunteer base is being built to staff the facility more than once a month, beginning in January 2022. Additional items, including polypropylene (#5), glass, and electronics, will be added to items collected with more options being studied for future collection.

Compared with many other rural or small community recycling efforts that have lasted for decades, there are a few distinctive elements that combined to reach this stage of success.

1. A strong volunteer base, including a core group that goes all the way back to the start-up
2. Commitment to quality sorting of materials = little contamination
3. Establishing relationships with key anchor institutions
4. Living within means – limiting expenditures to those of revenues (primarily donations)
5. Ongoing use of local media to keep the public aware

The major expense over the years has been the pick-up and marketing of materials. With the new facility and the addition of a baler, not only will those costs be greatly reduced, but also the revenue stream for materials will expand. Aside from new costs for expanded insurance for liabilities and maintenance of equipment, building an all-volunteer staffing base will make this community-based effort sustainable. Expected increased revenues will be set aside to address inevitable fluctuations in market prices as well as allow some additional items to be collected which otherwise could not pay for themselves.

The increase in access should also generate significant increases in the collection of materials and make the center a visible hub of activity close to schools, businesses and government. The Laingsburg Community Schools want to not only engage their students in volunteering, but also to use the facility as a learning center for environmental education. The potential addition of solar power to the building and other future improvements become not such a far-fetched dream now that the center is up and running.

APPENDIX 1: LIST OF INTERVIEWEES

- Neil Seldman - Co-Founder Institute for Local Self-Reliance, Waste to Wealth Program director
- Kerrin O'Brien - Executive Director of Michigan Recycling Coalition
- Brian Ukena - Executive Director Recycle Ann Arbor,
- Matt Fletcher - Michigan EGLE, Recycling Markets Development Specialist
- Heidi Sanborn - Executive Director of National Stewardship Action Council,
- Jacob Hannah – Conservation Coordinator, Coalfield Development Corporation
- Brian Burke - Michigan EGLE, Recycling and Waste Minimization Specialist
- Thomas Hanna – Research Director, Next System Project
- Kristen Wieland – Communications Director, Kent County Department of Public Works
- Kate Melby – Communications and Education Director, Emmet County Recycling
- Dan Kietzer – Michigan Materials Marketplace
- Sarah Archer - President & CEO, Iris Waste Diversion Specialists
- Dr. Susan Selke – Professor Emeritus, MSU School of Packaging

APPENDIX 2: SITES VISTED

- Midland Recycling – Esther Williams, Executive Director
- Bay Area Recycling for Charities – Andy Gale, President and General Manager
- Emmet County Recycling - Kate Melby, Communications and Education Director
- Alpena Resource Recovery – Stan Mischley, Manager
- Recycle Livingston – Julie Cribley, Executive Director
- Sunfield Recycling Center -
- Emterra (Lansing) – Derrick Peterson, Plant Manager
- Friedland Industries (Lansing) – John Lancour, Vice-President
- Michigan State University Surplus and Recycling,- Dave Smith
- Charlotte Recycling Center.

APPENDIX 3: QUESTIONNAIRE

**Summary Responses by Interviewee to General Questions for Rural & Small
Community Waste Recycling and Reduction Project**

Question	Name/Organization	Responses
1. What are the two biggest challenges you see for rural and small community recycling programs, now and in the future?		
2. What are some of the opportunities you see for rural and small community recycling programs?		
3. Are you aware of any successful nonprofit, co-operative, worker-owned or community owned enterprises models and do you think any of those models would be appropriate for managing rural and small community recycling programs?		
4. What is your view of source separated vs single stream recycling as we move into the future, and especially as it relates to rural/small community?		
5. For a rural volunteer recycling effort trying to build a recycling center building, do you see any similarities with Kent’s transfer stations recycling efforts?		
6. What other waste reduction efforts might a rural or small		

community recycling project undertake?		
7. Are there any low hanging fruit for resource recovery that rural or small community recycling projects should pursue?		
8. Environmentally speaking what materials have highest value of environmental benefits, which have the least?		
9. Are there any significant reuse programs a rural or small community recycling project should pursue?		
10. What type of local businesses or institutions should a rural or small community recycling project connect with to enhance recycling and waste reduction?		

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