Networks Northwest Materials Management County Engagement

Including the counties of:
Antrim, Benzie, Charlevoix, Emmet,
Grand Traverse, Kalkaska, Leelanau,
Manistee, Missaukee, and Wexford

February 28, 2023

PREPARED BY:

RRS | recycle.com

COMMISSIONED BY:

Networks Northwest
Talent / Business / Community

EXECUTIVE SUMMARY

Networks Northwest serves the ten-county region through workforce development, business and economic development, and community development, aiming to build stronger communities and enhance the quality of life in Northern Michigan. The member counties in Networks Northwest region include Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, and Wexford.

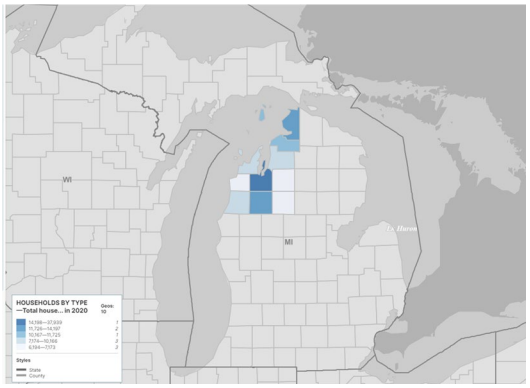


Figure 1, Networks Northwest, Region 10

Resource Recycling Systems (RRS) has been delivering results for clients since 1986. For municipalities, RRS assists in building strong recycling and organics programs by understanding waste streams, analyzing participation, developing best practices, and creating economically viable plans. The strength of RRS comes from the staff of strategists, engineers, economists, technical analysts, and communications specialists who are nimble and responsive, providing informed, innovative, actionable solutions to the sustainability challenges of our time.

Working together with Networks Northwest and member communities, RRS completed a comprehensive set of tasks that fulfills the objectives of Michigan Department of Environment, Great Lakes, and Energy (EGLE) Materials Management Community Engagement (MMCE) grant and lays the groundwork for regional collaboration in materials management planning among member communities.

The MMCE grant process is intended to help counties in the transition to materials management and begin to identify partnership within regions and counties, understand current materials management deficiencies and opportunities, highlight future changes to the planning process, and outline steps that can occur now at the county and regional levels to assist with the development of future materials management programs and infrastructure.

Key improvements and recommendations for counties within Networks Northwest are found in the respective sections in the report. RRS identified forty (40) recommendations that are categorized into seven areas which form the basis for a robust materials management system:

- Community Access
- Facilities and Infrastructure
- Robust Markets, including Materials of Focus
- Public/Private Partnerships
- Supportive Policy
- Education and Outreach
- Regional Planning

It is important to note that during the Networks Northwest MMCE grant, the Michigan Legislature passed long-awaited changes to update state policy intended to move toward a materials management model, leaving behind the landfill-focused planning efforts. The efforts of counties and regions to engage in pre-planning will enable them to develop the state-required 'Materials Management Plan' (formerly solid waste plan) and begin making progress toward their waste reduction goals.

TABLE OF CONTENTS

Methodology

PROCESS

Structurally, the MMCE grant project included three distinct but related components. Each component is explained in detail below.

Documentation of Programs and Infrastructure

EGLE developed a set of baseline information that serves as fundamental data to inform decision-making, both at the local and the state level. This baseline data was collected, organized and vetted to form a 'county profile' for each county in the Network Northwest region. This collection of information will assist counties and the region better understand the basic infrastructure, programs and services that are available in each county. Types of information gathered include the availability of County and municipally based programs and services (curbside and/or drop-off trash/recycling/organics/HHW), a listing of materials management facilities in each county and types of materials accepted, types of education and outreach, and waste-related policies enacted by municipalities.

Gap Analysis

Stakeholder Engagement was an important component of the identification of gaps in the regional and county systems. Feedback on current and future materials management programs, services and infrastructure was sought from two distinct stakeholder groups.

First, a qualitative survey was distributed by Networks Northwest to gather feedback from the general public. Full survey results that represent general responses of the entire region can be found in the section and in Appendix A. Concurrently, a simple open-ended set of questions was asked of municipal leaders. The questions were distributed via email to enable respondents to be as brief or detailed as they desired based on their level of interest and amount of time available to respond.

Recommendations for Improvement

Best management practices that support the implementation of programs and infrastructure to build a robust materials management system require a variety of components. No single practice will provide a sustainable and nimble system that can adjust as markets, human behavior, and product design change. As such, improvements to a materials management system must be multi-faceted to be sustainable. The recommendations that have been identified take into account the geographic location of the ten counties included in the study; the amount of manufacturing and general industry in the region that could influence (positively or negatively) the amount of waste generated and disposed in the region, and the type of policy that currently exists to support materials management strategies in individual counties.

KEY CONTACTS

Networks Northwest has an active Materials Management Advisory Committee (MMAC), comprised of a representative from each county with additional representatives invited to attend quarterly meetings. The MMAC served as the core work team, led by Networks Northwest, advising RRS of key issues, challenges, successes, and areas of overlap between counties. Table 1 shows the representatives that are members of the MMAC. Individual communications took place, as needed and as schedules allowed, between October 2022 and January 2023 to tease out individual county gaps and regional crossover needs and opportunities.

Three group engagement events were coordinated with the MMAC for the duration of the grant timeline. All engagements were available virtually to all members. Participation in each engagement is documented in Table 1.

- The first meeting, on September 9, 2022, served as a project kickoff to introduce RRS team members to the MMAC members. This meeting outlined the grant project purpose, stakeholder engagement efforts, county programs and infrastructure to be verified, and the forward-looking recommendations that will enable each county individually and the region collectively to prepare for materials management planning efforts.

- The second engagement on January 12, 2023, served as a work session to discuss the findings of the stakeholder engagement with the group and to discuss the gaps that were discovered during the stakeholder engagement process.

- The third and final engagement on February 24, 2023 was a summary of the findings and discussion of the recommendations to shrink the gap between current and desired programs, services, and infrastructure to meet the needs of the region and individual counties.

Table 1 Key county contacts for MMCE engagement

County	Name	Organization	Attended Kickoff on 9/9/22	Attended Work Session on 1/12/23	Attended Review Session on 2/24/23
Antrim	Jeremy Scott	Antrim County	x		x (via rep)
Antrim	Melissa Zelenak	Antrim Conservation District		x	x
Benzie	Jesse Zylstra	Benzie County		x	
Charlevoix	Terry Amick	Charlevoix County		x	x (via rep)
Emmet	Andi Tolzdorf	Emmet County DPW	x	x	x (via rep)
Grand Traverse	David Schaffer	Grand Traverse County	x	x	x
Kalkaska	Deborah Hill	Kalkaska County			
Leelanau	Trudy Galla	Leelanau County	x	x (via rep)	
Manistee	Karla Smith-Kasten	Bay Area Recycling for Charities		x	x
Missaukee	Liz Vogel	Missaukee County		x	x
Wexford	Joe Porterfield	Wexford County		x	
Networks Northwest	Mathew Cooke	Networks Northwest	x	x	x
Michigan EGLE	Tracy Purrenhage	State of Michigan, Department of Environment, Great Lakes, and Energy	x	x	x

PROGRAMS & INFRASTRUCTURE

KEY FACILITIES

Facilities that currently exist to support the collection and processing of recovered materials are listed in Table 2. These facilities are critical to the successful recovery and recycling and/or reuse of components of the waste stream. They should be considered for their potential expansion and interest in partnerships for the implementation of programs and services to support the entire region.

Table 2 Facilities that offer some level of collection or processing of recovered materials in the Networks Northwest region.

County	Qty	Facility Category	Accepted Materials	City	Facility Type
Antrim	3	Organics Facility	Brush and leaf drop offs	Elk Rapids, Bellaire, Mancelona	Compost Facility
Antrim	3	Transfer Station	Municipal Solid Waste	Ellsworth, Central Lake, Elk Rapids	Transfer Station Only
Antrim		Waste Diversion Center	Antrim Conservation District Household Hazardous Waste Collection Days	Varies	Temporary Drop-off
Antrim	7	Waste Diversion Center	Single Stream Recycling	Ellsworth, Bellaire, Central Lake, Elk Rapids, Ellsworth, Kewadin, Mancelona	Permanent Drop-off

County	Qty	Facility Category	Accepted Materials	City	Facility Type
Benzie	3	Organics Facility	Food scraps	Benzonia, Honor, Frankfort	Compost Facility
Benzie	2	Waste Diversion Center	Cardboard	Benzonia, Frankfort	Permanent Drop-off
Benzie	4	Waste Diversion Center	Single Stream Recycling	Frankfort, Thompsonville, Lake Ann, Beulah, Honor, Benzonia, Interlochen	Permanent Drop-off
Benzie		Waste Diversion Center	Tires and Household Hazardous Waste	Location Varies	Temporary Drop-off

County	Qty	Facility Category	Accepted Materials	City	Facility Type
Charlevoix	2	Organics Facility	Yard waste , stumps	Boyne City, Charlevoix	
Charlevoix	3	Transfer Stations	Boyne Valley Township Transfer Station	Boyne Falls (Boyne Valley Twp, Melrose Twp), Beaver Island	
Charlevoix	5	Waste Diversion Centers	Single Stream Recycling	Beaver Island, Boyne Falls, Boyne City, Charlevoix, Boyne Falls (Melrose Twp),	Permanent Drop-off
Charlevoix	2	Landfills	Internally generated material - does not accept external material	Charlevoix, East Jordan	Type III Low Hazardous Waste/Industrial Waste Landfill
Charlevoix	1	End Markets	East Jordan Plastics	East Jordan	

County	Qty	Facility Category	Accepted Materials	City	Facility Type
Emmet	1	MRF	Dual Stream Recyclables	Harbor Springs	Public MRF
Emmet	2	Compost/AD Facility	Food scraps, yard waste, stumps	Harbor Springs, Mackinaw City	Windrow
Emmet	1	Transfer Station	Municipal Solid Waste	Harbor Springs	Transfer Station Only
Emmet	14	Waste Diversion Center	Dual Stream Recyclables	Harbor Springs (Harbor Springs, Springvale Twp, Pleasantview Rd, State Road), Petoskey (Petoskey, Toski-Sands, South, D&W Plaza, Bear Creek Crossings), Cross Village, Alanson, Mackinaw City, State Road, Pellston (Pellston, Robinson Rd)	Permanent Drop-off
Emmet	2	Secondary Processor or Broker	Petoskey Plastics, Harbor Springs Excavating	Petoskey, Harbor Springs	
Emmet	2	End Market	Petoskey Plastics, Harbor Springs Excavating	Petoskey, Harbor Springs	

County	Qty	Facility Category	Accepted Materials	City	Facility Type
Grand Traverse	1	MRF	Single Stream Recyclables	Traverse City	Private MRF
Grand Traverse	2	Compost/AD Facilities	Food Waste, Yard Waste	Traverse City	Vermicomposting, Windrow
Grand Traverse	1	Transfer Station	Municipal Solid Waste	Traverse City	Transfer Station Only
Grand Traverse	6	Waste Diversion Center	Single Stream Recycling	Acme Twp, Fife Lake Twp, Garfield Twp, Paradise Twp/Kingsley, Peninsula Twp, Whitewater Twp	Permanent Drop-off

County	Qty	Facility Category	Materials Accepted	City	Facility Type
Kalkaska	1	Transfer Station	Municipal Solid Waste, Construction & Demolition Waste	Kalkaska	Transfer Station Only
Kalkaska	3	Waste Diversion Center	Single Stream Recyclables	Kalkaska (Kaliseum, Bear Lake Twp, CETA Hall)	Permanent Drop-off

County	Qty	Facility Category	Materials Accepted	City	Facility Type
Leelanau	1	Landfill	Municipal Solid Waste, Construction & Demolition Waste	Maple City	Landfill
Leelanau	7	Waste Diversion Center	Single Stream Recyclables	various	Permanent Drop-off
Leelanau	2	Organics Facilities	Residential, Commercial, Agricultural	Maple City	Organics

County	Qty	Facility Category	Materials Accepted	City	Facility Type
Manistee	2	Organics Facility	Yard Waste	Manistee, Filer Twp	
Manistee	5	Transfer Station	Municipal Solid Waste	Manistee, Dickson Twp, Maple Grove Twp/Village of	Transfer Station Only

				Kaleva, Pleasanton Twp, Bear Lake	
Manistee	1	Waste Diversion Center	Household Hazardous Waste, Electronics		Temporary Drop-off
Manistee	1	Waste Diversion Center	Tires		Temporary Drop-off
Manistee	1	Waste Diversion Center	Plastic bottles/jugs; metal cans/foil	Manistee	Permanent Drop-off
Manistee	9	Waste Diversion Center	Single Stream Recycling	Arcadia, Bear Lake, Brown Twp, Clean Twp/Copemish, Dickson Twp/Brethren, Maple Grove Twp/Kaleva, Marilla Twp, Onekama Twp/Village, Sprindale Twp	Permanent Drop-off
Manistee	2	Waste Diversion Center	Paper only	Manistee, Thompsonville	Permanent Drop-off
Manistee	1	Waste Diversion Center	Collection and processing of electronics, mattresses, industrial recycling	Kaleva	Permanent Drop-off
Manistee	1	Secondary Processor	Fiber	Manistee	Containerboard Mill
Manistee	1	Landfill	Municipal Solid Waste	Manistee	Type II landfill
Manistee	1	End Market	Fiber	Manistee	Containerboard Mill

County	Qty	Facility Category	Materials Accepted	City	Facility Type
Missaukee	1	MRF	Glass bottles; plastics 1-5 & 7; cardboard; paper; shredded paper; any metals; aluminum foil; ink cartridges; Christmas lights; soft/hardcover books; vinyl siding; electrical cords	Lake City	Public Baling
Missaukee	1	Waste Diversion Center	Glass bottles; plastics 1-5 & 7; cardboard; paper; shredded paper; any metals; aluminum foil; ink cartridges; Christmas lights; soft/hardcover books; vinyl siding; electrical cords	Lake City	Permanent Drop-off

County	Qty	Facility Category	Materials Accepted	City	Facility Type
Wexford	1	MRF	Cardboard, boxboard, paper, plastics (#1,2,5); metals	Cadillac	Private Baling
Wexford	1	Waste Diversion Center	Cardboard, boxboard, paper, plastics (#1,2,5); metals; electronics; Christmas lights; appliances.	Cadillac	Permanent Drop-off
Wexford	1	Landfill	Municipal solid waste	Cadillac	Type II landfill

CURBSIDE SERVICES PROGRAM MATRIX

	90% or more of single-family households have access to service curbside services through contracted, municipal, or subscription haulers
	Some (<90%) single-family households have access to curbside services through contracted, municipal, or subscription haulers
	No communities provide or have access to curbside services through contracted, municipal, or subscription haulers.

County	Solid Waste	Recycling	Yard Waste
Antrim			
Benzie			
Charlevoix			
Emmet			
Grand Traverse*			
Kalkaska			
Leelanau			
Manistee			
Missaukee			
Wexford			

*Recycling and yard waste service provision required under Grand Traverse County ordinance upon request.

DROP-OFF SERVICES PROGRAM MATRIX

	County hosts at least one drop-off per 10,000 residents
	Some drop-off locations in the county, but less than one per 10,000 residents OR county hosts collection events with no permanent drop-off location OR community-specific drop-off not accessible to all county residents
	No drop-off locations in the county

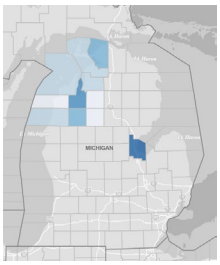
County	Solid Waste	Recycling	Yard Waste	HHW
Antrim				
Benzie				
Charlevoix				
Emmet				
Grand Traverse				
Kalkaska				
Leelanau				
Manistee				
Missaukee				
Wexford				

BENCHMARK COMMUNITIES

Bay County, MI

Population : 63,637

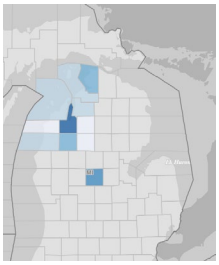
- Drop-off recycling & HHW services are available to county residents through Bay County Environmental Affairs & Community Development (EACD).
- Many communities contract for curbside trash, recycling, and yard waste.



Isabella County, MI

Population : 70,226

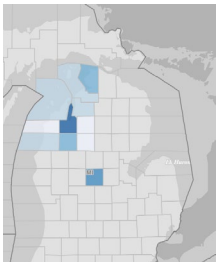
- Residents can access county-run permanent drop-off programs for recycling and yard waste (1 main site and 3 depots) and temporary HHW events.
- Some municipalities offer clean up days for excess trash.
- Curbside recycling is available to residents of five communities.
- Some municipal yard waste collection also occurs in the county.



Mt. Pleasant, MI

Population : 26,016

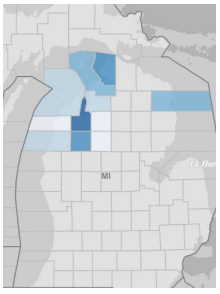
- Located in Isabella County
- The city maintains contracted service for curbside trash, recycling, and yard waste with a pay-as-you-throw (PAYT) system.
- Residents of the city can utilize public drop-off services through Isabella County or drop-off through private entities.



Alpena County, MI

Population : 29,598

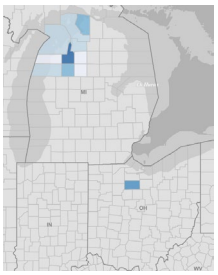
- County MRF site accepts recycling, construction waste, and waste from residents and businesses.
- Some materials accepted at the MRF site include batteries, electronics, latex paint, large appliances, tires, and scrap metal.
- There are also 10 county-wide recycling drop-off sites and one out-county site.
- Solid Waste Authority established January 2023 to develop regional MRF at county airport property.
- PA 138 plus commodity sales fund county recycling collection and processing.
- Several communities provide yard waste pickup or drop-off access.



Tiffin, OH

Population : 17,841

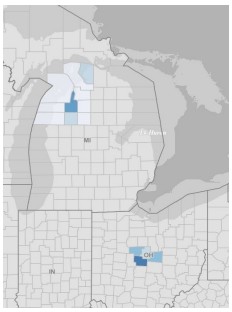
- Located in Northern Ohio between Bowling Green and Columbus.
- The city mandates bi-weekly curbside recycling collection.
- Tiffin is part of a franchise agreement for single hauler recycling drop-off or special collection offered through Ottawa/Sandusky/Seneca Solid Waste District (OSS).



Delaware-Knox-Marion-Morrow Joint Solid Waste Management District, OH

Population : 328,674

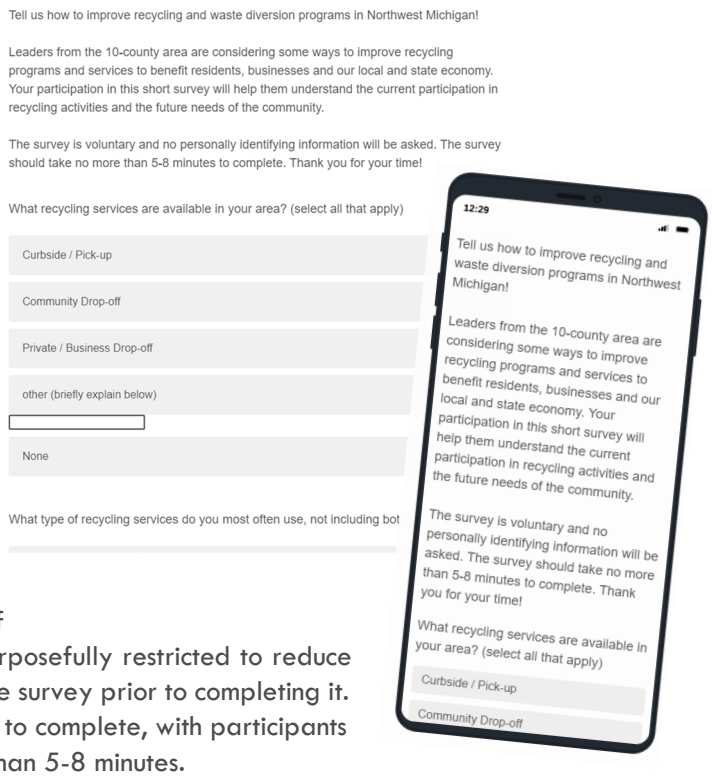
- Located in Central Ohio
- The district provides 24/7 recycling drop-off locations, and curbside collection is offered in many communities.
- Residents can access HHW drop-off services twice monthly.
- The district provides online and in-person outreach and education efforts to all member counties and a competitive grant program for improved recycling in the district.



STAKEHOLDER FEEDBACK

While the geographic footprint of Networks Northwest is large (4,722 square miles), the general insights gained from stakeholder engagement were generally consistent across the region.

Stakeholder feedback was sought in two distinct ways. First, a qualitative survey was distributed by Networks Northwest to gather feedback from the general public. Concurrently, a simple open-ended set of questions was asked of municipal leaders. The questions were distributed via email to enable respondents to be as brief or detailed as they desired based on their level of interest and amount of time available to respond.



Community Survey

Over 1,650 individuals took the survey that included questions about current participation in recycling-related activities as well as future needs and demographic information to inform trends.

This survey was not intended to meet statistical minimums for accuracy. Rather, it was intended to be a snapshot to inform the current usage and future needs of the region. The set of questions that were asked was purposefully restricted to reduce the chance of survey fatigue, wherein participants close the survey prior to completing it. The survey was intended to take no more than 10 minutes to complete, with participants being told in the introduction that it should take no more than 5-8 minutes.

The survey was distributed by community recycling coordinators and Networks Northwest via social media and press release. Survey logic was built into the flow of questions to ensure that the appropriate type of question was asked based on previous responses. As such, participation rates in each question varied. The majority of survey respondents are current recyclers and is the result of the way the survey was distributed. Further studies to understand reasons for non-participation may be needed.

The full survey, including questions and responses, of the entire region can be found in Appendix A and county-specific survey results can be found in supplemental reports for each county.

DEMOGRAPHICS

- Respondents are primarily females, 50 years of age or older.
- Unsurprisingly, because of the age range of our respondents, 82% do not have children living at home who are school age or younger.
- 91% have some college education or higher.

- 93% of respondents own the home that they live in and most are year-round residents.
- Most survey participants lived in Charlevoix, Grand Traverse, or Emmet County.
- 94% of respondents are white with little representation of other racial or ethnic groups.
- Median yearly household income from participants falls between $75,000 - $100,000 per year.

CURRENT PARTICIPATION

METHODS OF PARTICIPATION

Community drop-off is the predominant recycling service type offered and used across the studied counties. Only a quarter of the participants reported having curbside or some type of 'pick-up services' and a handful use 'other recycling services,' like business drop-off, hazardous waste drop-off, seasonal community drop-off for specific items, and can & bottle returns.

Most participants who use drop-off stations report participating every week (47%) or every two weeks (33%). Of those who have curbside recycling, the majority report participating every week (74%) or every two weeks (21%).

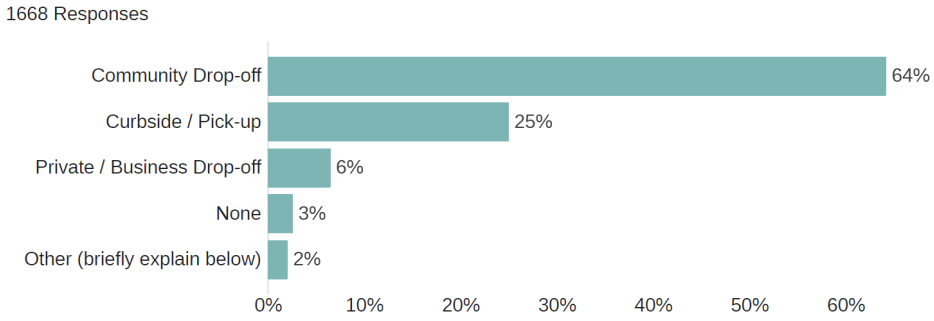
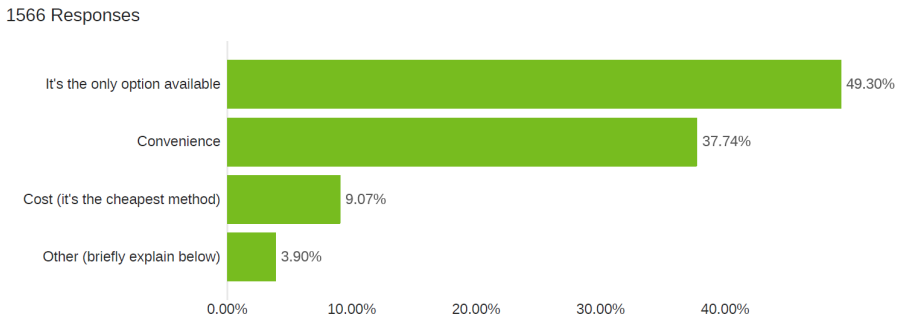


Figure 2 Representative key words that 42 survey respondents provided as optional 'other' responses.

MOTIVATION

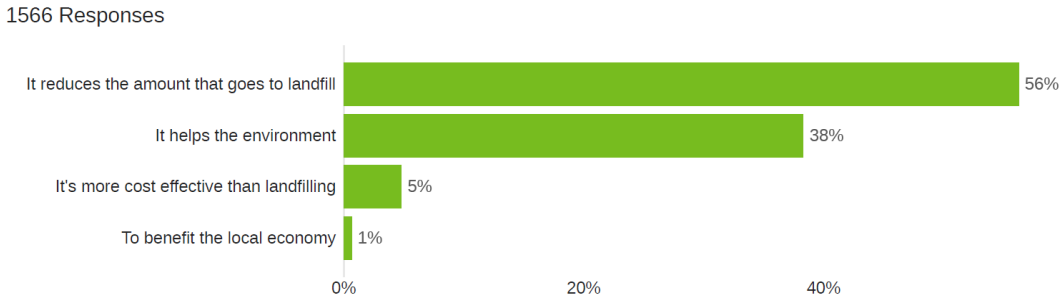
When asked for the most important reason the respondents chose to recycle this way, most people indicated this is the only option available to them. Convenience was the second most popular response, with cost (i.e. it's the cheapest method) reported just by over 9% of respondents. Note that this question could have only one response selected.



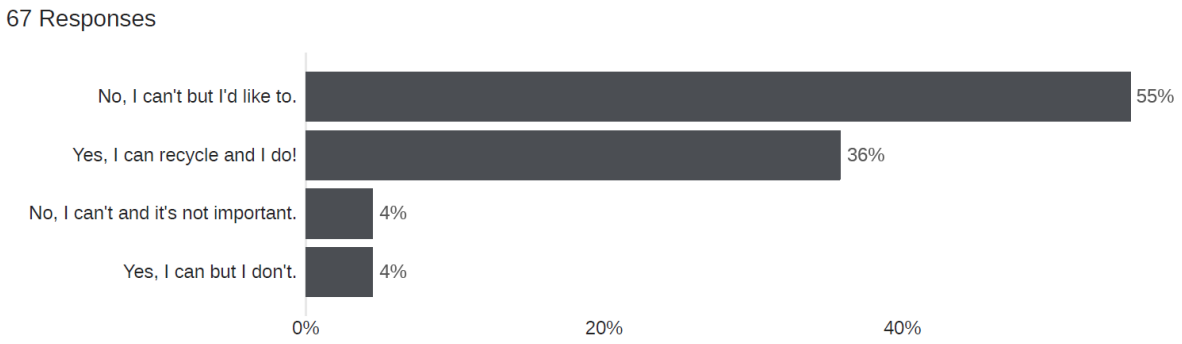
When asked about motivations for recycling, very few respondents are compelled to do so for economic reasons (i.e. to save themselves money). This is consistent with the provision of trash and recycling services in the region in that most people are not charged based on the amount of trash set out for disposal (per bag or per pound) but rather a flat rate based on a 96-gallon cart. As such, people are not financially rewarded or incentivized for recycling.

Survey results indicate that most people associate recycling as a way for them to actively reduce the amount of waste headed to landfills or, similarly, to contribute beneficially to the environment.

Most survey respondents do recycle, which is unsurprising based on the expected response bias based on survey distribution.



Respondents were asked if they own their own home or are buying a home or if they lease or rent. Sixty-seven (67) people responded that they lease or rent and were asked about their access to on-site recycling services. Over half of the respondents to this question do not have access to on-site recycling but would like to. Another 36% do have access to recycling and participate.

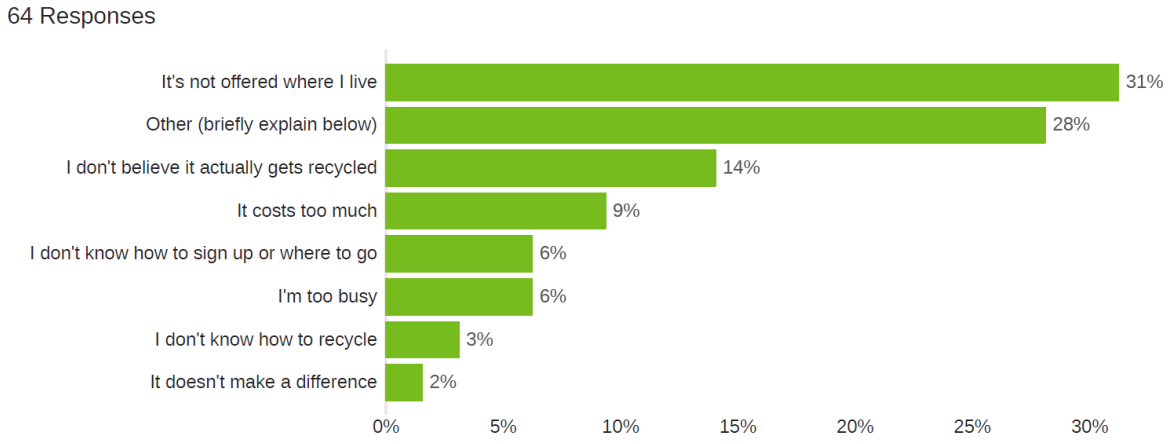


NON-RECYCLERS

While most survey respondents do recycle, there was a small group (64 people) that participated in the survey and do not recycle.

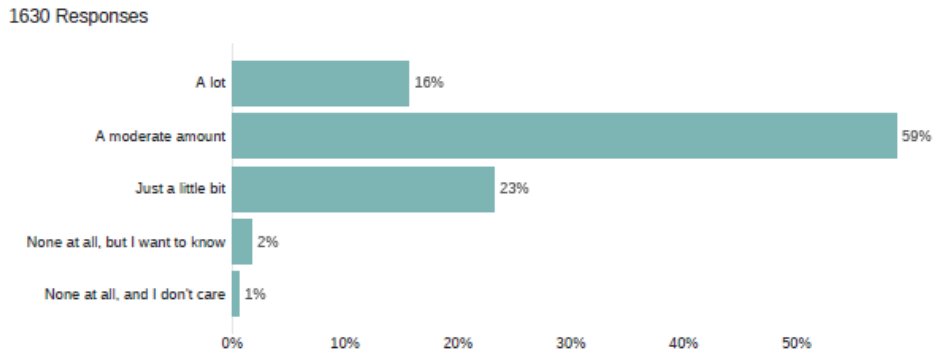
When asked for the most significant reason they do not recycle, 20 of the 64 non-recyclers indicated it is not available where they live. Again, perceptions of the term 'available' could suggest that if curbside recycling is not available then no recycling is available, but this was not included in the scope of the survey. There were a number of 'other' responses that suggest that recycling may be available, but it is not convenient, in their opinion, or they stopped participating because of frustration that the collection bins were often full.

Important for future outreach and education initiatives, 16% of respondents indicate they do not recycle either because they don't believe it actually gets recycled or because they don't believe it makes a difference. Emmet County has done a good job of promoting the state-wide markets for materials from their Materials Recovery Facility. This type of message can counter the negative messages that people have heard from national media outlets that do not necessarily apply to markets available to MRFs in Networks Northwest region.

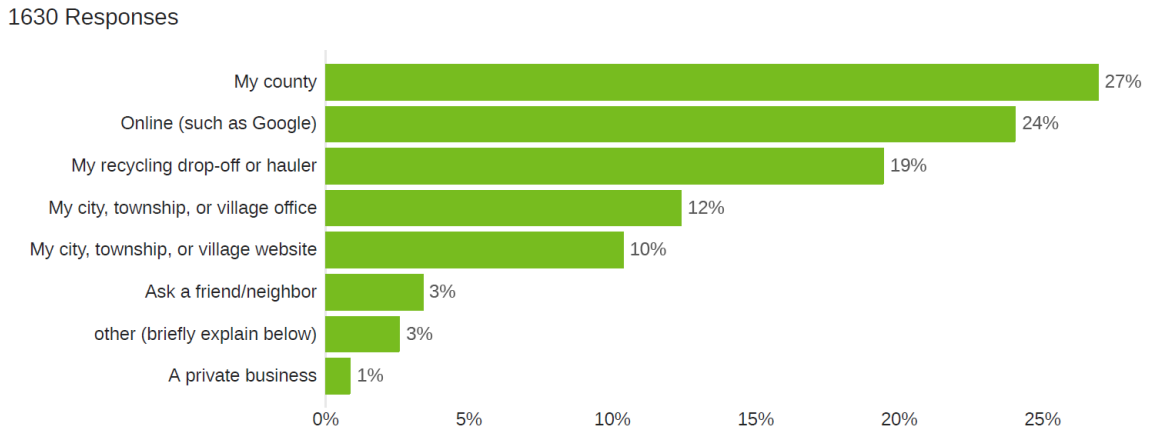


COMMUNICATION

Survey respondents feel moderately educated about recycling, generally speaking. However, it is worth noting that there were dozens of comments expressing a strong desire for additional details about recycling guidelines for specific items or for a regular update of acceptable recyclables. It is clear that recyclers are hungry for more education to help them feel more confident in their recycling efforts.

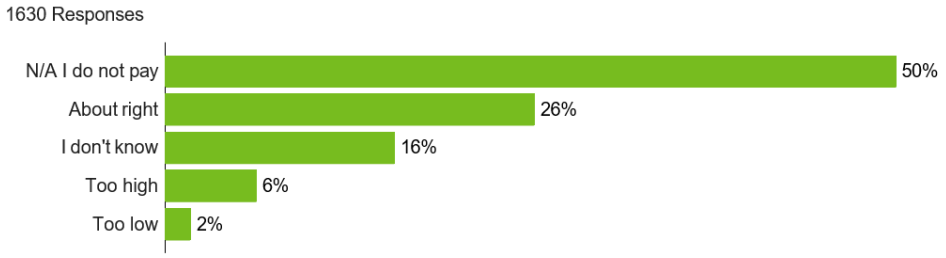


All survey participants were asked where they would seek out answers to recycling questions, whether they currently participate or not. 68% of respondents first look to their municipality and/or recycling provider (the operator of the drop-off station or curbside recycling service) for questions about recycling, with the remainder relying on a mixture of their preferred search engine (Google, etc.) asking a friend/neighbor, or asking a private business for advice.



COSTS

When asked about the cost to recycle, half the respondents (815) indicated this question was not applicable to them because they 'do not pay' for recycling access. While it can be argued that the survey respondent was not asked whether he/she knows that the cost of recycling is 'bundled' into the cost of trash collection (which is the case in some but not all parts of the region), perception of cost is a critical influence over participation in recycling.



In the case of curbside recycling, when recycling service is paired with the "opposite" service (trash) without having to decide to pay more for it, the cost to recycle is balanced. Alternatively, when recycling services are offered as an optional 'add on', the cost to recycle becomes a detriment to someone's desire to participate.

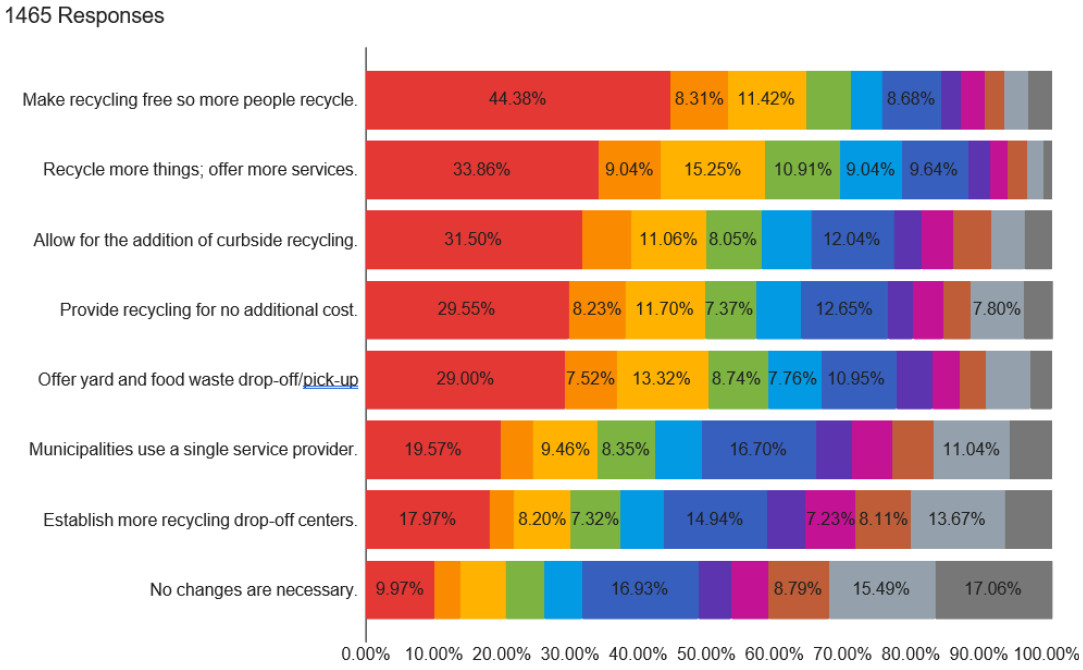
Grand Traverse County's ordinance requires recycling service to be paired with trash service in most of the county. In this case, a resident does not see a cost for recycling specified on the bill from the waste hauler but there is no question that this service is built into the price of the services.

In the case of drop-off recycling, some counties rely on policy, such as PA 69, to provide a funding mechanism that physically separates the cost of recycling services from the cost of trash services. Residents may see the household recycling cost one time each year (generally on a seasonal tax bill) and never think about it the remainder of the year. In addition, PA 69 generally requires a resident to opt-out, which increases the likelihood that they will not only participate but that they will continue to pay into the system.

FUTURE IMPROVEMENTS

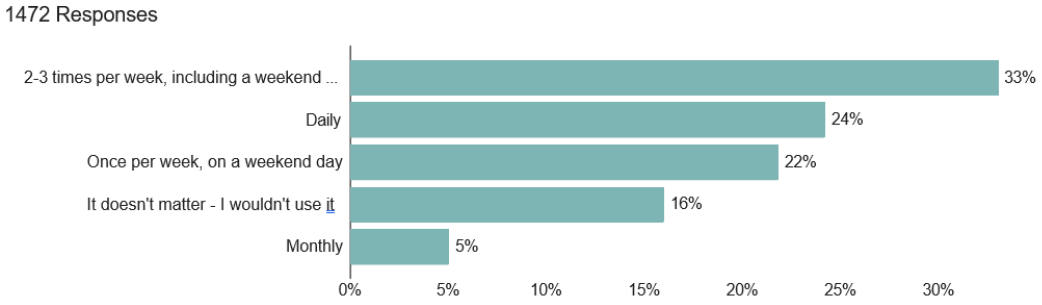
PRIORITIES

When asked to prioritize a list of improvements to recycling and waste management-related services for residents and businesses, "make recycling free so more people recycle" was ranked highest, followed by the desire to recycle more things along with offering more services. The third priority is allowing for the addition of curbside recycling where services do not currently exist.



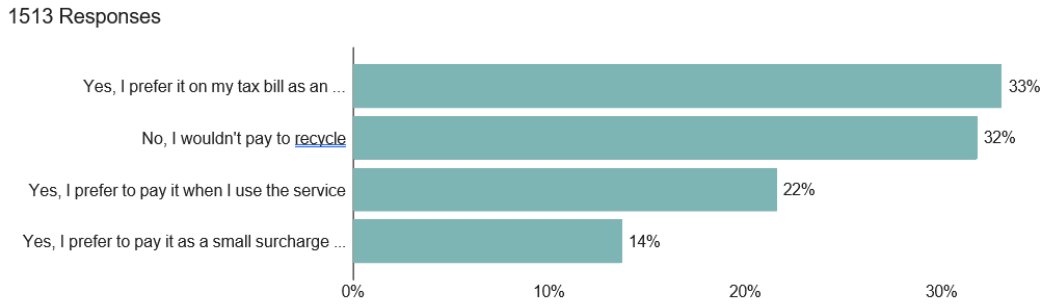
AVAILABILITY

When asked how often the respondents want a convenient recycling or food waste drop-off site open, 33% of respondents would like it to be open 2-3 days per week, including a weekend day. Nearly one quarter of respondents (24%) want it open daily and another 22% prefer it to be open just one day per week.

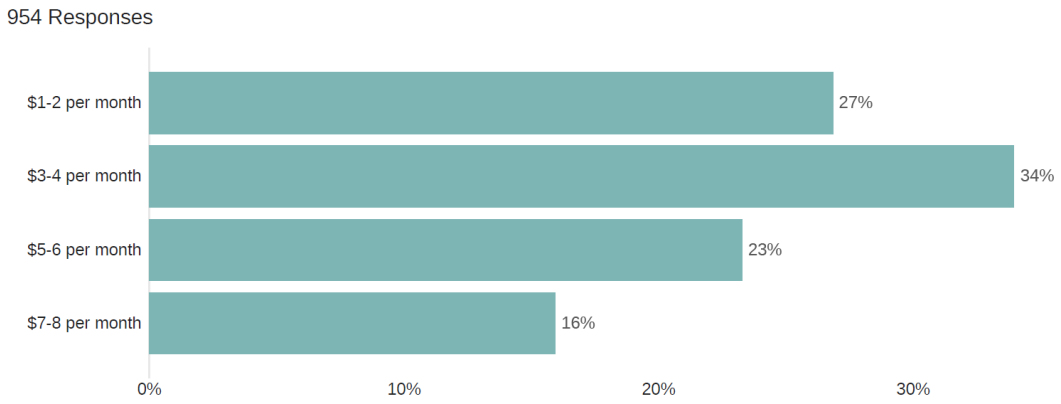


FUTURE COSTS

When asked about willingness to pay a small fee to have convenient access to recycling or food waste collection, the majority of respondents are willing to pay, with most people (33% of respondents) preferring to have the fee applied on their taxes. Conversely, 32% of respondents would not pay to recycle.



When asked for a price threshold, survey respondents were given options ranging from $1-2, $3-4, $5-6, $7-8 or the option of 'I'm not willing to pay anything.' More than one third of respondents would not be willing to pay anything for convenient access. Of those willing to pay, most felt $3 to 4 dollars was a comfortable price point.



County & Municipal Feedback

Respondents to the county and municipal feedback email did not represent all counties but provided specific highlights and suggestions that they would like to see or that they have had requested from constituents.

Table 3 County and municipal feedback on recycling programs

County	# of Responses	Highlights	Suggestions
Antrim	**8**	• Recycling sites are generally well maintained. • County coordinates HHW days many residents utilize. • Communities provide clean up days for excess residential waste	• Trash disposal site & additional recycling sites • Recycling site monitoring • Public education campaign • Curbside compost and recycling programs
Benzie	**7**	• 24/7 drop-off recycling sites & 2-3 HHW collections per year • Cost-effective staffing • PA 69 funding support across county	• Single or preferred curbside hauler agreements. • Additional recycling sites, bin collection frequency, and site monitoring • Permanent site or more collection events for HHW, bulky items, & organic waste
Charlevoix	**8**	• Recycling sites are used frequently by residents and are generally well maintained. • HHW events are well utilized	• More recycling sites needed (seasonally?) • Public education campaign • Expand curbside service availability, include multi-family. • Coordinate business, school recycling. • More outlets/events for batteries, tires, e-waste, and organics
Emmet	**5**	• Curbside and drop-off recycling programs are well-structured and well-utilized. • Financial incentives to recycle. • Committed staff and largely supportive political backing	• Drop-off site in Petoskey • Textile recycling options • Public education campaign
Leelanau	**2**	• Drop-off sites are well utilized. • Residential support for household fee to fund programs • HHW and hard-to-recycle material collection events available annually for residents	• More recycling sites in less accessible or populated areas • Expand multi-family services and school recycling programs (use them as drop-sites?) • Develop multi-county composting program

GAPS

The gaps that exist in Networks Northwest's region are not dissimilar to those that exist in other parts of Michigan, particularly those that are rural and in the deepest portion of a peninsular state. Increasing the recovery of materials in the disposal stream will require concurrent increases in access to services for a variety of stakeholders, including residents, commercial establishments, and institutional entities (schools, colleges, hospitals, etc.). These include:

- Development of new and expanded facilities and infrastructure.
- Robust markets and efficient logistics to ensure access to markets.
- Development of relationships among a variety of partners, including public/private partnerships.
- The acknowledgement that policy may be necessary to support some goals, and
- A collaborative effort to communicate information clearly and consistently about recycling among communities served by the same processing facilities.

Table 4 Basic Framework for Establishing a Robust Materials Management System

System Component	Basis
Community Access	Every household, business and institution in a community needs convenient access to effective programs. This access can be through curbside collection, drop-off site locations, or a combination of the two. Material diversion and recovery needs to be as convenient as waste disposal as a first step to sustainable materials management.
Facilities & Infrastructure	The material collected at the home, business or institution needs to be processed before reaching the end market. It is crucial for the County to have processing facilities conveniently located, technologically advanced, and with enough capacity to handle the population's current and future material streams. These facilities act as the "middleman" between local government, generators and end markets.
Robust Markets	The success of end markets that receive the recyclables that are collected leads to success in growing a sustainable circular economy that ultimately allows material to be diverted from landfills over the long term. By increasing demand, NN creates a 'pull' for additional materials that in turn, drives supply.
Public/Private Partnerships	The business community and NN will need to work closely together to find success. These partnerships can be found through funding opportunities with private companies, shared owner/operator agreements for MRFs and composting facilities, marketing and educational campaigns, and everything in between. Many retailers and packaging companies are realizing that local governments are responsible for the end of life for their products, thus strengthening the sustainability profile of their product. Therefore, the benefits of public/private partnerships are becoming more apparent and accessible.
Supportive Policy	To reach high landfill diversion goals, policy will need to be crafted to ensure that responsible recovery of material is the standard practice throughout the community, not just the best practice. A variety of policy approaches can be explored for NN that have found success in other parts of the country and perhaps the globe.

System Component	Basis
Education and Outreach	Once a strong infrastructure is in place, all citizens and businesses will need to know how to handle material in their home and at work. Recycling systems continue to evolve as material composition changes and technologies change. Thus, information needs to be put in front of the citizens of your community on a regular basis in many different ways to feed MRFs and end markets with good quality material, while continuing to decrease the material buried in landfills.

A 2019 study [1] by RRS, commissioned by Michigan Department of Environment, Great Lakes, and Energy, determined Region 10 (Networks Northwest) would need to recover over 81,000 tons of traditional recyclables, electronics, wood, yard and food waste, and textiles to contribute to the State's goal to triple the recycling rate. Table 3 shows the regional breakdown of targeted material recovery across all 14 regions within Michigan Association of Regions to achieve a 45% recycling rate.

Table 5 Target Recovery by COG Region to Triple Recycling Rate (Tons)

COG REGION	PAPER	PLASTIC	METAL	GLASS	ELECTRONICS	WOOD	YARD WASTE	FOOD	TEXTILES, (BATTERIES, TIRES, CARPET, LIGHT BULBS)	TOTAL
REGION 1	467,233	165,925	110,101	27,323	7,310	175,069	55,997	250,168	11,230	1,270,356
REGION 2	29,719	10,552	7,000	1,737	462	11,137	3,562	15,915	712	80,796
REGION 3	56,170	19,943	13,235	3,284	874	21,049	6,732	30,079	1,348	152,714
REGION 4	27,602	9,800	6,500	1,613	429	10,343	3,307	14,780	662	75,036
REGION 5	52,618	18,681	12,397	3,077	822	19,717	6,306	28,175	1,264	143,057
REGION 6	47,297	16,793	11,143	2,765	738	17,723	5,669	25,326	1,136	128,590
REGION 7	85,681	30,414	20,178	5,007	1,327	32,109	10,265	45,887	2,054	232,922
REGION 8	123,345	43,796	29,061	7,212	1,925	46,218	14,782	66,046	2,961	335,346
REGION 9	13,035	4,620	3,064	759	197	4,888	1,560	6,984	309	35,416
REGION 10	30,009	10,645	7,060	1,751	461	11,247	3,593	16,075	716	81,557
REGION 11	5,351	1,898	1,257	312	81	2,006	640	2,867	127	14,539
REGION 12	21,669	7,689	5,101	1,264	333	8,121	2,596	11,607	518	58,898
REGION 13	7,704	2,731	1,811	448	115	2,891	922	4,132	182	20,936
REGION 14	28,462	10,103	6,704	1,663	441	10,668	3,411	15,244	682	77,378
Total	**995,895**	**353,590**	**234,612**	**58,215**	**15,515**	**373,186**	**119,342**	**533,285**	**23,901**	**2,707,541**

[1] Michigan Recycling Economic Impact & Recycled Commodities Market Assessment, 2019, EGLE, https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Recycling/Michigan-Market-Development-Report.pdf

Regional Gaps

COMMUNITY ACCESS

Every household and business in a community needs convenient access to effective programs. This access can be through curbside collection, drop-off site locations, or a combination of the two. Material diversion and recovery needs to be as convenient as waste disposal as a first step sustainable materials management.

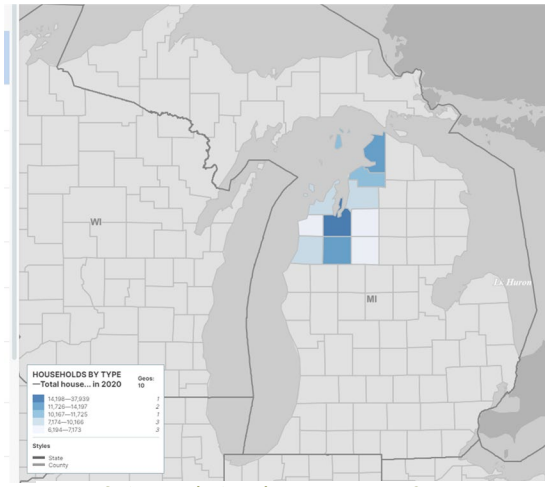


Figure 3, Networks Northwest, Region 10

Though several counties in Networks Northwest employ a either policy and/or funding mechanisms and rely on varying scales of infrastructure (either publicly or privately owned), region-wide access to convenient recycling services is lacking.

- All but one county offer at least one recycling drop-off site for recyclables, though a single drop-off does not meet the requirements of the 'Benchmark Recycling Standard' required in the updated materials management planning law.
- Some counties have curbside recycling access available in select areas, supported by policy, by municipal contract, or through a subscription service offered by a recycling hauler.
- Two counties (Emmet and Benzie) have a drop-off program for food waste. The former is operated by the county and the latter sees the county as a partner.
- No county in Networks Northwest offers curbside collection of food waste.
- One county (Emmet) is offering recycling services to residents in multifamily dwellings (apartments, condos, greater than 4-plex). Though waste haulers may offer this service, it is not widely utilized and requires additional engagement of property management to ensure access.
- All counties have at least one comprehensive household hazardous waste collection event per year. However, all require appointments, which deter participation, and have limited options to ensure convenient access outside these one-day events.

Population:	310,802
Square Miles of Land Area:	4,722.3
Households:	128,592
Employer Establishments:	9,550
Countywide Curbside Trash:	NO
Countywide Curbside Recycling:	NO
Countywide Curbside Organics:	NO
Countywide Drop-off Trash:	NO
Countywide Drop-off Recycling:	NO
Countywide Drop-off Organics:	NO
Countywide Drop-off HHW:	YES

Processing Facilities: The material collected at the home and business needs to be processed before reaching the end market. It is crucial for the County to own or have access to processing facilities conveniently located, technologically advanced, and with enough capacity to handle the population's current and future material streams. These facilities act as the "middleman" between the local government and the end market.

- There are two major Materials Recovery Facilities in the region that are preparing single- or dual-stream recyclables for market.
- There are several additional minor-scale processing facilities that are aggregating recyclables for market entry, but they are limited in their ability to process larger amounts of

materials based on the basic infrastructure being used. More robust equipment and facilities would be needed to increase capacity.

Robust Markets: The success of end markets that receive the recyclables that are collected leads to success in growing a sustainable circular economy that ultimately allows material to be diverted from landfills over the long term. By increasing demand, Networks Northwest creates a 'pull' for additional materials that in turn, drives supply.

- There are very few market outlets located within the Networks Northwest region. However, Emmet County has done significant work to identify markets within the state and region for most, if not all, materials accepted at their MRF. Though most materials will leave the Networks Northwest region, there is good Midwest market access for larger volumes of materials that are collected through a hub-and-spoke model(s).

Public/Private Partnerships: The business community and Networks Northwest will need to work closely together to find success. These partnerships can be found through funding opportunities with private companies, shared owner/operator agreements for MRFs and composting facilities, marketing and educational campaigns, and everything in between. Many retailers and packaging companies are realizing that local governments are responsible for the end of life for their products, thus leading to the sustainability of their product. Therefore, the benefits of public/private partnerships are becoming more apparent and accessible.

- Though there are several existing relationships that are driving increased recovery of specific materials (paper cups, cartons) and several examples of regional participation in NextCycle Michigan, there is significant opportunity for the growth of public/private partnerships to improve material recovery and build a regional circular economy.
- Several counties partner with local businesses to host recycling drop-off stations.

Supportive Policy: To reach high landfill diversion goals, policy will need to be crafted to ensure responsible recovery of material is the standard practice throughout the community, not just the best practice. A variety of policy approaches can be explored for Networks Northwest that have found success in other parts of the country and the globe.

- Several types of policy are implemented across the region to support existing materials management efforts, including county-wide ordinance, flow control, Public Act 69, and millage.
- However, several counties do not have any policy that supports their materials management efforts. Though policy is not a requirement for success, it can ensure equitable access and the assurance of funding to sustain programs.

Education and Outreach: Once a strong infrastructure is in place, all citizens and businesses will need to know how to handle material in their home and at work. Recycling systems continue to evolve as material composition changes and technologies change. Thus, information needs to be put in front of the citizens of your community on a regular basis in many different ways to feed MRFs and end markets with good quality material, while continuing to decrease the material buried in landfills.

- Grand Traverse and Emmet Counties have both built brands (RecycleSmart and EmmetRecycling) that help direct their respective communities to resources that will help them get the right material to the right place.
- Though GFL is one of the largest MRF operators in the region and all recyclables from Networks Northwest that go to GFL's facility can, theoretically, accept the same recyclable materials, there is no consistency in the web or print educational materials across the GFL service territory. For example, on Leelanau County's website, Styrofoam is specifically listed as recyclable at the drop-off recycling locations and in Benzie County polystyrene

packaging that has a #6 on it is accepted, without mention of Styrofoam. However, GFL's website clearly states that Styrofoam is not accepted.

Plastic bags, shredded paper, pizza boxes, propane tanks, empty paint cans, empty motor oil bottles, batteries, juice pouches, and glass are other materials that create points of confusion between what is communicated by the hauler, processor, and/or county. Counties can ensure that the information they are presenting to their communities on behalf of the hauler is consistent across the region to avoid confusion and work with the contracted hauler to ensure accurate and consistent information is presented to recyclers.

IMPROVEMENTS TO SUPPORT MATERIALS MANAGEMENT

Acknowledging that Networks Northwest is seeking out regional improvements, those that are listed below can be implemented either individually by county, by multiple counties desiring to collaborate, or by all counties in a comprehensive way.

Community Access

The Recycling Partnership reports that 84% of Americans view recycling as a valuable public service. Yet, Michigan has just a 19% recycling rate. Efforts to increase recycling participation will not be cookie-cutter. Each community is unique and will require a combination of approaches to raise participation and increase the amount collected.

DROP OFF RECYCLING

The majority of communities in the Networks Northwest region rely on recycling drop-off stations to provide access to recycling for residents. While drop-off stations are important infrastructure to have in all communities, regardless of the availability of curbside recycling, their overall effectiveness must be carefully assessed. Locating them conveniently, in commonly trafficked areas, and close to other basic services (such as grocery stores) are key elements that support overall effectiveness.

Drop-off stations for traditional recyclables have been a tried-and-true way for local governments to provide a basic level of recycling services for relatively low cost. However, the costs of operating these sites continue to climb. Illegal dumping, site maintenance, willing hosts, and well-intentioned businesses using the drop off stations is creating a perfect storm for counties and municipalities in their desire to continue to operate drop off stations. Grand Traverse County recently closed a drop off site due to recurring issues with illegal dumping and abuse; Leelanau County had to relocate a drop off site due to the unwillingness of the site host to offer continued use of their property; multiple counties are expecting to see a rise in contracted costs for servicing (emptying) the recycling boxes at their drop off sites.

A theme in stakeholder surveys was the frustration with site upkeep. The condition of the recycling drop off sites (roads, dust, potholes, ice) are a clear barrier to participation.

The recently adopted updates to Part 115 include specific benchmark recycling standards for drop-off recycling. By January 1, 2032, in counties with a population of less than 100,000, there will be required is at least one drop-off location for each 10,000 residents without access to curbside recycling at their dwelling, and the drop-off location is available at least 24 hours per month. In counties with a population of 100,000 or more, there is at least one drop-off location for each 50,000 residents without access to curbside recycling at their dwelling, and the drop-off location is available at least 24 hours per month.

CURBSIDE RECYCLING

Curbside recycling can be a convenient and efficient means of collecting recyclables from residential sources. However, it can be a challenging service to provide cost effectively if the housing density is insufficient to balance transportation costs. Many parts of Networks Northwest do not have enough residential density to justify curbside recycling, but larger cities, villages and all or parts of adjacent suburban townships typically have the required density. A good density indicator that justifies curbside recycling is the "urban" classification by census tract. Another very practical indicator is the boundaries of natural gas service pipelines.

There is significant interest in introducing curbside recycling from a handful of communities, including parts of Leelanau County and Charlevoix County. Stakeholder surveys show that access to convenient recycling is a primary barrier in recycling participation. Counties that have communities or portions of communities with sufficient population density per square mile should evaluate the ability to bring curbside recycling to those communities. In fact, some or all of these areas may be covered in the recently adopted updates to Part 115 that include specific benchmark recycling standards for curbside recycling. The first phase must be in place by January 1, 2026, where at least 90% of single-family dwellings in urban areas as identified by the most recent federal decennial census must have curbside recycling services. The second phase must be in place by January 1, 2028, where at least 90% of single-family dwellings in municipalities with more than 5,000 residents must have access to curbside recycling.

BUSINESS AND INSTITUTIONAL RECYCLING

In most cases, businesses and institutions are not physically restricted from using the drop-off stations. However, in some cases the funding mechanism for the recycling program relies on residents to pay a small fee each year through several different approaches codified in Michigan statute. ~~This fee is built into the tax structure.~~ Benzie County, for example, uses PA 69 for funding in which each household in the county pays $25 per year to provide them access to the recycling drop-off containers located throughout the county, available 24/7. In this case, implementing additional funding mechanisms was needed to support access for these commercial and institutional users. Businesses and institutions in Benzie County are encouraged to subscribe to the same program (rate adjusted based on volume needs, presumably based on the impact to the system cost) and receive the same level of access, however there is no physical barrier (restricted access, limited hours, staffed location) that supports this initiative. In this way, Benzie County is acknowledging the need to provide access for businesses to recycle however the mechanism being used may need to be more robust in order to achieve the higher levels of access and participation that will increase overall diversion in the County.

PUBLIC EVENTS AND PUBLIC SPACE RECYCLING

Though exponentially more complicated than residential recycling, providing public space and event recycling is a public-facing acknowledgement that communities are striving for excellence in recycling services. Particularly in jurisdictions with active pedestrian corridors and large gathering sites (fairgrounds, festivals, concerts, downtown parks, beach and shoreline venues, etc.), public space recycling can be a positive addition to the basic level of services provided, such as trash, restrooms, and public safety. Providing these services reinforces the public commitment that is being made to recycling, building a lasting culture of recycling participation across the County.

COLLECTION OF FOOD WASTE

Even with yard waste banned from landfills, organic materials make up between 30 and 40 percent of municipal solid waste disposed in Michigan. This is comprised of a combination of scraps and cuttings from residential,

commercial and institutional food preparation and processing (carrot stems, banana peels, etc.) and wasted food (edible food that was wasted due to overages in prepared food, spoilage, or uneaten food).

Approximately 16,000 tons of food waste is available in the disposal stream in Networks Northwest. [2] Because this is currently mixed into municipal solid waste and transported to a landfill, recovery at the landfill is impossible. Recovery requires source separation at the point of generation and a distinct collection method to keep the source separated organic material free from contaminants. Commingling food waste with waste that contains pathogens, chemicals or other non-organic debris could compromise the integrity of the processed food waste that will be reintroduced into the economy, likely in an agricultural or landscape application.

In areas where curbside collection of trash and recycling is mature, the next logical step may be to offer curbside organics collection that includes food waste as well as yard waste. Of course, the provision of this service is contingent on the availability of a reliable, year-round organics processing facility.

In areas where curbside collection of yard and food waste is not practical, drop-off centers are a way to offer residents and businesses an option for ensuring their food scraps don't end up in a landfill. A handful of communities across Michigan, including Ferndale, Ottawa County, and City of East Grand Rapids, have implemented, or are piloting residential food waste collection points within their communities.

MULTIFAMILY ACCESS

Residents that live in multifamily housing structures are often ineligible for municipal recycling programs. This can be caused by the commercial nature of multifamily services, because of the contracting that takes place by property management firms, or by the cumbersome nature and lack of storage capacity for a multitude of individual carts that typically support curbside recycling services. There are several mechanisms to enable provision of recycling services to residents that live in multifamily housing, and drop-off recycling access is the primary approach. If curbside recycling is mature in the surrounding area, then recycling carts can be positioned adjacent to trash dumpsters and/or their corrals. That service stop can then be added to the curbside recycling route. Alternatively, if a dumpster-based recycling collection service is available in the area (rear packer or front-load), or if the drop-off system is serviced with a dumpster-based system, then the recycling truck routes can be expanded to include these multi-family housing structures.

HOUSEHOLD HAZARDOUS WASTE

Frequent collection opportunities are key to encouraging residents to properly dispose of household chemicals, like automotive products, lawn care products, pool chemicals, and other flammable, poisonous or reactive materials. Most communities across Networks Northwest offer one to three one-day events during warm-weather months for residents to dispose of these items, which forces them to decide the least harmful way of disposing of them if they can't keep them until one of these collections. Often this results in residents leaving them behind when they move, dumping them down the drain or into the environment, or "donating" them to a non-profit organization, like Goodwill, or illegally dumping them at a recycling drop-off station. Ultimately these actions place the cost and responsibility burden on someone else to "deal with" the products.

---

[2] Michigan Recycling Economic Impact & Recycled Commodities Market Assessment, 2019, EGLE, https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Recycling/Michigan-Market-Development-Report.pdf

Facilities and Infrastructure

Infrastructure that can receive and process the collected materials must be robust and reasonably close the collection points to keep the collection and transportation costs low. Separating these materials at the point of generation (source separation) is critically important to maintain a high value and low cost for processing.

These facilities may include:

- Recycling processing facilities, commonly known as Material Recovery Facilities or MRFs.
- Organics processing facilities, which may include compost sites,
- Aggregation sites, where materials are received from various transporters to be collected in larger quantities and volumes.
- Recycling transfer facilities, where recyclables are collected and then prepared for efficient transport (usually by compaction) to a processing facility.
- Beneficiation facilities, where a material is taken for further processing before being marketed.
- Dual stream recycling facility/MRF, that receives fiber (paper, cardboard) is collected and kept separate from plastics, metals, and glass to improve efficiency and quality of outbound commodities.
- Single stream recycling facility/MRF, that receives fiber (paper, cardboard) commingled with plastic, metal, and glass at the point of collection and separated during processing using human and mechanical sortation.

ORGANICS PROCESSING FACILITIES

If reducing the amount of food waste is not possible or practical, composting is the most cost-effective option for recycling it. On-site composting is a no- or low-cost option for residents and small businesses and can be as simple as a static pile of organic materials left to naturally decompose. Proper ratios of different nutrient-rich materials must be attained to reduce the chance of vermin or odors. More advanced engineering approaches can be used to speed up the decomposition process, including low-tech windrows to capital-intensive digesters.

Table 6 Types of Organic Processing Approaches

TECHNOLOGY	TYPE	DESCRIPTION	TIME TO FINISHED PRODUCT	APPLICABILITY
WINDROW	Outdoor open air	Organic material is mixed and formed into long trapezoidal rows. Material is periodically turned and mixed.	3-9 months	Food waste must be adequately mixed with yard debris and bulking agents (wood chips) to balance the carbon-to-nitrogen ratio (C:N) and follow “best practices” for odor prevention.
STATIC PILE	Outdoor open air	Air is pumped into large pile to speed decomposition.	1-2 years	As above, need to balance the carbon-to-nitrogen ratio (C:N) and follow “best practices” for odor prevention.

AERATED STATIC PILE	Outdoor, indoor, or in-vessel System	Household organics are mixed with higher carbon-content materials and formed into long cylindrical rows and encased in a plastic bag "sleeve". Air is introduced into the bags.	4-6 months	Popular for animal manures and growing in application for additional high-nitrogen materials. As above, need to balance the carbon-to-nitrogen ratio (C:N) and follow "best practices" for odor prevention.
ANAEROBIC DIGESTION	Outdoor enclosed anaerobic	Organic material is typically mixed and warmed in a closed, airtight tank. Microorganisms break down or "digest" organic material without the presence of oxygen, typically for 6 weeks. Energy recovery from methane generation is common.	15-40 days	Household, industrial, institutional, and commercial organics (e.g. food waste) provide excellent nutrient sources in the digester. Not a solution for large amounts of yard waste.

SPOKES TO FEED HUBS

Hub and spoke models rely on economies of scale to find efficiencies in collection, transportation, and processing to increase access to markets which drive value and demand of the commodities up.

Figure 4 shows a scenario for the development of a hub and spoke network across Michigan for recyclables and organics. The two hubs in Region 10 are located in Grand Traverse and Emmet Counties, with connecting 'spokes' located across the region. In this scenario, the spokes would feed the hubs with proportional amounts of recyclables and organics from the surrounding less densely populated areas. The hubs are then positioned to process and ship larger quantities of these materials at lower overall costs per ton.

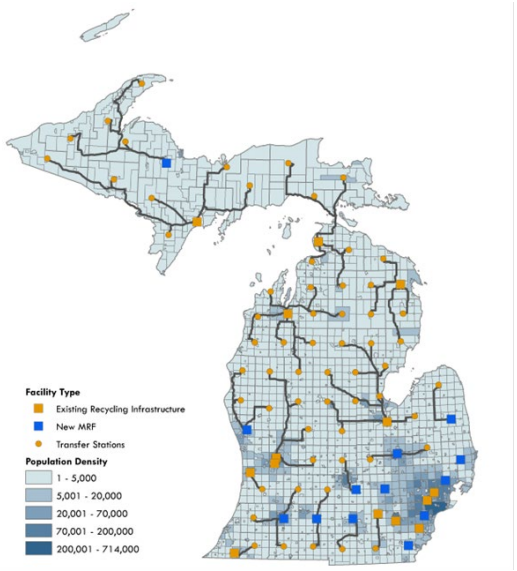


Fig 4 Hub and spoke scenario for collection across Michigan. Source: 2019 Michigan Recycling Economic Impact & Recycled Commodities Market Assessment

CENTER FOR HARD TO RECYCLE MATERIALS

Called various names, including Center for Hard to Recycle Materials (CHaRM) and Super Drop-off, comprehensive drop off centers are vastly underrepresented across the state. These facilities offer multiple services at a single location but do not require significant infrastructure investment. Often, they are collocated at transfer stations, MRFs, recycling drop off stations, compost facilities, DPW yards, fairgrounds, or road commissions. These are staffed (full time or part time) facilities that are gated when not in use. Ideally every county and every large community would have one to ensure frequent access to important programs and services, like HHW collection, food waste collection, scrap metal collection, tire collection, e-waste, carpet, mattresses, and other services that are not currently available on a regular basis.

Robust Markets

Northwest Michigan boasts many attributes but proximity, cost effective and efficient transportation of recycled materials to intermediate processors and end-users is not one of them. Geographically, most of the counties encompassed by Networks Northwest have one or fewer state highways traversing them, with most relying on local roads for the majority of transportation needs.

Figure 5 Michigan Department of Transportation rail map

Given the distance to potential end markets, rail can be a cost-effective mode of transportation, depending on the commodity type, volumes, and locations proximal to rail spurs. Using existing rail lines and building a hub-and-spoke system, the movement of difficult-to-transport materials may become more practical.

These rail-based transportation corridors may be part of the solution to the challenges of cost-effective movement of recyclables to markets.

MATERIALS FOCI

Focused promotion and/or special collections of source separated materials that can be transported to markets, can provide excellent opportunities for raising awareness and improving diversion.

GLASS

High value glass recycling is a particular challenge in Northern Michigan. The dispersed, rural network of collection points in the region, coupled with the high cost of transportation and the significant weight of glass create a difficult decision-making matrix for leaders who desire to recycle glass but cannot justify the expense.

Markets exist for mixed glass cullet, but they are outside the state. Glass that is processed at most MRFs needs additional cleaning, or beneficiation, before being introduced as a feedstock. Even as an aggregate substitute, most single stream MRF glass must undergo some level of decontamination to remove plastic debris.

Strategic Materials has collection and processing facilities in Northern Illinois and Northern Indiana; Rumpke operates a glass beneficiation facility in Northern Ohio. Both are good candidates as intermediate processors for glass from Northern Michigan. However, as a material collected through single stream recycling, glass is being devalued and used for a lower purpose as landfill cover. Building on the hub and spoke approach, a consolidation site in the northern part of the state to aggregate glass from the region is likely part of an affordable and functional solution. If co-located on a site with rail access then costs to deliver the glass to market could be significantly lowered. Industry partners, including glass processors from out of state, have expressed interest in this aggregation hub and spoke approach.

Glass is a pertinent material to consider for rail transport, particularly if small volumes of glass could be transported over-the-road from 'spokes' and aggregated at a central collection 'hub' that has access to a rail spur. Figure 1 (in full detail in Appendix D) shows the Great Lakes Central (GLC) rail line running as far north as Little Traverse Bay in Petoskey (Emmet County), through Antrim County and Kalkaska County, being joined by another GLC line that runs from northeastern, central and southern Grand Traverse County before joining the main line at the Grand

Traverse/Wexford County border. It then runs through Cadillac in Wexford County, being joined by another stub that connects to Yuma in Wexford County. A second rail line, Marquette Rail (MQT), begins along the shoreline in Manistee and traverses southeast into eastern Mason County and western Lake County before passing through Newaygo and the heart of Kent County.

POLYPROPYLENE

The interest, investment, and value of polypropylene (PP) has grown in recent years due to the attention it is getting from industry collaborations, like Polypropylene Recycling Coalition. In their words, "The Polypropylene Recycling Coalition is focused on increasing access for people to recycle polypropylene through curbside recycling programs, ensuring more recycling processing facilities can sort the material successfully, and stimulating a robust end-market of high-quality recycled polypropylene for reuse in packaging. The Coalition is part of The Partnership's Pathway to Circularity, an initiative creating scalable solutions to packaging and system challenges and accelerating the shift to the circular economy that uses fewer finite resources."

Figure 6 Images of PP for outreach materials from The Recycling Partnership

Both major Material Recovery Facilities operating in the region (Emmet County Recycling and GFL) accept PP in their recycling programs. The Recycling Partnership believes there is as much as 17 pounds of PP generated per household per year, creating a significant opportunity for additional education focused on recovery of this material. Particularly high volumes of PP are found in residential circulation in recent years with the rise in takeout food orders that use PP containers.

PAPER CUPS

Paper mills in the Midwest have committed to accepting paper cups in the mixed paper stream or as a Grade 52 bale (comprised of aseptic and gable top cartons). Both types/grades of paper are generated at both Emmet County and GFL in Grand Traverse County. Emmet County does explicitly include paper cups as recyclable as a 'mixed container'. GFL does not explicitly include paper cups as recyclable in their outreach materials however they do receive some and they are sorted as mixed paper. Missaukee County's Recycling Center does not accept paper cups.

Paper cups are made with long, bleached fiber that are highly desired by paper mills because it adds strength and quality to new products made with recycled fiber. To date, there are 25 paper mills across seven companies in North America that accept residential mixed paper bales with paper cups included. Additionally, there are 5 mills/facilities across three companies that accept paper cups into bales of aseptic and gable top

Fig
Fo

cartons ("Grade 52" bales). Participating paper mills have performed pulpability testing and/or mill trials to determine their ability to successfully recover fiber from paper cups and use the fiber in their furnish.

To provide a liquid barrier to the fiber, paper cups have a coating either on the inside (for hot drink cups) or on both sides (for cold drink cups). The pulping systems in use at our mills can separate the coatings from the fiber and recover the fiber as a feedstock for new products. Yield from the cup is in the 70 to 90 percent range, depending on whether the cup has a single- or double-sided coating and the pulping system in use. These fiber products go on to be made into a variety of everyday items such as cereal boxes, facial tissues, and new paper cups

Material recovery facilities (MRFs) can add paper cups to their accepted material list, as well as contracts, if bales are sold to one of the listed mills. Notably, Great Lakes Tissue in Cheboygan, MI is a mill with significant demand for cups and cartons and within a good distance for transportation purposes. Communities can advocate for the inclusion of paper cups in their recycling stream by working with their waste haulers and MRFs.

Founded in 1933, the Foodservice Packaging Institute is the trade association for the foodservice packaging industry in North America. FPI promotes the value and benefits of foodservice packaging and serves as the industry's leading authority to educate and influence stakeholders. Members include raw material and machinery suppliers, manufacturers, distributors, and purchasers of foodservice packaging.

"Paper cups can be recycled when there are three elements present: demand from an end market buyer; proper sorting at the material recovery facility (MRF); and public education to recycle cups through residential programs," said Natha Dempsey, president of FPI. "Increasingly, these factors are coming together to create recovery pathways for paper cups.

CARTONS

Cartons and carton recycling includes refrigerated fiber-based containers used for milk, juice, half and half, and other refrigerated items. These are called 'gable top' cartons and contain approximately 80% paper and 20% polyethylene. A different type of carton is called 'aseptic' because they do not require refrigeration if unopened. These generally store soups, milk, juice, wine, and water, among other products. Aseptic cartons are typically comprised of 74% paper, 22% polyethylene, and 4% aluminum in multiple layers.

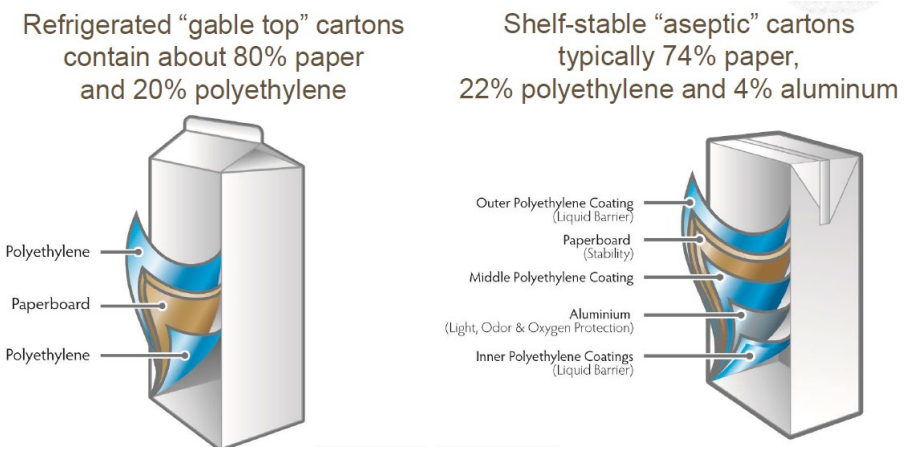


Figure 8. Gable top and shelf-stable carton composition

These carton containers have high value because they are made using 100% virgin fibers that do not contain ink, therefore no de-inking is required. They have a high yield for mills, making them more valuable than other types of

fiber. In a recycling stream, cartons comprise between ½% or higher, by weight, of the entire throughput at a Material Recovery Facility.

Notably, Great Lakes Tissue in Cheboygan, MI is a mill with significant demand for cups and cartons and within a good distance for transportation purposes. Communities can advocate for the inclusion of cartons in their recycling stream by working with their waste haulers and MRFs.

The Carton Council is an industry organization committed to growing carton recycling in the U.S. By promoting both recycling technology and local collection programs, as well as growing awareness that cartons are recyclable, we work to limit the number of cartons that become waste. They've had significant success in just over a decade by helping to bring carton recycling to the majority of households across the United States. Emmet County worked with the Carton Council in recent years to install equipment to enable them to sort cartons at their MRF; GFL has not worked with the Carton Council but explicitly accept cartons for recycling; Missaukee County Recycling Center explicitly does not accept cartons for recycling.

Though small in quantity compared to the volume of recyclables processed at a MRF, cartons are growing in their use in residential consumer applications, can be readily sorted at MRFs, and have an accessible market.

ORGANICS

Many stakeholders across the Networks Northwest region responded favorably in the surveys to the addition of some level of food waste collection. Organic materials, like food, soiled papers, and miscellaneous organic matter comprises a significant portion of the waste stream – between 30-40% by weight.

When sent to a landfill, the waste is covered with a thin layer of soil and then with more trash. This layering effectively removes the oxygen from the decomposition process, creating anaerobic conditions which create landfill gas. Landfill gas is composed of roughly 50% methane and 50% carbon dioxide (with minor amounts of non-methane organic compounds). Methane is a potent greenhouse gas that is 28 to 36 times more damaging than CO2 in its effectiveness at trapping heat in the atmosphere. [3]

On the other hand, when handled separately from municipal solid waste, organic materials can be composted or otherwise decomposed under controlled conditions that ultimately produce a valuable addition to the environment and the economy. Compost is a highly valued material used to supplement home-scale, landscaping, and large agricultural applications to support root growth and moisture-holding capacity of soil. In this way, compost is a natural fertilizer.

BULKY WASTE/HARD TO RECYCLE ITEMS

Residents are increasingly seeking options to recycle or otherwise not dispose of bulky items and other non-traditional recyclables in the trash. These items include mattresses, furniture, and textiles as well as paints, tires and bulky plastic items like crates and tubs. Electronics and batteries also require special handling and demand is high for access to recycling drop offs for these materials. . As an industry, there is acknowledgement that these types of items can be recovered, but the effort to do so is much more significant and requires some level of disassembly or special handling.

---

[3] EPA Landfill Methane Outreach Program https://www.epa.gov/lmop/basic-information-about-landfill-gas#:~:text=Landfill%20gas%20(LFG)%20is%20a,of%20non%2Dmethane%20organic%20compounds

SHARPS

At a residential level, needles, lancets, and other home-generated 'sharps' are not regulated. As such, many of these dangerous discards end up in trash cans and result in serious medical concerns for waste and recycling workers who experience 'sticks' while handling trash during their routine job duties. A 2018 study by the Environmental Research & Education Foundation and Solid Waste Association of North America found that over half of U.S. and Canadian MRFs indicate needles are routinely observed in the recycling stream a few times per week, most commonly mixed in with plastics. Fifty-six percent of these facilities reported one or more needle stick injuries in 2016. These injuries result in over $2 million in direct treatment costs and monitoring, but more importantly they cause distress for the people injured because they don't know if they've been exposed to a bloodborne disease that will impact their life.

With the number of residents treating themselves with needs and other sharps at home, this issue will only increase in urgency and solid waste agencies and recycling coordinators will be looked to as resources for responsible and safe disposal of sharps.

PRESCRIPTION AND OVER-THE-COUNTER DRUGS

Safe disposal of prescription and over-the-counter medications has become important for both the preservation of the environment and public health and safety.

Many law enforcement offices participate in the federal Drug Enforcement Agency's drug disposal days in the spring and fall each year. Increasingly, these law enforcement offices are offering routine (daily) collection points for medications at their offices. Law enforcement officers have the unique ability to possess distributed (prescribed) controlled substances without a prescription, unlike any other individual. They also have the ability to transport these substances, which makes them important stakeholders in the safe disposal of medications of all types.

Recycling coordinators can help provide resources for programs that are administered by law enforcement offices to ensure medications are not flushed down the drain or dispose in trash or recycling by mistake, through misinformation, or out of ignorance.

CONSTRUCTION & DEMOLITION (C&D) DEBRIS

Conservative estimates suggest that wood, drywall, cardboard, siding, glass, shingles, and other construction and/or demolition debris may comprise at least 20% of the amount of waste landfilled each year. These items are generally oversized, heavy, not suitable for processing at a residential Materials Recovery Facility. Instead, they require either source separation, by separating like materials at the construction site, or development of a construction and demolition processing facility. GFL operates a C&D processing facility in Kalkaska but the scale and scope of materials that are collected and recycled is unknown.

In addition, these materials have distinct markets that are often less robust than those of traditional recyclables. Development of markets needs to be considered alongside the development of infrastructure to adequately manage this unique but voluminous type of waste.

CORRUGATED CARDBOARD

People often struggle to have adequate space in curbside recycling carts for corrugated cardboard, particularly oversized boxes. While generally high in value, OCC (old corrugated cardboard) as a commodity has shifted

significantly in where it is generated. Traditionally corrugated cardboard has been generated at retail stores when they unbox products to put on display on store shelves. The evolution of online shopping where items are shipped directly to the buyer instead of to brick-and-mortar retail has shifted the generation of cardboard to the residential waste stream. Residential recyclers often struggle with the volumes of cardboard, but know this material is widely recyclable.

As a clean and high volume material, distinct collection points for corrugated cardboard could supplement recycling drop-off stations at central collection points or at private or public locations that desire to be a partner. Manistee County has partnered with Packaging Corporation of America (PCA) to provide these 'cardboard only' drop offs.

FOAM

Expanded polystyrene (EPS) foam is not typically accepted in curbside or drop-off recycling programs due to its difficulty in successfully being recovered in a mechanized materials recovery facility. As a source separated material, EPS foam is recyclable, but needs pre-processing to make shipment more efficient. Foodservice Packaging Institute reports that foam products are over 90% air, so densifying it (compacting it to remove the air) is necessary so it can be transported more cost-effectively. Foam Recycling Coalition reports that there is one collection point in Northwest Michigan for foam, on Beaver Island. [4]

Public/Private Partnerships

Economic development agencies have become strong allies to businesses seeking incentives, funding and access to post-consumer and post-industrial recycled content. They have additionally begun to understand and embrace the value of working with local, regional, and state governments and non-government organizations that are driving circular economy initiatives. There are a range of ways that the tools of public/private partnerships (procurement approaches, development agreements, joint financing and design, build, operate projects) can be expected to achieve the region's diversion goals.

Economic development agencies, such as Northern Lakes Economic Alliance, Grand Traverse Economic Development Corporation, Thrive North/Alliance for Economic Success (AES), Northern Initiatives, and, at the state level, Michigan Economic Development Corporation (MEDC) are all likely candidates to bring closer to county- and Networks Northwest-led initiatives that are producing materials fit for 'consumption' by end markets and intermediate processors interested in the Northwest Michigan market.

Universities and community colleges have particular interest in research and development projects that contribute to student and faculty development. They also offer unique waste streams that are residential in nature but are treated as commercial, putting them in a valley with regard to service.

NEXTCYCLE MICHIGAN

NextCycle Michigan (NCMI) is an excellent example of how the State of Michigan through both EGLE and MEDC is able to incubate and accelerate the kinds of innovations in public private partnerships, intergovernmental programs and services and supply chain B2B partnerships that will increase the overall diversion of recyclables in NN. A number of both public and private organizations and agencies in the region have already benefitted from the

[4] Foam Recycling Coalition, https://www.recyclefoam.org/about-foam-recycling

NextCycle Michigan Innovation Challenge Tracks that have established examples of best practices for recycling that are ready to be scaled across the region with NCMI, EGLE and MEDC support.

Three of the Innovation Challenge Tracks have direct application to the Networks Northwest Region. The Recycling Supply Chain (RSC) Track provides direct opportunities to address gaps in the recycling supply chain, from point of collection at the home, business, institution, or drop-off to the processing plants and then to market, including the material handling and logistics challenges along the way. Glass is a good example of a project that could benefit from this track. The I2P3 Track (Intergovernmental Initiatives and Public Private Partnerships) is designed to support collaboration across governmental jurisdictions for expanded recycling services. The RIT Track (Recycling Innovation and Technology) supports the types of infrastructure developments that can bring the latest in technology innovation to the regions expanded recycling systems.

NCMI also as a "Build to Scale" partnership track funded with Federal Economic Development Administration (EDA) that is designed to support scaling efforts in underserved and disadvantaged urban, rural and tribal communities across the state – directly applicable to the NN Region.

Finally, NCMI supports Renew Partnership Projects that are developing in real time and bringing so called "shovel ready" projects the kinds of targeted support that are needed to address hurdles that typically challenge these initiatives – site selection, partner development, financing, ramp-up, coordination with stakeholders, customers and other potential service allies.

Supportive Policy

Many communities in Networks Northwest utilize policy to partially fund or support their recycling initiatives. For example, Emmet County relies on a county-wide ordinance dictating flow control and pay as you throw waste flow to ensure waste reduction is promoted and incented. Grand Traverse County implemented a county-wide ordinance that ensures curbside recycling access is guaranteed to all residents living in single-family residences up to a 4-plex. Several counties utilize PA 69, which allows them to collect a surcharge from residents to fund recycling, composting and/or household hazardous waste programs. Ordinances and millages are also a common tool used by the region's Townships, villages and cities to establish standards for access to recycling services.

Sufficient funding is critical to a growing materials management system. Policy can be a mechanism to ensure funding. Without a consistent and reliable source of funding, program growth will be stifled despite the clear desire of the community and recycling coordinators to grow access and participation in existing and new programs. Policy can also be an important tool to ensure equitable access to services. A summary of policy levers related to recycling and other public works functions that are available to counties and municipalities is listed below.

SPECIAL ASSESSMENTS

Special assessments are charges against real property, such as land and structures, for an improvement or service that provides a benefit to those living in the special assessment district. They can be used by municipalities to fund projects or services that otherwise would not be possible, like road repairs, water and sewer mains, street lighting, police and fire protection, and garbage and recycling services. They can be used in conjunction with general fund revenues, service fees, user charges, grants, or other sources of funding.

Examples of special assessments that are commonly used to fund garbage and recycling collection and facilities include:

- Act 188 of 1954 – Township Public Improvement Act
- Act 116 of 1923 – Township and Village Public Improvement and Public Service Act
- Act 342 of 1939 – County Public Improvement Act of 1939
- Act 233 of 1955 – Municipal Sewage and Water Supply Systems
- Act 185 of 1957 – County Department of Public Works
- Act 69 of 2005 – County and local units
- Act 76 of 1965 – Joint Water Supply and Waste Disposal Systems

Public Act 138 authorizes counties, through resolution of their Boards of Commissioners, to collect a household fee or surcharge not to exceed $25 per household per year for waste reduction programs and the collection of source-separated materials for recycling and composting. This includes household hazardous waste, tires, batteries, yard waste, and recyclable materials. PA 138 is commonly used across Michigan to support a basic level of service to residents.

Public Act 69 expands the opportunities offered by PA138 by doubling the fee up to $50 and extends service offerings to businesses. The funding amount is up to $50 per business per year which may limit the ability of the county or local government from providing convenient access to some programs, such as regular collection of household hazardous waste, expanded recycling services for non-traditional materials, or community compost collection. For those counties that do not utilize any policy but desire to introduce basic programs with the assurance of funding, a special assessment, such as PA 69, could be considered as a first step. In developing a PA 69-based recycling program, steps can be taken in its design and scope that enable business and institutional generators to access the recycling services and contribute to the cost of providing those services.

ORDINANCES

Ordinances are pieces of legislation that can be enacted by a municipal authority, at the county, city, township, or village level to achieve the desired goals. In this way they become local law, carrying the same effect as a state statute within the jurisdiction's boundaries.

Waste-related ordinances at the local level commonly address blight and general property maintenance. Some communities take a broader approach to local ordinance to require specific actions of homeowners and/or service providers. For example, Grand Traverse County has an ordinance (Ordinance 17) that requires all residents in single-family up to 4-plex in the designated curbside recycling district to have curbside recycling available through their contracted waste hauler as a bundled rate. That is, the resident is charged a single rate for the provision of both trash and recycling services, whether they use both or not.

OTHER FUNDING MECHANISMS:

Landfill Surcharge
Counties that have a landfill within their boundaries can impose an surcharge of a specified amount on all solid waste coming into the landfill. The operator of the landfill must collect the surcharge and pay it to the county for the designated use.

Disposal Facility Surcharge
Counties that have their own disposal facilities that are not landfills can establish rates such that waste that passes through the facility is imposed a fee that supports the recycling programs.

Intergovernmental Agreements
Local units of government – with or without the support of the county – can use intergovernmental agreements to establish rules that place requirements on waste haulers to achieve certain recycling goals.

Hauler Licensing
Though not a significant source of revenue, many communities in Michigan elect to require waste haulers (and other similar service providers) to register. This registration allows them to better understand who is doing business in their community to be able to address issues that may arise. Additionally, hauler licensing can require tonnage reports to be submitted periodically. This valuable information allows community leaders to observe flows of waste inside and outside the jurisdictional boundaries to assist with planning efforts.

Dedicated Millage
Incorporated cities and charter townships are authorized by state statute to charge an additional millage for solid waste and recycling services. No public vote is required. Alternatively, any local unit of government or county can seek a vote of the people for a temporary or permanent millage to fund a solid waste or recycling program. City of Grand Rapids and Charlevoix County are among Michigan jurisdictions using this approach.

Fee
A household fee can be collected to fund a recycling program, if approved by voters.

Hauler Contracting
Municipalities and counties can opt for a single hauler, selected through a competitive bid process that occurs at regular intervals, that provides exclusive service to the designated jurisdiction(s). A single hauler contract generally providers lower rates for residents because of the assurance to the hauler that they have the entire route, creating great efficiency. Municipal leaders and residents generally appreciate not having multiple waste collection vehicles from different companies driving down local roads, as it reduces wear and tear on the road surface. However, some residents resent not having the ability to select the company they desire. Within Grand Traverse County, Acme and Peninsula Township have enacted local ordinances – 2011-01 and 2011-43, respectively, setting forth the requirements of how and when trash and recycling are to be collected under the township-wide ordinance.

Education and Outreach

Consistency in messaging across an impacted area is critical to consumer confidence in the value of recycling and waste diversion. This is increasingly difficult with the barrage of national media 'crises' regarding recycling being presented broadly which evoke confusion, frustration, and doubt.

RECYCLING COMMUNICATION

Best practice for recycling communication dictates that the mill should relay to the processor (MRF) who then relays information to their hauling customers who then push communication out to customers. This is rarely the way communication happens when it comes to clearly indicating what is recyclable, however it should always be prioritized as the best way to communicate.

Signage, promotional materials, and recycling guidelines are all fundamental components of an educational campaign that provides participants with guidance on what to recycle. Whether the "recycling rules" change from time to time or not, people need to be reminded what they can put in recycling carts or drop off boxes. If there are no rules posted or no information easily accessible, they will likely make up their own rules which leads to bad habits and misguided intentions, which results in contamination.

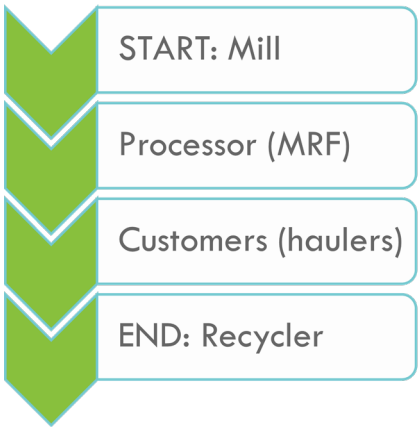


Figure 9 Best practice hierarchy for disseminating recycling guidelines.

The most frequently mentioned comment/request in the stakeholder survey was the need for more information on what is recyclable. People are hungry for this information and seek it out, so posting it in an easy-to-access location and keeping it current is critical. Survey respondents also indicated that they look to counties for recycling information first – ahead of their own hauler – so counties have a unique opportunity to promote 'right recycling.'

Recycling coordinators also widely expressed a desire to have a consistent message across the region. From signage at recycling drop off sites to social media messaging that can carry across multiple counties, the desire exists to collaborate on the public-facing message about recycling in Northwest Michigan.

PARTNERS

Identifying strategic outreach partners will provide significant intersection points within communities:

- Airports offer another unique lens to materials management, having tenants that include major airlines, national car rental agencies, restaurants, and countless visitors that are impacting the waste generated on a fairly small footprint. In 2021, TVC (Cherry Capital Airport) in Traverse City saw a record 602,626 passengers pass through the airport in a single year, an increase of over 20,000 passengers from the previous record (in 2019). [5]
- Libraries, similar to airports, have many visitors of varying demographics. This setting can present opportunities for promoting programs, presenting information, and gathering feedback from stakeholders.
- Schools, particularly those districts that have their own custodial staff and are in control of their waste hauling contract, can be ideal settings for hands-on student learning. From early elementary through high school, service learning and capstone projects abound for students to better understand the recycling system within their school and, more broadly, within their community.
  Michigan Green Schools, now administered through the Michigan Department of Environment, Great Lakes, and Energy, gives schools a specific set of achievements needed to meet the designation of 'green school', which can be a source of pride for the children, teachers, administrators, and parents. Though not required, this program allows for many grade-appropriate recycling-related activities.

Additional partners to consider include:

- Universities
- YMCA and similar community programs
- Major employers, especially those that have corporate sustainability initiatives already in place
- Ballparks, arenas and other event spaces

BRANDING

Developing a regional brand that identifies the local availability and cohesive effort to recover recyclables and organics in multiple locations can greatly benefit outreach efforts by creating a recognizable theme that creates a sense of community. Grand Rapids and Kent County, Michigan co-own and administer the SORT (Separate Out/Organics Recycling and Trash) brand. Emmet County has successfully developed its own recognizable brand for recycling outreach and education, with continuity reflected across websites, bin labels, and all outreach materials in the county and partner county where recyclables are transported to Emmet for processing. Emmet provides a template to all partner counties to ensure recognizable common brand elements are incorporated to provide cohesive messaging around best practice recycling, while each county preserves its own unique colors or logos.

Figure 10 Branding can bring distinction to local recycling programs while still providing flexibility in different applications

[5] Cherry Capital Airport, https://tvcairport.com/wp-content/uploads/2022/01/2021-TVC-Airport-sets-new-annual-record-of-passengers.pdf

Regional Planning

Networks Northwest has maintained an active Materials Management Advisory Committee, despite not being required to have active solid waste planning committees. This is commendable and should not only be continued but further activated. The recent changes to state materials management planning will require significant efforts for each county and the entire region to not only meet the requirements of the law but the needs of the communities.

The changes to state solid waste law have implications that carry across all facets of solid waste management in counties. Those who work in the solid waste and recycling field know well that waste does not follow political boundaries unless policy dictates. Rather, it flows along transportation corridors that provide efficient and cost-effective outlets to processing facilities and end markets. To this end, regional planning is a logical and fundamental approach to ensuring counties consider externalities that would benefit their planning efforts. With the passage of P115 legislation in late 2022, considerable changes are coming to regional planning. The new planning process focuses on materials management instead of landfill capacity, which reflects a significant improvement. One significant change is that county import-export agreements and authorizations are no longer included and greatly restricts counties' abilities to manage where their waste goes for disposal and what waste may come into a landfill located in their county, whether publicly or privately owned.

Benefits of Regional Planning:

- *Increased funding:* Materials Management Plan (MMP) grants will be available to those who file a notice of intent to prepare a new MMP once initiated by the Director of EGLE. These funds cover the local costs for preparing, implement, and maintaining MMPs. Individual counties receive $60,000 each and will receive an additional $10,000 per county to engage in multi-county planning. Counties are eligible for additional per capita funding, up to $300,000 for each of the three years of onset planning.
- *Collaboration:* The removal of import-export agreements requires additional effort to manage regional relationships where movement of waste across borders may impact existing or considered flow control of waste or tip fee surcharges on waste to fund recycling and other recovery efforts. Planning regionally provides a mechanism to align to manage waste flow.
- *Contracting:* Cost savings can be realized from coordination of services that can carry across multiple regions or portions of the regions.
- *Shared Resources:* Counties with similar deficiencies may share in the benefit from identified solutions. Likewise, counties with successful programs and basic infrastructure may be able to support those who have identified gaps and deficiencies.
- *Economies of Scale:* Working collaboratively to build larger volumes of materials, outreach campaigns that can have greater impact based on regionalized deployment, and other efforts that can carry across multiple counties can realize more impact, both from a financial standpoint through having more financial resources to work with and from a materials collection perspective.

Costs of Regional Planning:

- *Intentionality:* Regional planning requires intentionality when making decisions. It forces decisions to be made at a broader level, with consideration of the impacts to members of the regional planning team.
- *Transportation:* Transportation to meetings can be higher, but the evolution of virtual meetings does help bridge this barrier to some extent.

RECOMMENDATIONS

Community Access

Improving access to all members of the community in Northwest Michigan will require collaboration. Due to the rural nature of the region, transportation is a significant barrier for moving materials from one place to another.

DROP OFF RECYCLING

Recommendation: Develop a Task Force to address community access to drop off recycling programs. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties.

Recommendation: Evaluate the role of intergovernmental partnerships to jointly address the need for curbside recycling. These partnerships would still provide autonomy but more easily enables decision-making across political boundaries including standardization around certain collection and service approaches across the region, procurement approaches to lower costs, and funding mechanisms to assure quality services across the region.

Recommendation: Evaluate mechanisms that will reduce illegal dumping, like a gated access to recycling drop off stations, particularly at new locations. Evaluate the cost/benefit of gating and offering drop-off recycling by subscription pass card. This will add administrative costs to the provision of recycling services but will restrict the use of the centers for those who are invested in their success, including reducing illegal dumping and general abuse of the sites. An added benefit of this approach is the potential to broaden eligibility for these services to additional commercial and institutional generators who really want these services and would be willing to pay for them through some type of fee structure (subscription, etc.)

CURBSIDE RECYCLING

Recommendation: Develop a Task Force to address community access to curbside recycling. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties. Identify cities that have an interest in curbside recycling based on household density.

Recommendation: Evaluate the role of intergovernmental partnerships to jointly address the need for curbside recycling. These partnerships would still provide autonomy but more easily enables decision-making across political boundaries including standardization around certain collection and service approaches across the region, procurement approaches to lower costs, and funding mechanisms to assure quality services across the region.

HOUSEHOLD HAZARDOUS WASTE (HHW)

Recommendation: Develop a Task Force to address community access to household hazardous waste programs. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties.

Recommendation: Assess the barriers to providing more frequent HHW collections To control costs, consider providing more frequent HHW collection days that would benefit multiple counties collectively. Where practical, host HHW days in locations that allow participation from adjacent counties. For example, host a collection on the edge of one county and allow participants from the adjacent county. This would reduce the number of times a HHW

contractor needs to be present in Northern Michigan and would provide double the representative staff from the counties. Joint procurement of these services is one mechanism that could be beneficial to provide broader coverage across boundaries and for broader ranges of time – all while realizing lower costs per service unit.

Recommendation: Consider hiring and training staff that can serve as HHW attendants across the region to offer routine collections. Staff would need an initial 40-hour HAZWOPER training and annual 8-hour training courses but would be qualified to accept and sort household hazardous waste on-site in a properly designed HHW building. A number of counties in Michigan offer these types of programs, including Kalamazoo, Kent, Emmet and Washtenaw and include collections multiple times each week, as well as services for small businesses that meet Conditionally Exempt Small Quantity Generators (CESQG) status. Again, joint development of these services is one mechanism that could be beneficial to provide broader coverage while realizing lower costs per service event.

Recommendation: Evaluate the role of intergovernmental partnerships to jointly address the need for increased and improved HHW collections. These partnerships would still provide autonomy but more easily enables decision-making across political boundaries including standardization around certain collection and service approaches across the region, procurement approaches to lower costs, and funding mechanisms to assure quality services across the region.

Infrastructure

Meeting the needs of the region will require new and expanded infrastructure to be able to adequately process the increased volume of materials that will inevitably come from a dedicated planning effort.

Recommendation: Work with the existing operators of Material Recovery Facilities, organics processing facilities, and other material processors to determine their interest and capacity to expand their service levels.

Recommendation: Evaluate where hub and spoke models could support the recovery of more materials, including where the hubs should be located and where spokes can be located to ensure efficient and cost-effective transportation to the hubs. Consider all available transportation means, including rail and ship, based on available ports.

Recommendation: In combination with the analysis of recycling drop off stations, evaluate and develop a plan for the addition of Center for Hard to Recycle Materials (CHaRM) facilities into the infrastructure of drop off stations in selected areas across the NN region. These facilities could accept a variety of items including mattresses, seasonal collections for materials like plant pots and boat wrap, shingles, yard debris, food waste, vinyl siding, and bulk cardboard and would support the hub and spoke model for most recyclable materials in the immediate service area. Networks Northwest already has a service provider doing business in this non-traditional space with the not-for-profit, Bay Area Recycling for Charities (BARC). There are examples of public/private partnership service models with non-profits that could be adapted to enable BARC to operate the CHaRM centers in the region while simultaneously monitoring recycling drop off sites. Builder's Waste is another group in the region that may be a valuable service partner in expanding the scope of these solutions. The CHaRM model could also enable a municipal solid waste component that allows a per-bag disposal rate to encourage waste reduction at the home and a one-stop-shop for residents to dispose of trash, recycling, and other waste at a single location. Finally, a coordinated CHaRM model across the region would allow end-markets and their supply partners (brokers, consolidators, shippers, etc.) to service an entire region to expand total capture of tons of their targeted recyclable material in the region.

Robust Markets

GLASS

Glass is a priority material for recovery but proximity to a processing facility or beneficiation plant is a barrier.

Recommendation: Develop a Task Force to address glass recovery in the region. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties. Volumes, logistics, collection points, and marketing need to be analyzed to understand the true benefits and costs of introducing a different method of collecting glass in lieu of single stream recycling. This information will be key to working with potential industry partners on a transportation and end market solution.

Recommendation: Work with material partners, like Glass Recycling Foundation, Glass Packaging Institute, and Glass Recycling Coalition, to identify opportunities for improved recovery and markets.

Recommendation: Review case studies in Appendix E to learn about how other communities have approached glass recovery and solutions that have been implemented in other parts of the US for applicability to Networks Northwest.

Recommendation: Identify partnerships that enable collaboration on efforts to recover glass, including partnerships with the local wine and spirits industry.

POLYPROPYLENE (PP)

Recommendation: Develop a Task Force to address polypropylene recovery in the region. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties. Volumes, logistics, collection points, and marketing need to be analyzed to understand the true benefits and costs. This information will be key to working with potential industry partners on a transportation and end market solution.

Recommendation: Consider inviting a representative from Polypropylene Recycling Coalition (PRC) to a MMAC meeting for discussion. Regionally, establish a relationship with the PRC to develop an understanding of the funding and other resources available. Foodservice Packaging Institute is also interested n more recovery of PP so jointly meeting for discussion could be beneficial.

Recommendation: As a region, evaluate the recyclability of PP in curbside and drop-off recycling and how the 'Widely Recyclable' designation of PP bottles, jugs, jars, and tubs impacts the region.

CUPS AND CARTONS

Recommendation: Develop a Task Force to address cup and carton recovery in the region. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties. Volumes, logistics, collection points, and marketing need to be analyzed to understand the true benefits and costs. This information will be key to working with potential industry partners on a transportation and end market solution.

Recommendation: Identify barriers to recycling paper cups within the region and seek to include these in acceptable recycling stream.

Recommendation: Develop a relationship with Foodservice Products Institute to seek out funding for promotional materials for foodservice products. Invite a representative from FPI to a MMAC meeting for discussion.

Recommendation: Evaluate the messaging around carton recycling and ensure that all recycling education includes cartons as recyclable in areas that have MRF acceptability. Include schools in messaging as high quantity generators of cartons.

Recommendation: Identify key stakeholders that generate cartons and partner with them for promotion. Schools are a primary target for this material. Carton Council of North America may offer support for outreach and resources for awareness.

Recommendation: Missaukee County Recycling Center can add cartons to their acceptable materials listing and create a new source of revenue, provide feedstock to a regional mill, and prevent cartons from being landfilled.

Recommendation: GFL can consider adding cups to its messaging, depending on market acceptance.

ORGANICS

Recommendation: Develop a Task Force to address organic material recovery in the region. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties. Volumes, logistics, collection points, and marketing need to be analyzed to understand the true benefits and costs. This information will be key to working with potential industry partners on a transportation and end market solution.

This will require a unique infrastructure that would support a hub and spoke model. Consider agricultural stakeholders (USDA-NRCS, Conservation District, Farm Bureau, etc.) who may be contributors of organic waste, have land available for compost processing, and be users of processed compost.

Recommendation: Work with community partners, like SEEDS, Emmet County, and Benzie County that are already engaged in organic waste management actively or as a partner, to identify sources of organic material and ways to promote organic material recovery to benefit the local environment and regional economy.

Recommendation: Review the case study in Appendix E to learn about how other communities are increasing access to food waste drop off programs.

Public/Private Partnerships

The benefits of public/private partnerships can be tremendous but finding the right partnership(s) and setting expectations of the relationship is important.

Recommendation: Identify high impact projects that are of interest to one or more counties in Networks Northwest and determine if a private sector partner could both bring benefit and realize benefit from the project. Discuss the project with NextCycle Michigan to determine eligibility for an Intergovernmental Initiatives and Public Private Partnership (I2P3) track to cultivate a partnership.

Recommendation: Evaluate the role of intergovernmental partnerships to jointly address the need for curbside recycling. These partnerships would still provide autonomy but more easily enables decision-making across political boundaries including standardization around certain collection and service approaches across the region, procurement approaches to lower costs, and funding mechanisms to assure quality services across the region.

Supportive Policy

Recommendation: Evaluate the gaps that are representative of the region and those of individual counties/cities and determine which policy/ies should be considered to fill the gap. Appendix B lists many policies and funding mechanisms for consideration. Example questions to ask to help determine which policies should be considered include:

- Are the needs based on funding to pay for services?
- Do we need more infrastructure to improve processing capacity?
- Is our weakness that we need more markets to build regional capacity?

Recommendation: If a policy is identified that would support materials management improvements, develop a plan to communicate the reason for the recommended policy and the benefit it would bring to county or municipal leadership.

Education & Outreach

Recommendation: Develop a Task Force to identify key messaging that can be used across the region, based on best practices for communication of materials recovery. This should allow you to work behind the scenes on focal areas that are of most importance to several of counties.

Recommendation: In partnership with haulers, MRFs, and mills, develop a consistent message and a toolkit that can support the positive messaging about recycling across the region. Identify the most important messages that carry across multiple counties and create a communication plan around them that can be adopted by each county.

Recommendation: Work with industry partners, like The Recycling Partnership, to create outreach materials that are developed using industry best practices and use them consistently.

Recommendation: Develop a portal or shared space for recycling coordinators to store resources that can be shared.

Regional Planning

Recommendation: Evaluate the role of intergovernmental partnerships to jointly address the materials management planning needs across the region. These partnerships would still provide autonomy but more easily enables decision-making across political boundaries including standardization around certain collection and service approaches across the region, procurement approaches to lower costs, and funding mechanisms to assure quality services across the region.

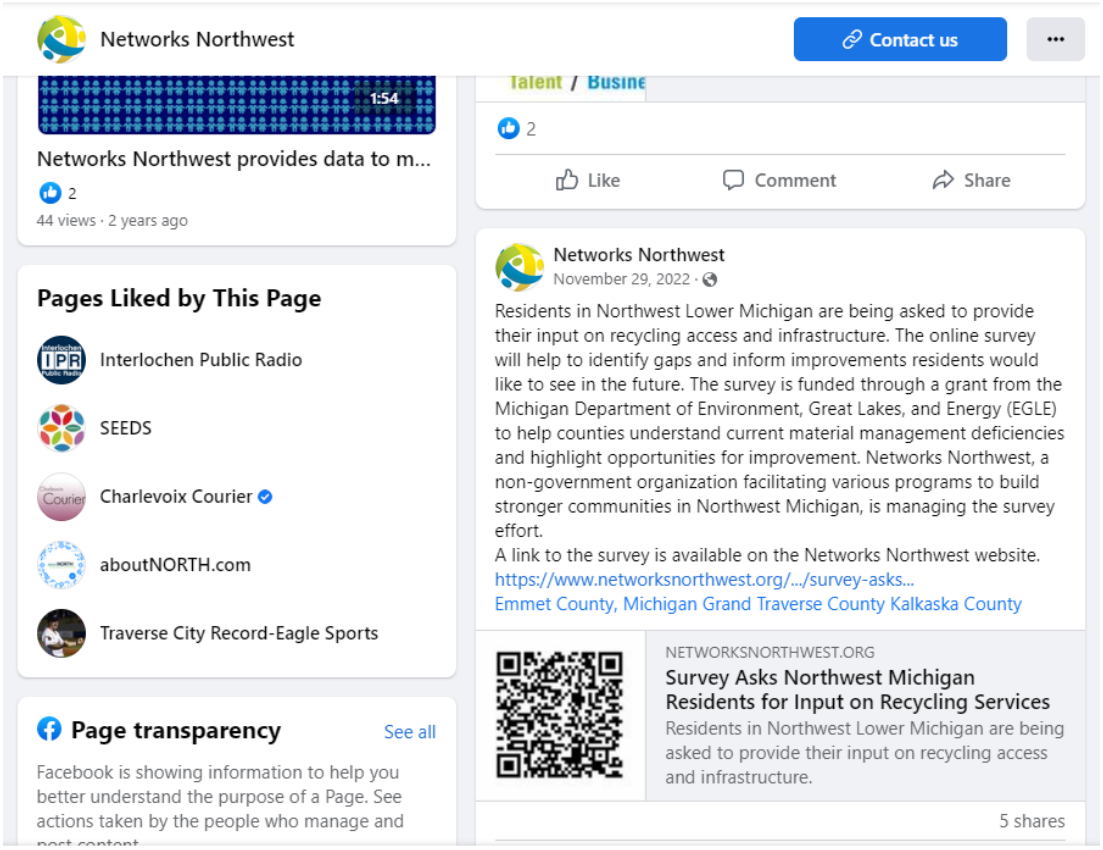
Recommendation: Evaluate the common needs across the region to determine where regional planning could support the planning effort. Where are the intersection points?

Recommendation: Determine which components of county planning should be isolated and which should be collaborative.

Recommendation: Discuss among the MMAC group the impact that removal of import/export agreements will have on the flow of waste across the region, particularly for those that have landfills in the county.

APPENDIX A: STAKEHOLDER FEEDBACK

SURVEY PROMOTION



Networks Northwest Facebook page post promoting the regional survey.

Social media graphic provided as optional promotional tool.

SURVEY PRESS RELEASE

SURVEY ASKS NORTHWEST MICHIGAN RESIDENTS FOR INPUT ON RECYCLING SERVICES

Residents can provide input on recycling services to inform improvements to sustainable materials management in the region.

November 28, 2022, Traverse City, Mich. – Residents in Northwest Lower Michigan are being asked to provide their input on recycling access and infrastructure. The online survey will help to identify gaps and inform improvements residents would like to see in the future.

The survey is funded through a grant from the Michigan Department of Environment, Great Lakes, and Energy (EGLE) to help counties understand current material management deficiencies and highlight opportunities for improvement. Networks Northwest, a non-government organization facilitating various programs to build stronger communities in Northwest Michigan, is managing the survey effort.

"As the state pivots from ensuring landfill capacity and toward increasing sustainable materials management, it is important to gather feedback from residents," stated Mathew Cooke, community planner with Networks Northwest. "Understanding the current recycling situation will help to identify the gaps that need to be filled to increase recycling and material recovery in Northwest Michigan."

The Northwest Michigan counties participating in the survey include Antrim, Benzie, Charlevoix, Emmet, Grand Traverse, Kalkaska, Leelanau, Manistee, Missaukee, and Wexford.

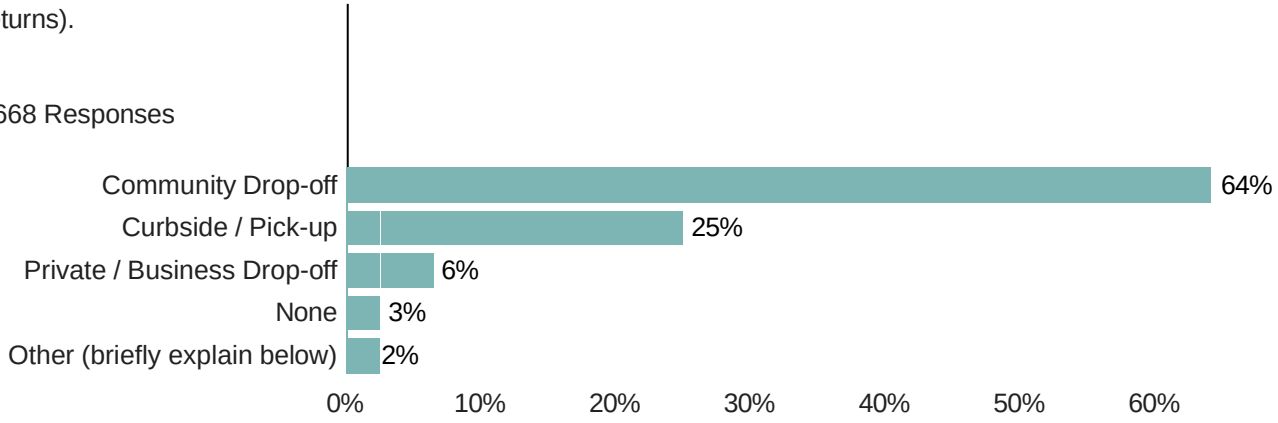
Residents are asked to complete the survey by December 22, 2022. Link to the survey via the QR code or URL:
https://resourcerecycling.co1.qualtrics.com/jfe/form/SV_3RkCnjt88HHCi7s

MMCE Networks Northwest Survey Results Summary (All Counties)

Q1 - What recycling services are available in your area? (select all that apply)

SUMMARY - Community Drop-off is the predominate recycling service type offered across the studied counties. Only a quarter of the counties offer Curbside Pick-up services and a handful offer other recycling services (such as, business drop-off, hazardous waste drop-off, seasonal community drop-off for specific items, and can & bottle returns).

1668 Responses



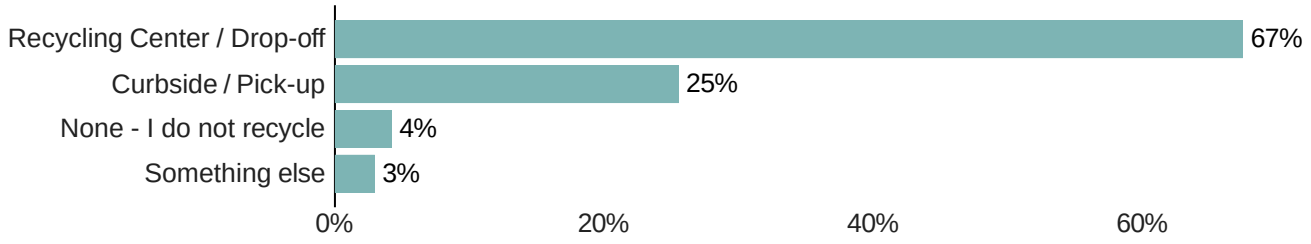
Q1 - "Other" text responses

42 Responses

Q2 - What type of recycling services do you most often use, not including bottle returns?

SUMMARY - Given the stated availability of recycling services, it is unsurprising that Drop-off services are most often used, followed by Curbside Pick-up services. There is an additional 1% of respondents beyond those without access to recycling who say that they do not recycle at all.

1668 Responses

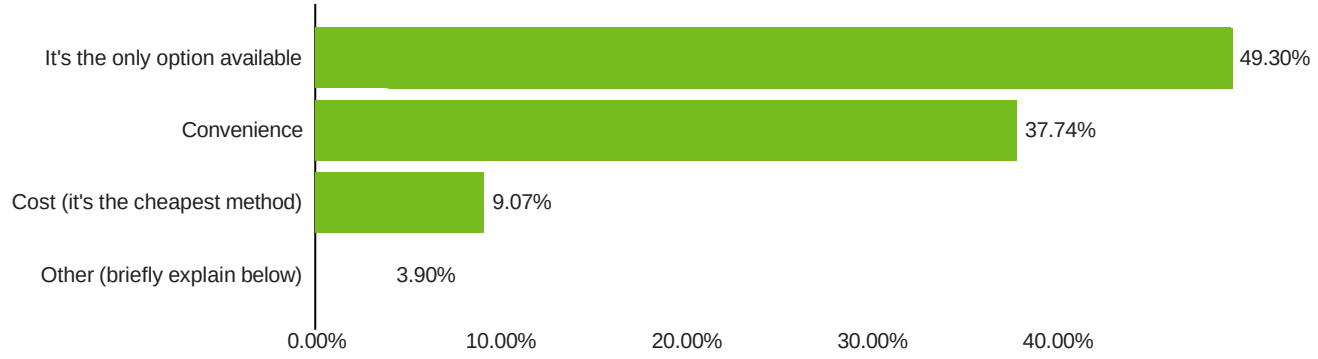


Q2 – “Other” text responses

Q3 - What is the most important reason you choose to recycle this way?

SUMMARY - When offered, residents strongly prefer Curbside Pick-up services over Drop-off for convenience sake. However, most only have the option to recycle via Drop-off.

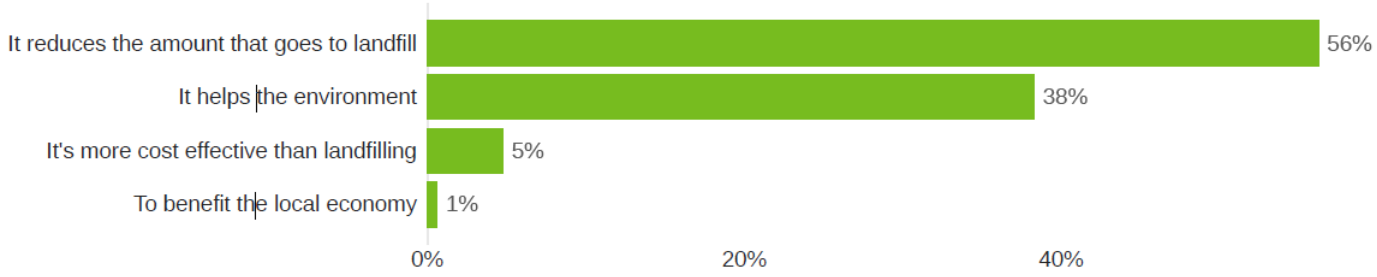
1566 Responses



Q4 - Why do you recycle?

SUMMARY - Very few recycle for economic reasons, instead, they associate recycling as reducing the amount of waste headed to landfills or as an environmentally sound decision.

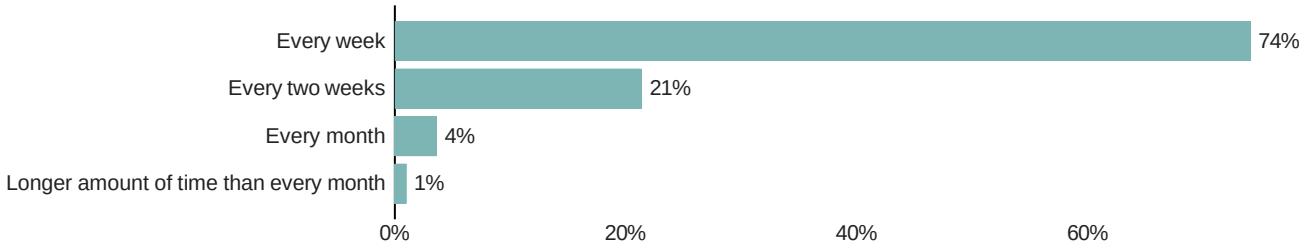
1566 Responses



Q5 - How often do you recycle using curbside / pick-up?

SUMMARY - Of those who are offered Curbside Pick-up services, three quarters use it every week.

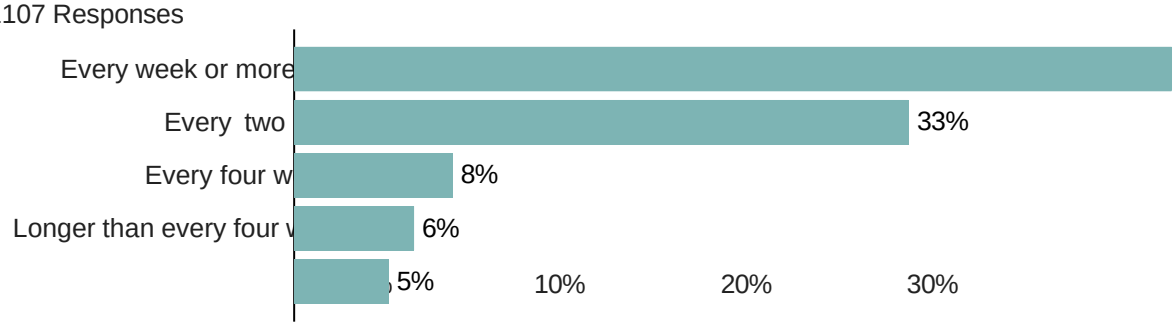
412 Responses



Q6 - How often do you recycle using a Recycling Center or drop-off?

SUMMARY - Those with access only to Drop-off recycling services to are most likely to use the service weekly. Otherwise, residents with other recycling services available use Drop-off recycling services less frequently, though every two weeks in not uncommon.

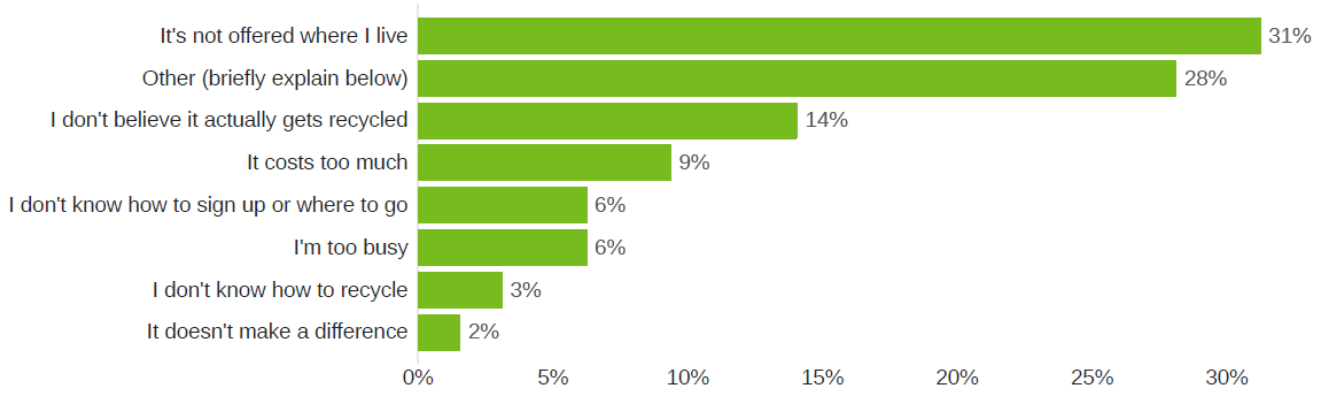
1107 Responses



Q7 - What is the most significant reason you do not recycle?

SUMMARY - No available recycling service is the leading reason that residents don't recycle. Following that, a number of respondents offered other explanations such as the recycling services offered being inconvenient and the community bins always full/rarely emptied. A handful of people expressed skepticism about the validity and worth of recycling.

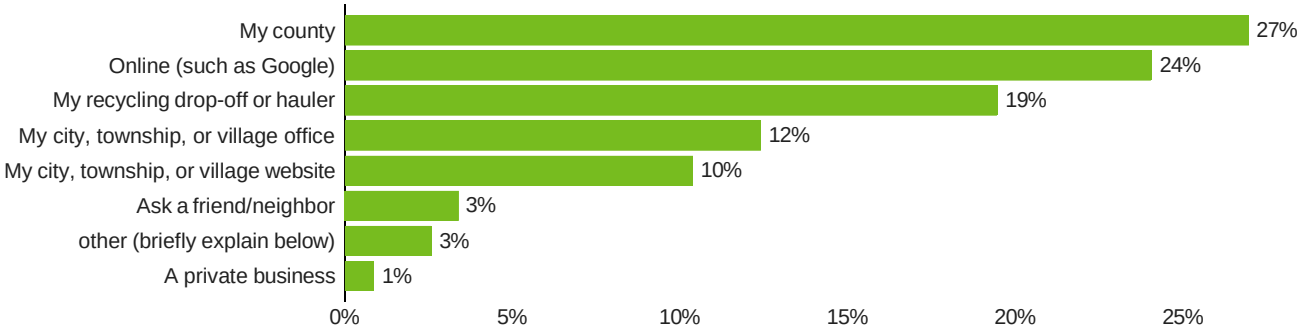
64 Responses



Q8 - If you had questions about recycling, where would you first seek out information?

SUMMARY - 68% first look towards their municipality and recycling providers to answer questions about recycling. While the other third seeks information from Google, friends, or private businesses.

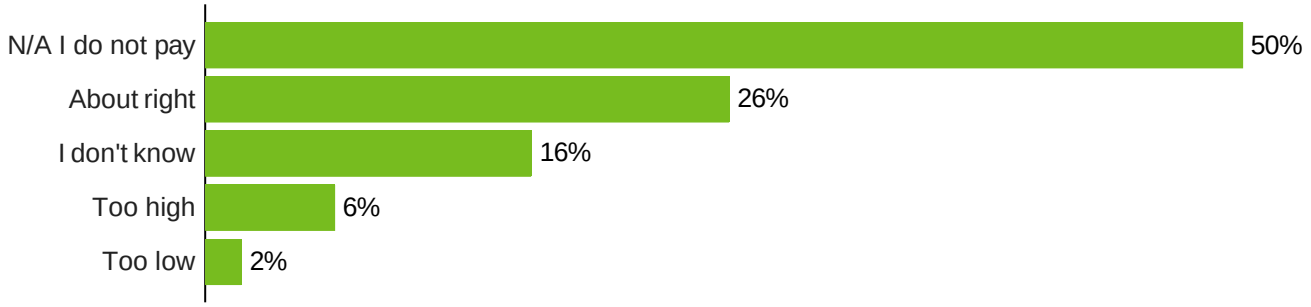
1630 Responses



Q9 - Do you think the cost of recycling is too high, about right or too low? Please respond even if you do not recycle.

SUMMARY - 50% do not pay for recycling, while a quarter thinks the price of recycling is about right. NOTE: One potential problem with this question, is that the survey did not capture whether the respondent knows if the cost of recycling is bundled into the cost of their trash pickup.

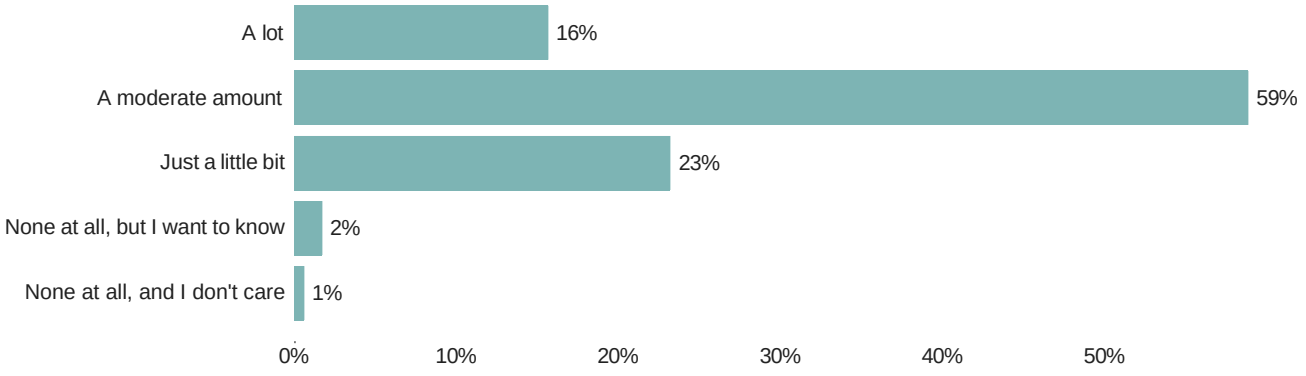
1630 Responses



Q10 - How much do you know about recycling, generally speaking?

SUMMARY - A majority feels they know a moderate amount about recycling. Whereas only 16% feels that they know a lot.

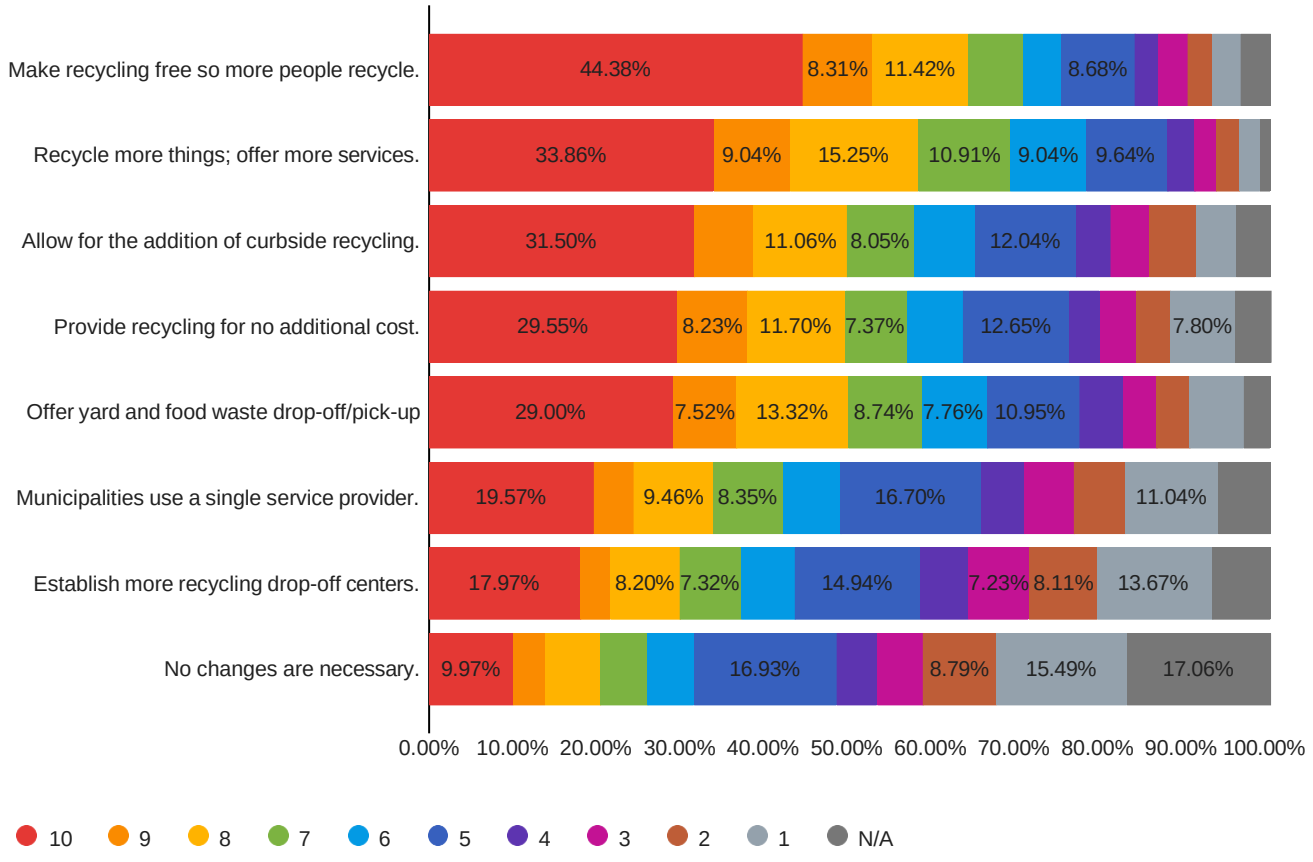
1630 Responses



Q11 - Leaders in Northwest Michigan are exploring ways to improve recycling and other waste management services offered to residents and businesses. On a scale of 1-10, with 10 being VERY IMPORTANT and 0 being NOT AT ALL IMPORTANT, how important are each of the following potential improvements to you? If you already have access to an option, select 'not applicable'

SUMMARY - Although residents who currently recycle feel that recycling costs either the right amount or little to nothing for them, they express an importance for recycling to be completely free to allow for greater accessibility and participation. As well, residents would like to see more recycling services to support the recovery of items not currently recycled in their areas.

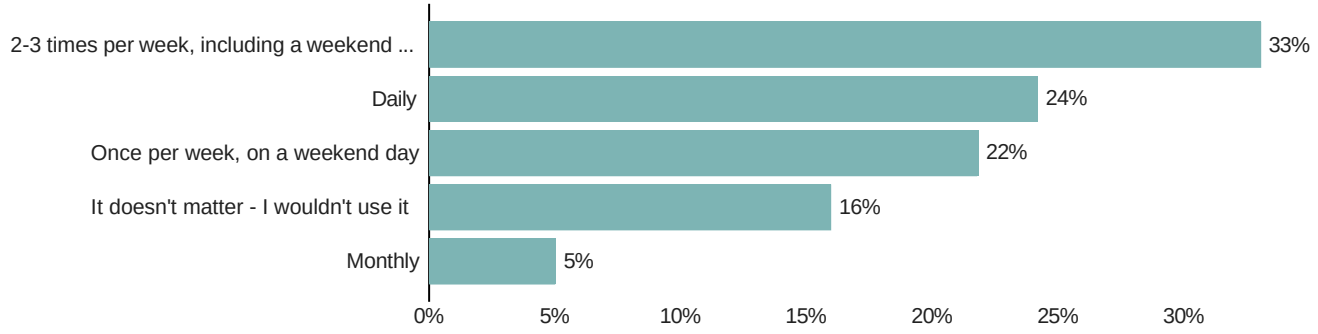
1465 Responses



Q12 - If a convenient recycling or food waste drop-off site were available close to where you live, how often would you want it open?

SUMMARY - 55% of people would like a Drop-off site open at least once per week on the weekend day. A quarter would like Drop-off sites open daily.

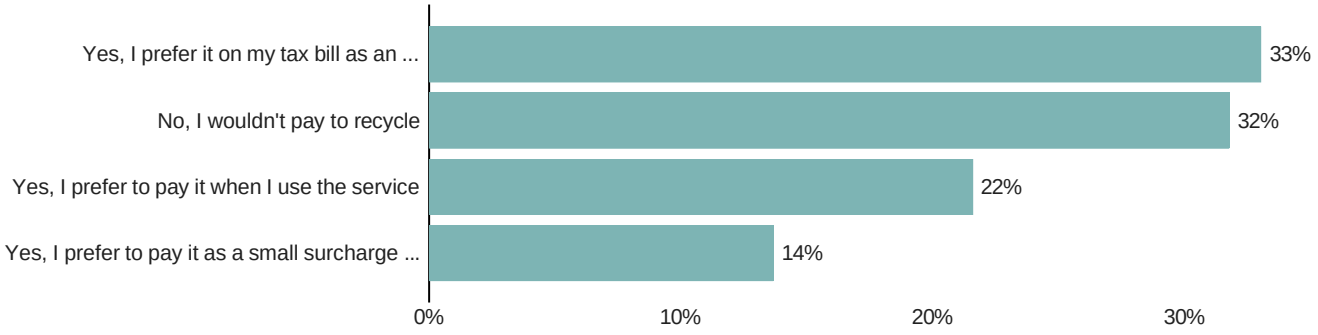
1472 Responses



Q13 - Would you be willing to pay a small fee to have convenient access to recycling or food waste collection?

SUMMARY - There is a near equal split between those who would prefer to pay for recycling or food waste collection through an assessment or fee on their tax bill and those who do not want to pay anything for recycling.

1513 Responses

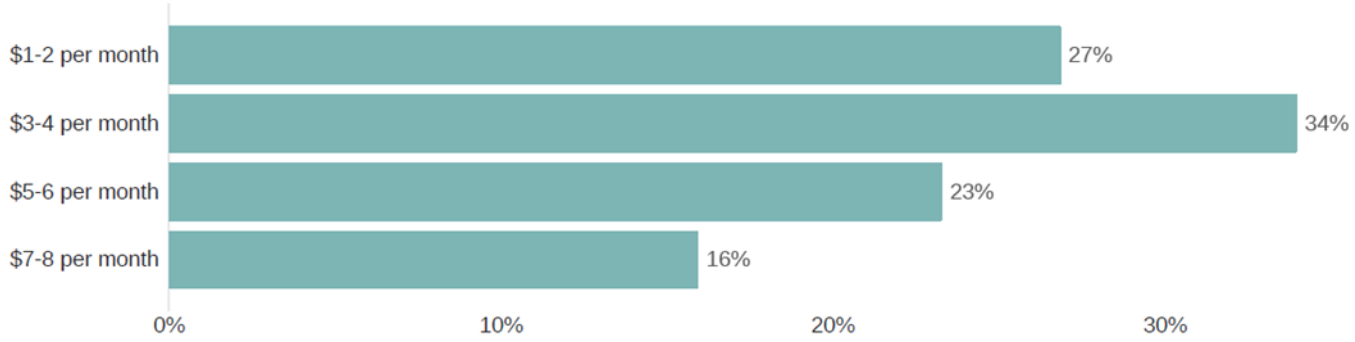


Q14 - What would you be willing to spend to get convenient access to recycling or food waste collection?

954 Responses

SUMMARY - A sizeable fraction of respondents (37%) would not pay anything for convenient access to recycling or food waste collection. Of those willing to pay for recycling or food waste collection, 84% want to pay $6 or less a month for recycling or food waste collection; $3-4 per month is most preferred.

Note: 37% of respondents would not pay anything.



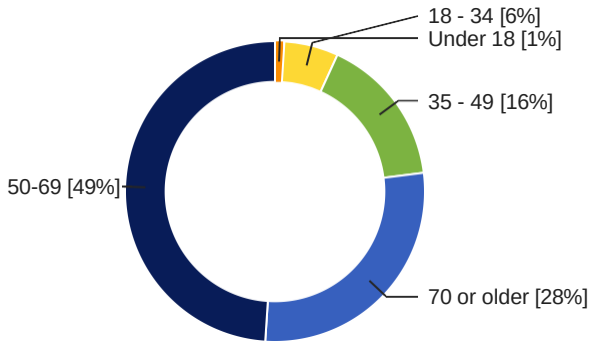
Demographics and Background of Respondents

Summary:

- Respondents are primarily 50 years of age or older.
- Respondents are predominately female.
- 91% have some college education or higher.
- 93% of respondents own the home that they live in.
- Most live in either Charlevoix, Grand Traverse, or Emmet County.
- Most live in their MI county year around.
- Unsurprisingly, because of the higher age range of our respondents, 82% do not have children living at home who are school age or younger.
- 94% of respondents are white with little representation of other racial or ethnic groups.
- Median yearly household income falls around $75,000 - $100,000 per year.
- Of those who rent or lease their home, a majority does not have on-site recycling available to them, but would like to have the option. Slightly over one-third have access to and use on-site recycling services.

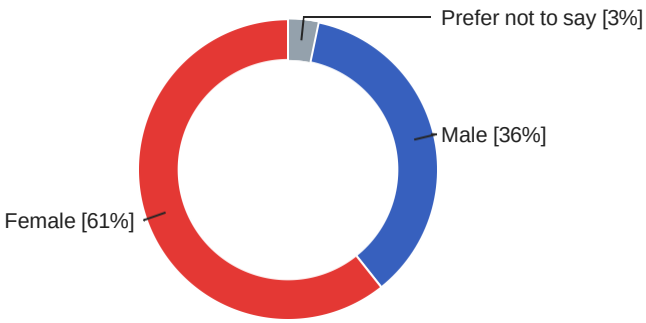
Q16 - Which of these best fits your age?

1491 Responses



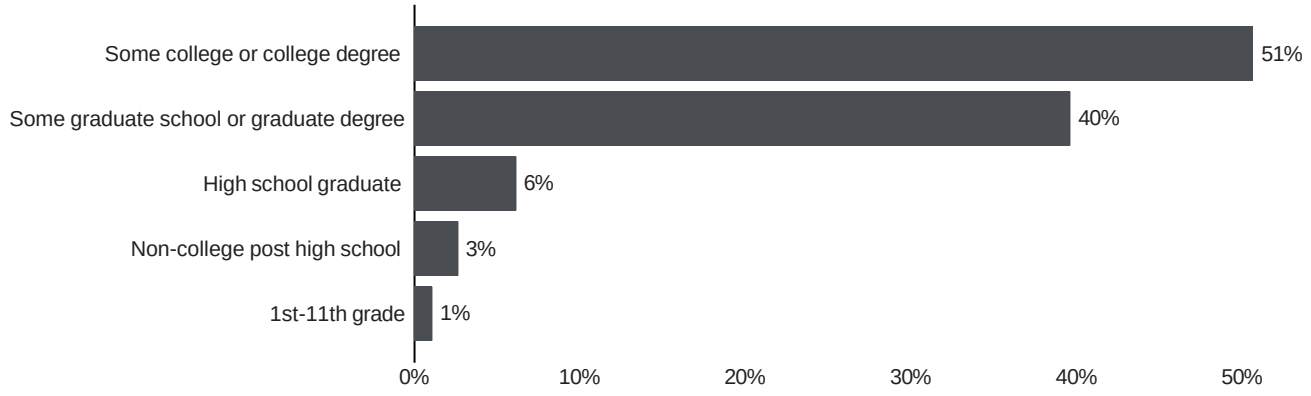
Q17 - What is your gender?

1491 Responses



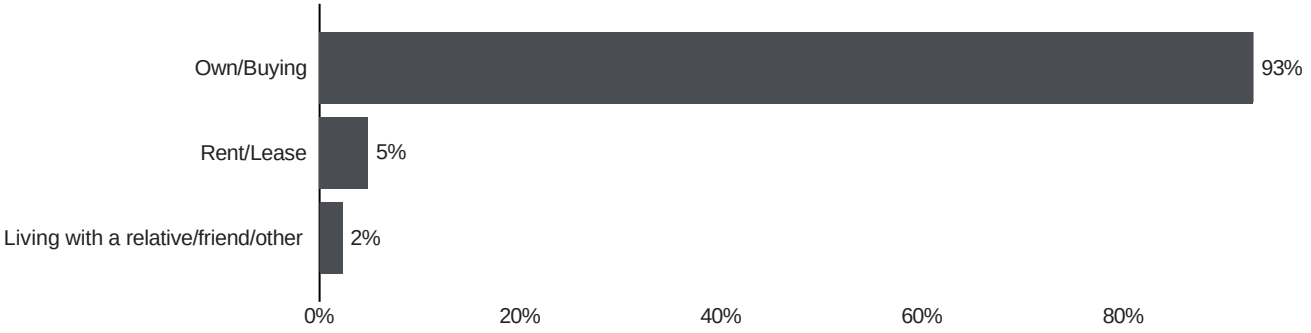
Q18 - What is the last grade or level of schooling you completed?

1491 Responses



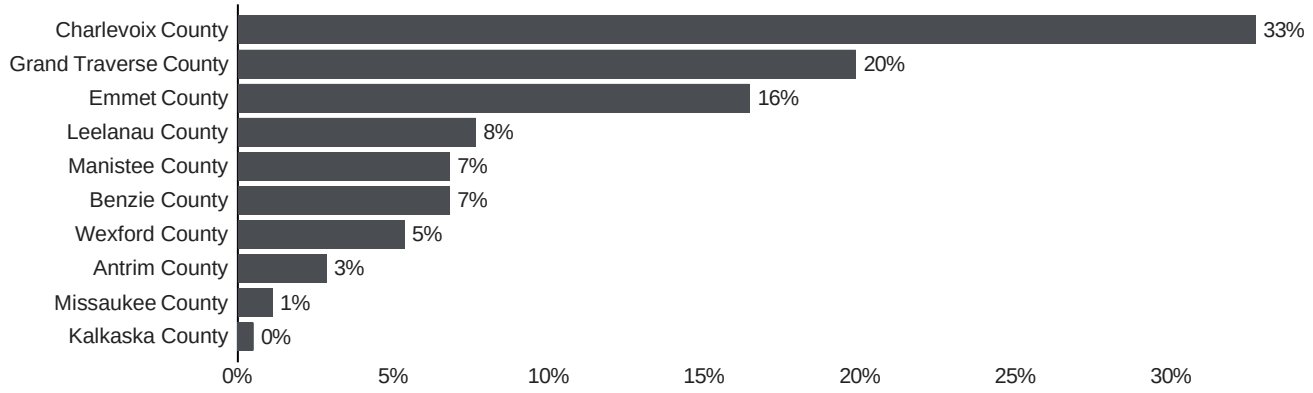
Q19 - Do you own your own home, are you buying a home, or do you lease or rent where you live?

1491 Responses



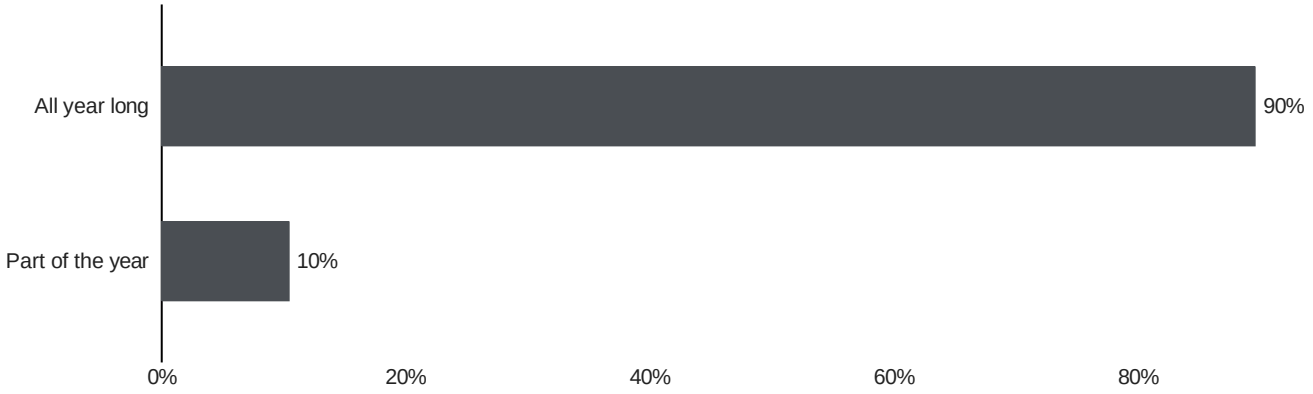
Q20 - County

1441 Responses



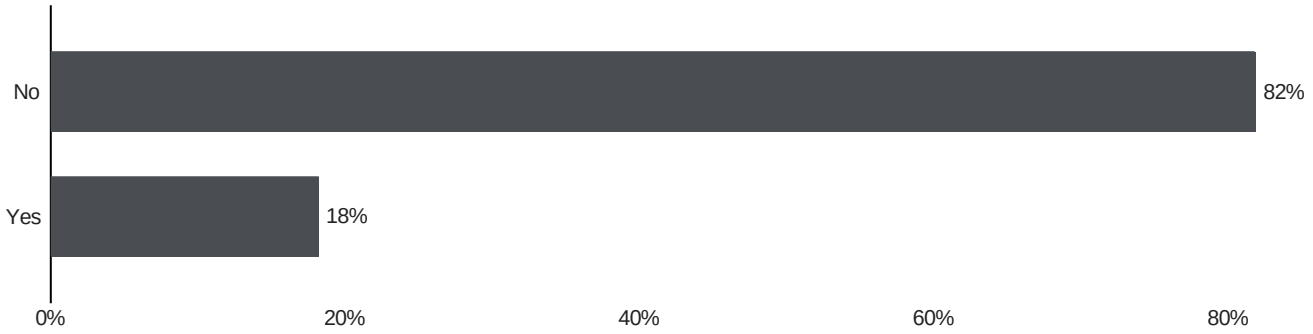
Q21 - How much of the year do you live in this county?

1441 Responses



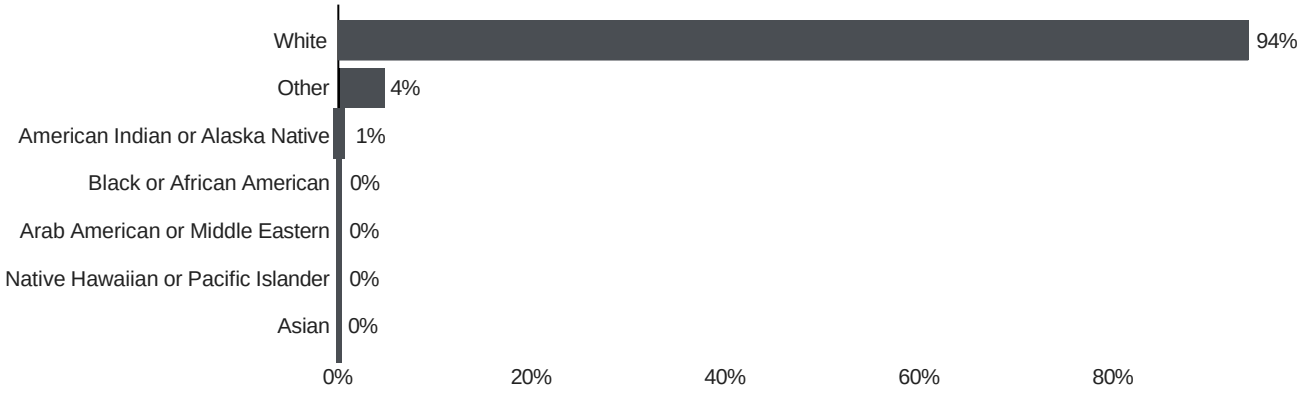
Q22 - Do you have children living in your home who are school age or younger?

1441 Responses



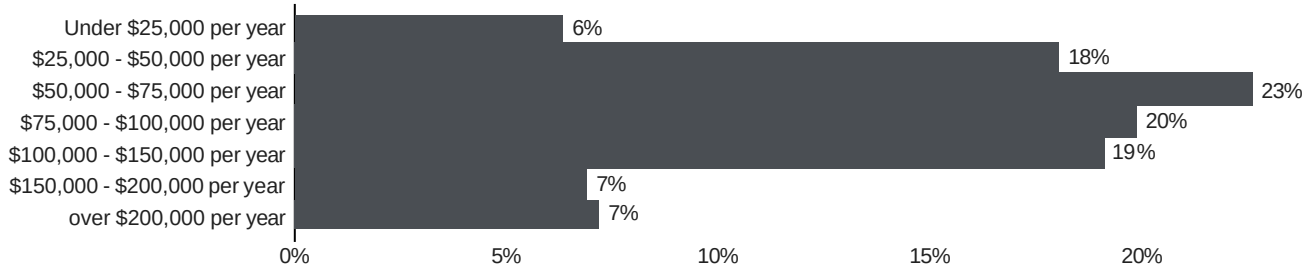
Q23 - Which racial or ethnic group best describes you?

1441 Responses



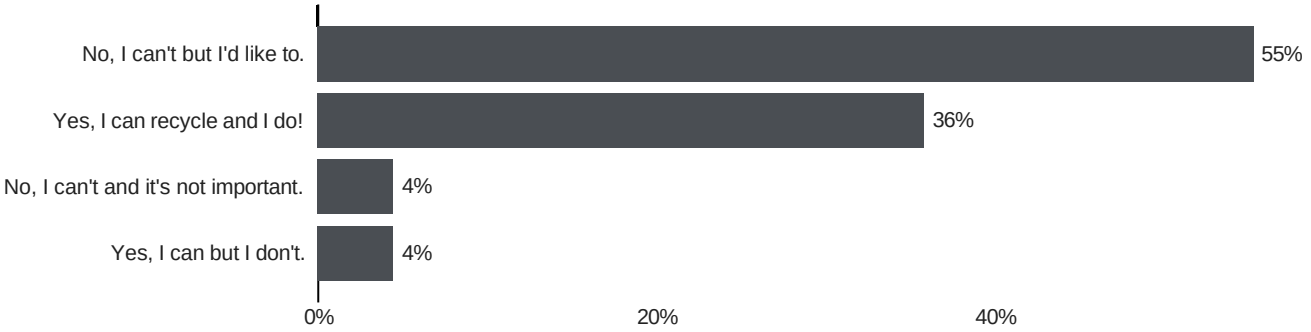
Q24 - In which of the following categories does your total yearly household income fall, including everyone in the household? If retired, please select an income category based on retirement income.

1420 Responses



Q27 - As a renter/lessee, do you have recycling available on the property where you live?

67 Responses



MUNICIPAL STAKEHOLDER FEEDBACK

Simple, open-ended questions were distributed via email to all municipal leaders for which contact information could be located. They were contacted twice during the period between November 29 and December 22.

1. How would you grade your county for recycling and other waste reduction initiatives that are in place? A, B, C, D, or failing. Please briefly explain why you think so.

2. Where could your county improve the programs, services, and infrastructure to help residents and businesses reduce what they send to landfill? Give specific examples of improvements you would like to see regarding policy that could support recycling and organic waste collections, services that could be added, access to recycling services improved, facilities that would enable more collection, partnerships that could be forged, participation that should be improved, or other related topics.

3. Is there anything else you'd like to tell us about specific county, city or township improvements regarding recycling and waste diversion that you would like to share? Do you have any recycling-related initiatives underway or in mind that we should know about during this project?

County	# of Responses	Grade	Highlights	Suggestions
Antrim	**8**	**B+**	• Recycling sites are generally well maintained • County coordinates HHW days many residents utilize • Communities provide clean up days for excess residential waste	• Trash disposal site & additional recycling sites • Recycling site monitoring • Public education campaign • Curbside compost and recycling programs
Benzie	**7**	**B**	• 24/7 drop-off recycling sites & 2-3 HHW collections per year • Cost-effective staffing • PA 69 funding support across county	• Single or preferred curbside hauler agreements • Additional recycling sites, bin collection frequency, and site monitoring • Permanent site or more collection events for HHW, bulky items, & organic waste
Charlevoix	**8**	**C+**	• Recycling sites are used frequently by residents and are generally well maintained • HHW events are well utilized	• More recycling sites needed (seasonally?) • Public education campaign • Expand curbside service availability, include multi-family • Coordinate business, school recycling • More outlets/events for batteries, tires, e-waste, and organics
Emmet	**5**	**A+**	• Curbside and drop-off recycling programs are well-structured and well-utilized	• Drop-off site in Petoskey • Textile recycling options • Public education campaign

			• Financial incentives to recycle • Committed staff and largely supportive political backing	
Leelanau	**2**	**B**	• Drop-off sites are well utilized • Residential support for household fee to fund programs • HHW and hard-to-recycle material collection events available annually for residents	• More recycling sites in less accessible or populated areas • Expand multi-family services and school recycling programs (use them as drop-sites?) • Develop multi-county composting program

Note: If a county is not listed here there was no feedback provided from municipal representatives from that county

APPENDIX B: NEW POLICY & FUNDING

Policy

SPECIAL ASSESSMENTS

Special assessments are charges against real property, such as land and structures, for an improvement or service that provides a benefit to those living in the special assessment district. They can be used by municipalities to fund projects or services that otherwise would not be possible, like road repairs, water and sewer mains, street lighting, police and fire protection, and garbage and recycling services. They can be used in conjunction with general fund revenues, service fees, user charges, grants, or other sources of funding.

Examples of special assessments that are commonly used to fund garbage and recycling collection and facilities include:

- Act 188 of 1954 – Township Public Improvement Act
- Act 116 of 1923 – Township and Village Public Improvement and Public Service Act
- Act 342 of 1939 – County Public Improvement Act of 1939
- Act 233 of 1955 – Municipal Sewage and Water Supply Systems
- Act 185 of 1957 – County Department of Public Works
- Act 69 of 2005 – County and local units
- Act 76 of 1965 – Joint Water Supply and Waste Disposal Systems

Public Act 138 authorizes counties, through resolution of their Boards of Commissioners, to collect a household fee or surcharge not to exceed $25 per household per year for waste reduction programs and the collection of source-separated materials for recycling and composting. This includes household hazardous waste, tires, batteries, yard waste, and recyclable materials. PA 138 is commonly used across Michigan to support a basic level of service to residents.

Public Act 69 expands the opportunities offered by PA138 by doubling the fee up to $50 and extends service offerings to businesses. The funding amount is up to $50 per business per year which may limit the ability of the county or local government from providing convenient access to some programs, such as regular collection of household hazardous waste, expanded recycling services for non-traditional materials, or community compost collection. For those counties that do not utilize any policy but desire to introduce basic programs with the assurance of funding, a special assessment, such as PA 69, could be considered as a first step. In developing a PA 69-based recycling program, steps can be taken in its design and scope that enable business and institutional generators to access the recycling services and contribute to the cost of providing those services.

ORDINANCES

Ordinances are pieces of legislation that can be enacted by a municipal authority, at the county, city, township, or village level to achieve the desired goals. In this way they become local law, carrying the same effect as a state statute within the jurisdiction's boundaries.

Waste-related ordinances at the local level commonly address blight and general property maintenance. Some communities take a broader approach to local ordinance to require specific actions of homeowners and/or service providers.

OTHER FUNDING MECHANISMS:

Landfill Surcharge
Counties that have a landfill within their boundaries can impose a surcharge of a specified amount on all solid waste coming into the landfill. The operator of the landfill must collect the surcharge and pay it to the county for the designated use.

Disposal Facility Surcharge
Counties that have their own disposal facilities that are not landfills can establish rates such that waste that passes through the facility is imposed a fee that supports the recycling programs.

Intergovernmental Agreements
Local units of government – with or without the support of the county – can use intergovernmental agreements to establish rules that place requirements on waste haulers to achieve certain recycling goals.

Hauler Licensing
Though not a significant source of revenue, many communities in Michigan elect to require waste haulers (and other similar service providers) to register. This registration allows them to better understand who is doing business in their community to be able to address issues that may arise. Additionally, hauler licensing can require tonnage reports to be submitted periodically. This valuable information allows community leaders to observe flows of waste inside and outside the jurisdictional boundaries to assist with planning efforts.

Dedicated Millage
Incorporated cities and charter townships are authorized by state statute to charge an additional millage for solid waste and recycling services. No public vote is required. Alternatively, any local unit of government or county can seek a vote of the people for a temporary or permanent millage to fund a solid waste or recycling program. City of Grand Rapids and Charlevoix County are among Michigan jurisdictions using this approach.

Fee
A household fee can be collected to fund a recycling program, if approved by voters.

Hauler Contracting
Municipalities and counties can opt for a single hauler, selected through a competitive bid process that occurs at regular intervals, that provides exclusive service to the designated jurisdiction(s). A single hauler contract generally providers lower rates for residents because of the assurance to the hauler that they have the entire route, creating great efficiency. Municipal leaders and residents generally appreciate not having multiple waste collection vehicles from different companies driving down local roads, as it reduces wear and tear on the road surface. However, some residents resent not having the ability to select the company they desire. Within Grand Traverse County, Acme and Peninsula Township have enacted local ordinances – 2011-01 and 2011-43, respectively, setting forth the requirements of how and when trash and recycling are to be collected under the township-wide ordinance.

FUNDING:

Grants listed here are for reference purposes only and may not currently be available.

STATE OF MICHIGAN

The FY 2024 state budget includes funding for community and economic development which may support some infrastructure improvements within individual counties or the region. Included is **$200 million for the Michigan Regional Empowerment Program**, a competitive grant program to implement transformative regional economic development projects and **$100 million for the Community Downtown Economic Development Program** (general fund) to support competitive grants for community development and placemaking efforts in downtown areas both large and small across the state. Grants will support community redevelopment, placemaking, housing and other infrastructure needs to spur growth and economic development in downtown commercial cores. [6]

EGLE Recycling Infrastructure Grants

Due May 19, EGLE is seeking infrastructure grants that achieve specific targets, including those that:

- increase collection and processing capacity of recyclable materials or food waste.
- increase access to recycling or food waste composting infrastructure.
- increase participation rates in recycling or food waste composting programs.

Projects could support the transition from recycling bins to carts, public space recycling containers, creation or enhancement of public drop-off recycling, new or improved recycling processing infrastructure, school recycling projects, collection vehicles, and multi- family recycling projects. Ineligible projects include household hazardous waste projects, electronic waste recycling projects, scrap tire recycling projects, and one-day collection events.

Eligible applicants are nonprofit organizations, tribal governments, school districts, universities/colleges, local health departments, regional planning agencies, cities, villages, townships, charter townships, counties, municipal solid waste authorities, and resource recovery authorities located in Michigan. Preference will be given to communities that face historic environmental or socio-economic disparities.

Total Recycling Infrastructure Grant funding amount is at least $3,300,000 and the range for each grant is $5,000 - $1,000,000 with a mandatory 20% match.

Link: www.Michigan.gov/MIRecycles

EGLE Small Community Education Grant

Available on an ongoing basis until all funds have been distributed, this grant seeks projects that will provide access to recycling education resources for small communities (fewer than 10,000 households.) The grant is accessed through an online platform where grantees can select and customize a variety of templates that will be printed and sent directly to residents. There is no match requirement for this grant opportunity. All outreach costs are included – design, printing, and mailing. Material options include info postcards, top issue postcards, magnet postcards, information sheets, cart tags, and dumpster signage, which can be customized with a local logo, website, and phone number and are provided in a bilingual format (English and Spanish).

---

[6] Executive Budget, FY 2024 Issued 2/8/23 https://www.michigan.gov/budget/-/media/Project/Websites/budget/Fiscal/Executive-Budget/Current-Exec-Rec/FY-2024-Budget-Book_FINAL_2-8-23.pdf?rev=88d0722031504d3e863ee8e7ba5195e6&hash=4FF9CFD6BEB257C8E15C0AA4258C22DC

Eligible applicants are nonprofit organizations, tribal governments, school districts, universities/colleges, local health departments, regional planning agencies, cities, villages, townships, charter townships, counties, municipal solid waste authorities, and resource recovery authorities located in Michigan. Preference will be given to communities that face historic environmental or socio-economic disparities.
Link: *www.Michigan.gov/MIRecycles*

EGLE Scrap Tire Collection and Market Development Grant
Available in the fall each year, tire grants fund two distinct areas of tire recovery. For local governments, funding is available for tire collection events (short term or long term) to ensure scrap tires don't become nuisances that will attract mosquitoes or fire risks. A second focus for tire grants is market development. Private businesses and government entities are eligible for these grants that seek to find new uses for scrap tires.
Link: https://www.michigan.gov/egle/newsroom/press-releases/2022/05/10/electronics-recycling-grants

EGLE Rural Electronics Recycling Grant
This grant opportunity will support increased access to proper electronics recycling in the rural areas of the state. Grants can be used to support improvements to current collection facilities; support electronics recycling events leading up to the establishment of new permanent collection locations; support the collection, handling and proper recycling of consumer electronics; provide education to residents on the proper collection, handling and recycling of household batteries; and upgrade operations to provide increased efficiency at registered electronics recyclers.

FEDERAL GOVERNMENT

US Environmental Protection Agency:

EPA Solid Waste Infrastructure for Recycling Grant Program for political subdivisions funding can be used for three categories of activities:

- Establish, increase, expand, or optimize collection and improve materials management infrastructure. Fund the creation and construction of tangible infrastructure, technology, or other improvements to reduce contamination in the recycled materials stream.

- Establish, increase, expand, or optimize capacity for materials management.
- Establish, improve, expand, or optimize end-markets for the use of recycled commodities. Demonstrate a significant and measurable increase in the diversion, recycling rate, and quality of materials collected for municipal solid waste.

Materials and waste streams within scope of this grant program include municipal solid waste, including plastics, organics, paper, metal, glass, and construction and demolition debris. This also includes the management pathways of source reduction, reuse, sending materials to material recovery facilities, composting, and industrial uses (e.g., rendering, anaerobic digestion), and feeding animals.

Applications may include (but are not limited to) projects that fund:

- Innovative solutions and/or programs that provide or increase access to prevention, reuse, and recycling in areas that currently do not have access; including development of and/or upgrades to drop-off and transfer stations (including but not limited to a hub-and-spoke model in rural communities), etc. The purchase of recycling equipment, including but not limited to sorting equipment, waste metering, trucks, processing facilities, etc.

- Upgrades to material recovery facilities (MRFs) such as optical sorters, artificial intelligence, etc. Development of and/or upgrades to composting facilities or anaerobic digesters to increase capacity for organics recycling.
- Development of and/or upgrades to curbside collection programs or drop-off stations for organics. Development of and/or upgrades to reuse infrastructure such as online reuse platforms, community repair spaces, technology and equipment to improve materials management reuse options, food donation, and upcycling, staging areas for material reuse/donation, reuse warehouses, and reuse centers, and electronic waste and computer recycling and refurbishing.

Link: https://www.epa.gov/infrastructure/solid-waste-infrastructure-recycling-grant-program

EPA Recycling Education and Outreach Grant Program is funded from the Bipartisan Infrastructure Law and provides $75 million total from Fiscal Year 2022 to Fiscal Year 2026. All projects must encourage the collection of recyclable materials and must achieve one or more of the following objectives:

- Inform the public about residential or community recycling programs.
- Provide information about the recycled materials that are accepted as part of a residential or community recycling program that provides for the separate collection of residential solid waste from recycled material.
- Increase collection rates and decrease contamination in residential and community recycling programs.

for grants to fund projects
The Law also requires EPA to develop a model recycling program toolkit. This toolkit can be used by grant applicants to help design or improve recycling, composting, and other material management programs.
Link: https://www.eda.gov/oie/buildtoscale/

US Department of Agriculture:

USDA Community Facilities Direct Loan & Grant Program provides affordable funding to develop essential community facilities in rural areas. An essential community facility is defined as a facility that provides an essential service to the local community for the orderly development of the community in a primarily rural area, and does not include private, commercial, or business undertakings. Funds can be used to purchase, construct, and/or improve essential community facilities, to purchase equipment, and to pay related project expenses.
Funding is available in the form of low interest direct loans, grants, or a combination of the two, as well as a loan guarantee program. These may be combined with commercial financing to finance one project if all eligibility and feasibility requirements are met. Priority funding is based on population, median household income: small communities with a population of 5,500 or less and/or low-income communities having a median household income below 80% of the state nonmetropolitan median household income.
Link: https://www.rd.usda.gov/sites/default/files/fact-sheet/508_RD_FS_RHS_CFDirect.pdf

USDA Water & Waste Disposal Loan & Grant Program provides funding for clean and reliable drinking water systems, sanitary sewage disposal, sanitary solid waste disposal, and storm water drainage to households and businesses in eligible rural areas. This program assists qualified applicants who are not otherwise able to obtain commercial credit on reasonable terms. Eligible applicants include: most state and local governmental entities, private nonprofits, federally recognized tribes. Areas that may be served include rural areas and towns with populations 10,000 or less, tribal lands in rural areas, and colonias.
Funds may be used to finance the acquisition, construction, or improvement of solid waste collection, disposal, and closure, legal and engineering fees, land acquisition, water and land rights, permits, and equipment, and start-up operations and maintenance, interest incurred during construction, purchase of facilities to improve service or prevent loss of service, or other costs determined to be necessary for completion of the project.
Link: https://www.rd.usda.gov/sites/default/files/fact-sheet/508_RD__FS_RUS_WEPDirect.pdf

USDA Water & Waste Disposal Technical Assistance & Training Grants help qualified, private nonprofits provide technical assistance and training to identify and evaluate solutions to water and waste problems; helps applicants prepare applications for water and waste disposal loans/grants; and helps associations improve the operation and maintenance of water and waste facilities in eligible rural areas.
Nonprofits that have the proven ability, background, experience, and capacity to provide technical assistance or training on a national, regional or state basis may apply during the application window, from October 1 – December 31 each year. Eligible areas include rural areas and towns with populations of 10,000 or less and tribal lands in rural areas. Funds may be used to identify and evaluate solutions to water problems related to source, storage, treatment, distribution, collection, treatment, and disposal; to provide technical assistance and training to improve management, operations and maintenance of water and waste disposal systems; to prepare water and waste disposal loan and grant applications.
Link: https://www.rd.usda.gov/programs-services/water-environmental-programs/water-waste-disposal-technical-assistance-training-grants

USDA Solid Waste Management Grants reduce or eliminate pollution of water resources by providing funding for organizations that provide technical assistance or training to improve the planning and management of solid waste sites.
Applicants can include public bodies, nonprofits, federally recognized tribes, or academic institutions in rural areas and towns with a population of 10,000 or less. Special consideration may be given for projects serving an area with fewer than 5,500 or fewer than 2,500 people; regional, multi-state or national areas; or lower-income populations. The application window is open from October 1 through December 31 each year.
Link: https://www.rd.usda.gov/programs-services/water-environmental-programs/solid-waste-management-grants

USDA Strategic Economic and Community Development funding is authorized through a Farm Bill provision that supports regional economic and community development planning. SECD supports projects that promote and implement strategic community investment plans. These plans use the unique strengths of rural communities to advance prosperity. USDA Rural Development helps finance these projects to build community prosperity by using community assets, identifying resources, convening partners and leveraging federal, state, local or private funding.

US Economic Development Administration
EDA's Office of Innovation and Entrepreneurship (OIE) leads the **Build to Scale (B2S) program**, which is authorized under Section 27 of the Stevenson-Wydler Technology Innovation Act of 1980 (15 U.S.C. § 3722). Under the Build to Scale program, EDA manages a portfolio of national grant competitions that further increase the capacities of regions to plan and implement ecosystems that support innovators, entrepreneurs, and startups that are growing technology-driven businesses, creating high-skill, high-wage jobs, and building the industries of the future.

OTHER

Carton Council of North America
Carton Council of North America, Inc. (CCNA) will make grants available to partnering communities and MRF's in Michigan to increase recycling access and recovery of gable top and aseptic food and beverage cartons. CCNA will work with grant recipients to make successful and sustainable program changes to create a reliable supply chain for carton recycling end markets including Michigan based Great Lakes Tissue. CCNA will select grant recipients, complete all due diligence, develop, and oversee the contracting structure, and monitor the project for compliance over a minimum of a 3 year period. This will include all required reporting on the EGLE matching grant funds deployed to these community and MRF partners on a 1 to 1 basis.
Link:

NextCycle Michigan
NextCycle Michigan is designed to connect entrepreneurs, companies, organizations, and communities to technical support, financial resources, and capacity building for recycling, recovery, and reuse initiatives. NextCycle Michigan has a variety of pathways to advance recycling, recovery, and reuse initiatives in the state through its Innovation Challenges, traditional grants, data, and partner connections.
Through five 'tracks' NextCycle offers technical expertise and business development support to connect ideas in various stages of 'readiness' to opportunities for growth:

- RIT – new innovations and technology
- ROADS – expanding use of recycled content in road and path construction
- FLOWS – organics solutions
- I2P3 – public sector, collaborative solutions
- RSC – recycling supply chain solutions

Link: https://nextcyclemichigan.com/

Closed Loop Partners / NextCycle Partnership
Closed Loop desires to make below-market rate loans to companies doing business in the State of Michigan identified by the NextCycle Initiative and/or zero (0%) interest loans to municipalities in State of Michigan of up to US $5,000,000 per financing.

Specifically, the pledge over the next three-year period through 2024 is as follows: Closed Loop may provide capital in the form of below market rate debt, catalytic debt, and equity over the next three years in projects identified by the NextCycle Initiative that align with the Closed Loop investment goals. Closed Loop will be responsible for completing all due diligence, developing, and overseeing the financing structure, and monitoring it for compliance over the finance term.

Closed Loop will engage in supportive communication campaigns with these targeted investment recipients, and the communities they serve to announce the entrepreneurial projects focused on Recycling Infrastructure and Technology and Recycling Supply Chain innovations and will align the pro-recycling messaging of those campaigns with those outreach and messaging campaigns deployed by the State and NextCycle Michigan. We will look to NextCycle to include Closed Loop's goals and commitments in outreach, traditional media, social media and messaging campaigns.

Closed Loop will engage in supportive technical assistance on best practices for recycling as it undertakes the above activities, bringing expertise in recycling infrastructure development to support the growth of Michigan's circular economy and will participate in Technical Advisory Committee activities.

Closed Loop Partners CLP County MRF Improvement Loans

The Closed Loop Infrastructure Fund accepts applications for U.S.-based projects on a rolling basis and provides below-market rate loans to municipalities and companies to improve recycling infrastructure.

- Capital: Offering flexible and risk-tolerant capital through a number of different funding vehicles and capital structures, taking a long-term perspective on building resilient circular supply chains.
- Expertise: Leveraging their team's industry knowledge with research and solutions practice through the firm's Center for the Circular Economy to accelerate the flow of capital from co-investors, which in turn helps borrowers diversify their funding sources and supports their growth.
- Network: Based on an ecosystem that connects entrepreneurs, industry experts, global consumer goods and technology companies, retailers, foundations, financial institutions and municipalities, borrowers get exposure to this network, cultivating synergies and facilitating potential partnerships that can help scale businesses, for example through feedstock or offtake relationships, among other things.

CLP funds replicable, scalable, and financially sustainable recycling infrastructure and innovation projects in the U.S. across five primary categories:- Collection: New or expanded collection systems for household recyclables

- Sortation: New or expanded material recovery facilities that capture household recyclables
- Processing or Reclamation: New or expanded facilities that intake separated materials and use mechanical, chemical, thermal or biological means to prepare the recycled materials into raw materials
- End Product Manufacturing: The production of products or packaging that use recycled materials
- Enabling Technologies: Innovations that link nodes of the circular economy supply chain together, enhance the capability of processes to accept or incorporate recycled materials

Foodservice Packaging Institute

The Foodservice Packaging Institute (FPI) will provide grants to partnering communities and MRFs in Michigan to increase recycling access and recovery of targeted foodservice packaging items (FSP) - paper and plastic cups, containers and boxes, and paper bags. FPI will work with grant recipients to make successful and sustainable program changes - providing them with tools, resources, and best practices to create a reliable supply chain for end markets sourcing these materials. FPI will select grant recipients, complete all due diligence, develop, and oversee the contracting structure, and monitor the project for compliance over a minimum of a 3-year period. This will include all required reporting on the EGLE matching grant funds deployed to these community and MRF partners on a 1 to 1 basis.

Link: https://fpi.org/

Foam Recycling Coalition

In 2014, the Foam Recycling Coalition (FRC) was launched to support increased recycling of foodservice packaging made from foam polystyrene. In order to meet this objective, the FRC shares general information on foam recycling, provides technical resources and offers funding assistance to programs ready to start or strengthen post-consumer foam recycling. In addition to encouraging the recycling of foam foodservice packaging (i.e. cups, plates, bowls, clamshells and cafeteria trays), the efforts of the FRC also extend to other foam food packaging like egg cartons and meat trays.

Public and private entities in the U.S. and/or Canada that engage in any of the following activities are eligible to apply for the FRC grant:

- Operate a material recovery facility
- Manage residential curbside recycling programs
- Manage drop-off or convenience site recycling programs

Funding Source: Funding for the grant program comes from contributions from members of the Foam Recycling Coalition, a special interest group of the Foodservice Packaging Institute. Funding amounts will be made on a case-by-case basis and will be dependent on equipment needs. The maximum amount per grant is $50,000. No cash match is required, but additional costs by the grantee may be incurred for related items such as site preparation, provision of conveying system and electrical infrastructure, freight, and other installation costs.
Link: www.recyclefoam.org/grants

Glass Recycling Foundation
The Glass Recycling Foundation's grant program is intended to increase glass recovery and diversion from landfills, and to connect glass generators with end-markets. Eligible grantees are nonprofil entities; municipal, county, city, and state governments; glass collectors, MRFs, beneficiators, and manufacturers.
The two categories of projects allowed under the grant program are demonstration/pilot projects and education.

1. Demonstration/pilot projects should address specific gaps in the glass recycling supply chain and provide alternative strategies strengthening glass end markets.
   Examples of Potential Projects:
   - Equipment for Cleaning Recycled Glass
   - Collection Containers for Glass Drop-offs
   - Setting up Regional Strategies for Building Collection & Storage Infrastructure for Recycled Glass

2. Education projects need to present a clear message and strategy for educating the public about the environmental and community benefits of recycling glass and improving the quality of diverted materials from residents.
   Examples of Potential Projects
   - Developing and presenting trainings about more effective glass collection and recycling practices
   - Writing and disseminating case studies and guidance documents about the best management practices for effective glass collection and recycling practices
   - Developing signage for residential glass recycling drop offs
   - Developing and disseminating ads and announcements about glass recycling

Link: www.glassrecyclingfoundation.org/grants

APPENDIX C: COUNTY-LEVEL AGREEMENTS & ORDINANCES IN USE

ANTRIM COUNTY
Recycling Millage supports recycling drop off locations and HHW collection.

BENZIE COUNTY
Benzie County has implemented PA 69 to support funding and administration of recycling drop off and HHW collection.

CHARLEVOIX COUNTY
Recycling Millage

The recycling millage supports the county-wide recycling program, which includes drop-off sites located in Charlevoix, Boyne City, East Jordan, Beaver Island, Boyne Valley Township and Melrose Township. The program also offers other special services including annual household hazardous waste drop off days and tire collection events. The county levies 0.15 mill for recycling millage for four years (renewed in 2020). The electors previously approved a similar millage in 2016, which expired in 2019. If approved and levied in its entirety, it is estimated that the 0.15 mill would raise an estimated $332,014 for the county when first levied in 2020.

EMMET COUNTY
Ordinance No. 11-04, the Emmet County Solid Waste Ordinance
RE: flow control and pay-as-you-throw

The Emmet County Solid Waste Ordinance requires waste haulers to be licensed by the county. In being licensed, the haulers contractually agree to comply with the Ordinance.
A key provision of the Ordinance—a "flow control" provision—requires that waste haulers use the County Transfer Station. This serves to preserve competition by leveling the disposal cost "playing field" for the various waste haulers – local, regional, national, and multinational companies; those who earn thousands and those who earn billions; those who own landfills and those who do not. It also helps provide stable funding for the County's Recycling and Household Hazardous Waste programs. See "Funding," below.
The ordinance also contains a "Pay-As-You-Throw" provision (PAYT) specifying that waste disposal fees must be based on volume (i.e. per bag, cart, or yard) rather than at a flat rate (i.e. a flat monthly rate covering any amount set out). Under PAYT each household or business takes responsibility for the amount of waste they generate: if they generate less garbage they save money, if they generate more garbage they pay proportionately more. The United States Environmental Protection Agency recommends Pay-As-You-Throw as the best mechanism to reduce municipal solid waste. (*https://www.emmetrecycling.org/about-us/our-model#ordinance*)

GRAND TRAVERSE COUNTY

Ordinance No. 10: Grand Traverse County Solid Waste Alternatives Project Ordinance
RE: the provision of curbside recycling

Single family residential structures and multi-family residential structures with 4 or less units per building located inside the designated curbside recycling district or outside shall have access to curbside refuse, recycling, and yard waste collection services. Residents located in the curbside recycling district living in single family residential structures and multi-family residential structures with 4 or less units per building who subscribe to regular trash collection services are eligible for curbside recycling at no additional cost. Yard waste collection is available at an additional cost.

KALKASKA COUNTY

A recycling millage supports recycling drop off locations and HHW collection.

LEELANAU COUNTY

Leelanau County Solid Waste Ordinance enables the implementation of the Leelanau County Solid Waste Management Plan. The cost of developing, implementing, administrating, and enforcing the (Solid Waste Management) Plan and this Ordinance will be financed from the fees and fines provided for under this Ordinance. The fee schedule shall be established so as to adequately provide for such activities. The County Board of Commissioners will review the fee schedule at least annually and adjust the fees to provide for the budgetary needs for implementation, administration, and enforcement of the Plan and this Ordinance. The fee schedule will be a separate document, attached to this Ordinance. All fees will be collected through a payment program and deposited in a segregated fund to be used exclusively for purposes of funding the implementation, administration, and enforcement of the Plan and this Ordinance. The fee schedule may be amended by resolution of the Leelanau County Board of Commissioners and shall take effect when notice of the adoption of the amendment is published in a newspaper of general circulation in the county. A fee will be imposed on each cubic yard, as measured at the gate of the landfill or transfer station, as outlined in the attached fee schedule, unless otherwise exempt from the requirements of this Ordinance. The county surcharge for waste which is disposed of in a licensed landfill or passes through a transfer station in Leelanau County shall be collected by the landfill operator or transfer station operation.

Leelanau County has implemented PA 69 to support funding and administration of recycling drop off and HHW collection.

MANISTEE COUNTY

Manistee County has implemented PA 69 to support funding and administration of recycling drop off and HHW collection.

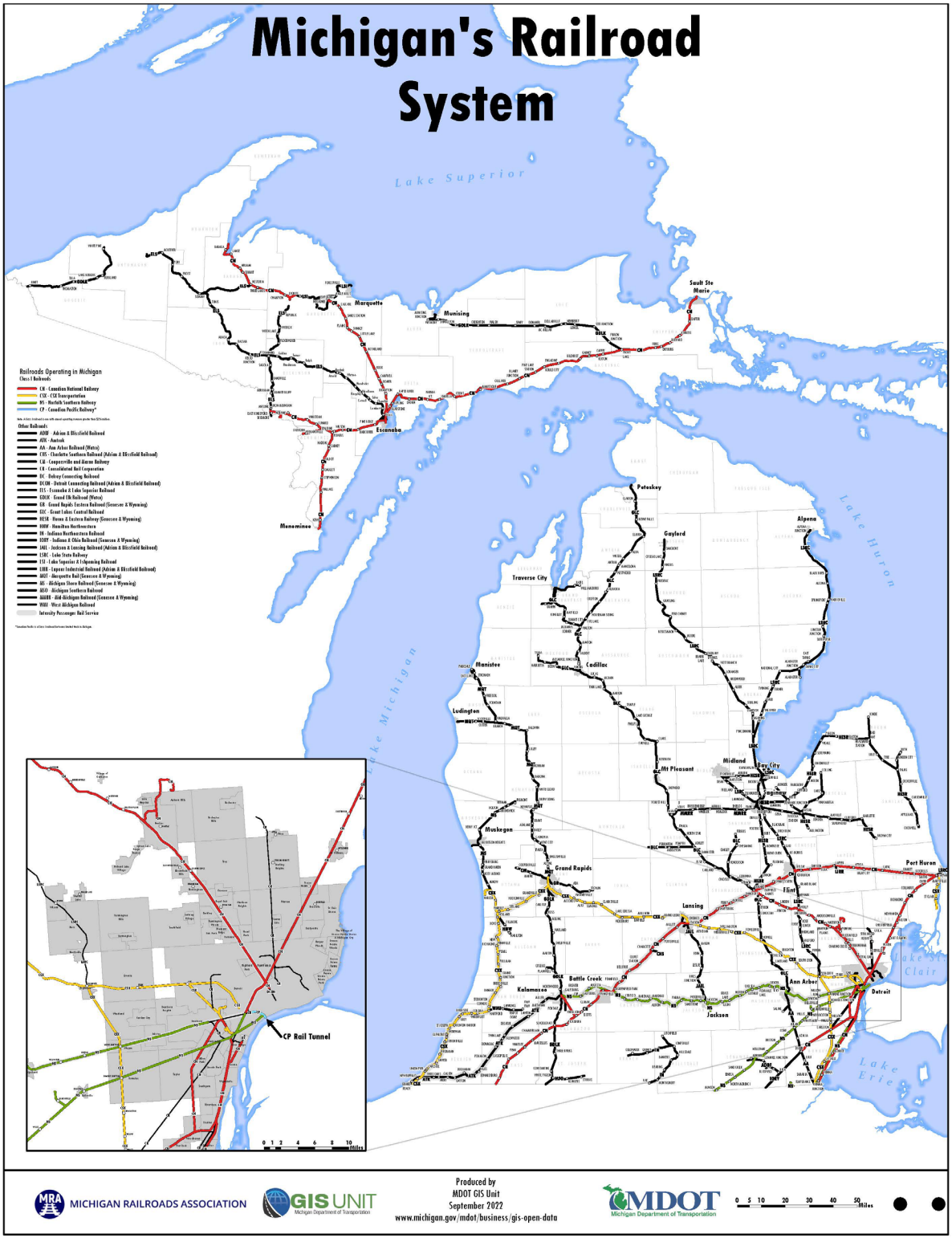
MISSAUKEE COUNTY

A recycling millage supports the operation of the Missaukee County Recycling Center.

WEXFORD COUNTY

None

APPENDIX D: RAIL MAP



APPENDIX E: CASE STUDIES

Glass:

NORTHERN VIRGINIA

CLIFTON, NEW JERSEY

KANSAS CITY, MO

NORTH CAROLINA

Organics:

OTTAWA COUNTY, MI

CHaRM/Super Drop-off

BOULDER, CO

MATERIAL: GLASS

Collection Type: Drop-off centers

LOCATION: NORTHERN VIRGINIA

In 2019, Fairfax County, City of Alexandria, Prince William County, and Arlington County began a strategic partnership to recover and recycle glass. In Northern Virginia, glass collected in curbside recycling bins is sent to recycling facilities where it eventually ends up in landfills due to the lack of MRF clean up equipment and nearby end markets. During the transportation process to the facility, glass is broken and becomes mixed with recycling residue (small bits of plastic and paper) as part of the sorting process, making it unrecoverable. To tackle this challenge, these jurisdictions have committed to collecting glass via purple glass-only drop-off containers and bringing it to Fairfax County's "Big Blue" processing plant, where it will be recycled for use in a variety of projects.

"Fairfax County is proud of this partnership and is looking forward to continuing the growth of true glass recycling in Northern Virginia. By using the unique purple color we are hopeful that our residents will easily be able to identify glass recycling locations throughout NOVA." John Kellas, deputy director of Public Works and Environmental Services.

For partnering jurisdictions, all colors of emptied glass bottles and jars are acceptable materials for glass drop-off. Food residue from jars should be rinsed out before placing glass in the bins. Items that are not accepted include food, plastic bags, lamps or light bulbs, ceramics, porcelain, mirrors, windows, and glass sheets.


Regional Drop-Off: Northern Virginia

Fairfax County's glass recycling plan started as a pilot program with 12 purple bins sprinkled throughout the county. They averaged about 100 pounds of glass recycled per week in a county with nearly 1.1 million residents. As of Jan. 31, 2020, the county had recycled approximately 4.8 million pounds – or about 2,400 tons – of glass through 26 purple can locations, all of which weren't being recycled in the single-stream system a year ago, according to Forbes. The program is now averaging 1,000 pounds of glass recycled per month, which includes a noticeable uptick since the county stopped collecting glass in curbside bins in October 2019, he says.

"It's quite a significant increase," Eric Forbes, the director of recycling, engineering and environmental compliance for the Fairfax County Solid Waste Management Program says, noting that his office went from emptying the bins approximately once per week to now emptying some locations three times per week. The glass is picked up by a truck and dropped off at a processing plant in Lorton, Virginia, he says. Rough cost estimates for the program include $650,000 for the glass processing machine and site work, $10,000 per year for maintenance and approximately $50 per ton for transportation and collection, Forbes says. But the program should yield substantial savings for the single-stream system, he adds.

Source:
Glass Recycling Foundation
Fairfax County and Waste Advantage Magazine

MATERIAL: GLASS

Collection Type: Source-separated curbside

LOCATION: CLIFTON, NEW JERSEY
Total Population: 90,000 • Households: 31,000

Clifton, NJ's recycling source-separated recycling program has been successful since the early 1980s. In 2015, Clifton recycled about 4,300 tons of materials. Of that material, glass containers, separated by color, made up 1,100 tons and brought in $13,900 in glass revenue. Their drop off program is very popular among residents because of their unique curbside collection schedule - once every three weeks.

Clifton's residents are committed to separating their recyclables which has been a key factor in the city's recycling success. Source separation enables Clifton to market loads of color-specific glass. Sales of total recycled materials over the years, combined with recycling grant money from the state, Clifton has grossed about $10 million since launching its program.

The state grant money comes through what's known as a municipal recycling tonnage grant. Funded by a $3 per ton tax on all solid waste accepted for disposal or transfer at New Jersey solid waste facilities, the program makes available grant funds for cities based on how much they recycle each year. Last year Clifton received about $180,000 through the grant program, and $380,000 in revenue from the commodity sales. Color-separated glass containers will remain part of Clifton's curbside and drop-off programs.

SOURCE:
Glass Recycling Coalition
Resource Recycling Magazine and Al DuBois, City of Clifton

MATERIAL: GLASS

Collection Type: Drop-off centers

LOCATION: KANSAS CITY, MISSOURI
Total Population: 475,378 • Households: 221,860

In 2008, Kansas Citians threw away 150 million pounds of glass – hundreds of millions of bottles and jars. To the dismay of the people at Boulevard Brewing Company, Kansas City's hometown brewery, this included some 10 million empty Boulevard beer bottles. And Boulevard was tired of being part of the problem. With the support of local companies and community organizations, they came up with a solution—Ripple Glass. Ripple Glass was founded in 2009 in Kansas City, Missouri. With the construction of a state-of-the-art processing facility and an innovative collection system, Ripple is building a new way to recycle glass.

Ripple's collection program has more than quadrupled Kansas City's glass recycling rate in just a few years. And, it's still growing. Most recycling professionals are familiar with the 20-60-20 rule in which 20% of the population will collect a material and deliver it to a recycling facility, 60% will recycle if it's conveniently collected in a curbside program, and 20% simply won't recycle. Ripple Glass is breaking the 20% glass ceiling for drop-off recycling, and its best practices will help other communities excel in glass recycling too.

Before Ripple Glass, there were only a handful of locations for residents to drop off glass for recycling, and they were all inconvenient. Mostly located in remote, industrial settings, fewer than 10 collection points existed in a metropolitan area that extends nearly 8,000 square miles.

When Ripple Glass launched in November 2009, it significantly increased the number of collection points for residents and businesses making it much easier and faster to deliver glass to a recycling bin. Ripple selected strategic locations based on visibility, convenient access, and surrounding commercial establishments.

Community engagement as a key component to Ripple' s success. Indeed, the program relies on local businesses and organizations as partners. These partners "host" Ripple Glass bins. Hosts provide space for Ripple Glass bins in their lots, tidy up when necessary, and call for service when bins are full. Parking a bin in a host's highly visible parking space (and using bins that are painted a bright, attractive purple) raised community awareness for glass recycling and residents responded. People now recycle while they run errands to grocery stores, box stores, or liquor stores.

Hosting a Ripple Glass bin is good for our partnering businesses as well. Providing this community service increases foot traffic to a commercial center. Surveys of recyclers show that they choose retail destinations based on the availability of a Ripple Glass bin. Furthermore, 65% of recyclers know which host to thank for hosting a bin, and 53% make purchases at the host's stores and surrounding stores when they recycle.

Before Ripple Glass, less than 4% of glass in the Kansas City metropolitan area was collected for glass recycling. Building a ground-breaking collection system overcame the barriers which kept people from recycling: lack of recycling locations. Today, Ripple Glass collects more than 20% of metro area glass, and it's still growing.

Source:
Glass Recycling Coalition
Ripple Glass 2016

MATERIAL: GLASS

Collection Type: Drop-off centers

LOCATION: NORTH CAROLINA

The North Carolina Department of Environmental Quality (NC DEQ) leads the effort to protect North Carolina's environmental resources through regulatory programs designed to protect air and water quality, public health, energy strategy, and responsible behavior with respect to the environment. The NC DEQ has a goal to fill gaps in community glass recycling efforts.

The NC DEQ and Glass Recycling Foundation (GRF) co-funded grants to several communities to increase access to glass recycling:

Village of Pinehurst: In late 2018, Moore County no longer accepted glass in the comingled recycling stream and set up seven drop-off sites throughout the county collecting 671 tons of glass in FY2021. Residents of Pinehurst were frustrated with the lack of a convenient drop-off location within the village limits. Pinehurst received $15,000 from NC DEQ and $5,000 from GRF to set up a drop-off glass recycling site within the municipal limits of the village including a 20 cubic yard roll-off container, concrete pad, and ramp/platform to allow resident access to the container.

Moore County: The county currently collects glass at seven drop-off sites and has a covered area at the county landfill to store glass before it is hauled to Strategic Materials for processing. The $33,500 grant from NC DEQ and $12,000 grant from the GRF was used to expand the glass bunker, increasing the capacity and improving the quality (reducing contamination) of the glass recycling program. The grants will also be utilized to make improvements to the glass collection sites.

Pitt County: The county removed glass bottles and jars from the comingled stream in July 2020. In 2021, the county purchased containers and began collecting glass at 14 staffed convenience sites in the county. The county received $52,500 from NC DEQ and $18,000 from GRF in grants to construct a glass bunker at the transfer station to expand capacity to accept glass from outside communities and improve the economics of the program.

GLASS RECYCLING IMPACT

The following targets have been set by each of the communities:

- Pinehurst targets recovering 215 tons of glass collected in year one.
- Moore County anticipates a 10% increase in glass recovery (67 tons).
- Pitt County estimates increasing glass recovery and improving hauling efficiency from 2-4 tons per trip up to 20 tons per trip.

"The NC DEQ is excited to co-fund these projects with the GRF and support the long-term viability of glass recycling in North Carolina," said Wendy Worley, Recycling and Materials Management Section Chief at the NC DEQ. "We anticipate these projects making a significant impact on glass recovery in the state and sending a strong positive signal to policymakers and the public about glass recycling."

MATERIAL: ORGANICS

Collection Type: Community Drop-off

OTTAWA COUNTY, MICHIGAN

Ottawa County received a grant from Michigan EGLE to pilot a food waste collection program at their existing Environmental Sustainability Centers. These centers are gated, have staff present when they are open, and host their HHW and recycling drop-off stations.

The compost drop-off program accepts food waste only, including bones, meats, coffee grounds, compostable containers (will say on container). They do not accept yard waste, cartons, residential recyclables, glass, or metal. When delivered to the Environmental Sustainability Center, the compost must be in compostable bag (provided). The program is for residential and small business use and requires completion of a simple form and payment for the bags.

Residential and commercial costs to participate are based on the number of bags to be filled:

- 1 Bag for $5
- 3 Bags for $12
- Monthly Bin Exchange $40
  - Up to 5 bins at a time
  - Unlimited exchanges
  - Liners included

There are four locations that offer the same services, including organic drop-off:

- Grand Haven
- Holland
- Coopersville
- Georgetown

Other communities in Michigan have also implemented food waste collection programs in different ways:

City of Ferndale, MI
https://www.ferndalemi.gov/resources/compost-pilot-program

City of East Grand Rapids, MI
https://www.eastgr.org/DocumentCenter/View/3160/EGR-Food-Scraps-Composting-Rules-Regulations-FINAL-62022

Source:
https://www.miottawa.org/Health/OCHD/ES/composting.htm

MATERIAL: MULTIPLE

Collection Type: CHaRM // Super Drop Off

LOCATION: BOULDER, COLORADO

Eco-Cycle launched recycling in Colorado in 1976, and today is one of the nation's oldest and largest nonprofit recyclers and a leader of the Zero Waste movement. For over 46 years, their local Zero Waste models have helped transform our "take-make-waste" society, conserving natural resources and providing climate solutions. They work with every sector of the community to innovate, implement, and advocate for local and global Zero Waste solutions to foster a more regenerative, equitable, and climate-resilient future.

The Eco-cycle Center for Hard-to-Recycle Materials currently diverts twenty-five (and counting!) categories of hard-to-recycle materials from the landfill, and always strives to expand the materials list for the benefit of the community.

How to Use the CHaRM

1. Your first stop at the facility is the **CHaRM window**. CHaRM does not take appointments, so customers can visit any time during the business hours.

   Enter by vehicle through the gate and follow the blue signs for CHaRM. At the window, a member of the register team greets customers and ask about what's being brought in to recycle. The place of residence does not determine eligibility to use the CHaRM or affect fees.

   The cashier will assess the recycling fees and provide directions for where to deposit materials. Electronics recycling customers will be directed to pay at the second register in Zone 3, operated by Blue Star Recyclers, the electronics recycling partner.

2. The CHaRM is set up along a central lane with zones dedicated to specific materials. The zones are organized by a combination of material type, collection container, and the volume of each material received. Collection containers at CHaRM vary in style and size. Many have been custom-built for CHaRM, and some have become the standard for similar sites around the country.

3. Once finished, loop around to the exit or CHaRM's next-door neighbor, Resource Central, to make a reuse donation or purchase reuse items.

Funding

A $3 facility usage fee is charged per visit (except for scrap metal drop-off), plus fees associated with each material listed below:

Item	Fee	Item	Fee	Item	Fee	Item	Fee
Scrap Metal	-	Smoke Detectors	$15 ea	Books	-	Textiles	-
Small Plastic Appliances	-	Plastic Bags & Other Films	-	Paper Shredding (service)	$5/file box	Glassware	-
Freon Appliances	$15 ea	Solar Panels	$1.25 per lb	Ceramics & Concrete	Varies: $.10 per pound to $25 ea	Single-Stream "Curbside" Recycling	-
Electronics	Varies: $.69 per lb - $12 ea	Rigid White Foam	-	Bikes & Parts	-	Compost	Varies: Free to $36
Cables & Wire	-	Large Plastics		Bike Tires or Tubes	$.50 ea	Vegetable Oil	-
Printer Cartridges	-	Mattresses	$10-27 ea	Fire Extinguishers	$8 ea	Corrugated Cardboard	-

Administration

CHaRM is a specialty recycling facility that collects the most common consumer discards that are challenging to divert from the landfill. One of the factors making these materials difficult to recycle is that the cost to recycle them exceeds their value in the secondary materials market once processed. An old mattress, for instance, requires a large investment of time to dismantle into discrete materials—such as metal, wood, and textiles—that can be recycled. In addition to the cost of processing, many CHaRM materials must be shipped considerable distances to the nearest end markets.

The costs of processing and transportation require CHaRM to assess fees that enable this social enterprise to continue providing our services. These fees are routinely audited to ensure they are as low as possible so that fees do not become a barrier to responsible recycling.

In addition to user fees, CHaRM is also funded in part by the City of Boulder trash tax dollars.

Other communities in Michigan have also implemented CHaRM/Super Drop Off Centers in different ways:

Kent County, MI – North Kent Recycling & Waste Center – www.reimaginetrash.org

Ottawa County, MI – Environmental Sustainability Centers - www.miottawa.org/Health/OCHD/ES/default.htm

Source:

EcoCycle

APPENDIX F: COUNTY CHARACTERISTICS

Table 4 US Census Bureau Decennial Census 2020, unless otherwise noted

County	Population	Square Miles of Land Area	Rank in State (land area)	Households [7, 8]	Employer Establishments [9, 10]	Median Age (years)
Antrim	23,431	475.5	76th	10,166	548	51.6
Benzie	17,970	319.7	83rd	6,940	455	50.1
Charlevoix	26,054	416.3	80th	11,725	802	49.1
Emmet	34,112	467.5	77th	14,197	1,534	45.7
Grand Traverse	95,238	464.3	78th	40,083	3,395	43.4
Kalkaska	17,939	559.7	54th	7,173	330	44.3
Leelanau	22,301	347.2	82nd	9,201	747	54.6
Manistee	25,032	542.3	62nd	9,701	558	49.5
Missaukee	15,052	564.8	49th	6,194	299	43.3
Wexford	33,673	565.0	48th	13,212	882	41.7
TOTAL	**310,802**	**4,722.3**	**-**	**128,592**	**9,550**	**-**

[7] A household includes all the people who occupy a housing unit. (People not living in households are classified as living in group quarters.) A housing unit is a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. Separate living quarters are those in which the occupants live separately from any other people in the building, and which have direct access from the outside of the building or through a common hall. The occupants may be a single family, one person living alone, two or more families living together, or any other group of related or unrelated people who share living arrangements. Persons per household, or average household size, is obtained by dividing the number of people in households by the number of households. (US Census Bureau definition)

[8] 2020 American Community Survey 5-Year Estimates

[9] 2020 Economic Survey of Business Patterns

[10] Based on subnational economic data by industry (NAICS code), including the number of establishments, employment during the week of March 12, first quarter payroll, and annual payroll

APPENDIX G: BENCHMARK RECYCLING STANDARDS

RECENT CHANGES TO PART 115 OF PUBLIC ACT 451 OF 1994

In December 2022, Governor Whitmer signed into law a series of bills that revised state solid waste planning processes. These laws will fundamentally change the way counties approach planning, transitioning from solid waste planning to materials management planning.

The Michigan Recycling Coalition[11] characterizes the changes as a way to:

- Provide a policy framework supporting investment in productive materials management as an economic driver
- Update and broaden the county planning process to encourage sustainable materials management
- Ensure adequate local capacity for managing materials
- Prioritize local control of facility siting and regulation of landfill development
- Require adequate financial assurance for all permitted facilities, including landfills
- Allow for the development of new recycling technologies and facilities
- Establish benchmark standards to ensure access to recycling opportunities across the state
- Specify local funding mechanisms that can be used to support materials management
- Preserve the ability to flow material to publicly-managed facilities
- Eliminate import/export authorizations for disposal
- Support business commitments to a circular economy

Additionally, the changes will:

- Level the playing field for all materials management facilities – disposal, recycling, composting, and others.
- Remove policy preference for landfill disposal.
- Set recycling and material utilization goals that reflect local communities.
- Establish benchmark recycling standards to assure services are provided.
- Assist local governments in planning and materials management.
- Update regulations and oversight tools to meet the needs of a changing industry.

[11] Michigan Recycling Coalition www.michiganrecycles.org/part-115-update/

Notably, House Bill 4454 12 defines Benchmark Recycling Standards, lays out a minimum level of service that counties will become responsible for ensuring are met. The Standard is written:

By January 1, 2026, at least 90% of single-family dwellings in urban areas as identified by the most recent federal decennial census and, by January 1, 2028, at least 90% of single-family dwellings in municipalities with more than 5,000 residents have access to curbside recycling that meets all of the following criteria:

- *One or more recyclable materials, as determined by the county's material management plan, that are typically collected through curbside recycling programs, are collected at least twice per month.*
- *If recyclable materials are not collected separately, the mixed load is delivered to a solid waste processing and transfer facility and the recyclable materials are separated from material to be sent to a solid waste disposal area.*
- *Recyclable materials collected are delivered to a materials recovery facility that complies with part 115 or are managed appropriately at an out-of-state recycling facility.*
- *The curbside recycling is provided by the municipality or the resident has access to curbside recycling by the resident's chosen hauler.*

By January 1, 2032, the following additional criteria:

- *In counties with a population of less than 100,000, there is at least 1 drop-off location for each 10,000 residents without access to curbside recycling at their dwelling, and the drop-off location is available at least 24 hours per month.*
- *In counties with a population of 100,000 or more, there is at least 1 drop-off location for each 50,000 residents without access to curbside recycling at their dwelling, and the drop-off location is available at least 24 hours per month.*

[12] Michigan Legislature http://www.legislature.mi.gov/documents/2021-2022/billintroduced/House/pdf/2021-HIB-4454.pdf