Charlevoix County
Materials Management Planning Committee

Date: April 23, 2026
Time: 10:00 a.m. – 12:00 a.m.
Location: Shirley Roloff Center
Committee Room
13513 Division Street
Charlevoix, MI 49720

PROPOSED AGENDA - Revised

I. **Call to Order**
II. **Public Comment**
III. **Approval of Agenda**
IV. **Approval of March 26, 2025 Meeting Minutes (pgs. 2-30)**
V. **Data Analysis Review and Discussion - RRS (pgs. 31-73)**
VI. **Materials Management Planning**
    a. **Process Update**
    b. **Draft Language Review**
        i. **Siting Criteria**
    c. **Contract Mechanisms**
    d. **Action Plan Discussion**
    e. **Goals and Objectives**
VII. **Committee Member Comments**
VIII. **Public Comment**
IX. **Adjourn**

Posted:_____

Signature: _____

Charlevoix County
Materials Management Planning Committee Minutes
March 26, 2026 at 10:00 AM
Charlevoix County Shirley Roloff Center
13513 Division Street Charlevoix, MI 49720

MMPC Member Attendance			
Victor VanDeventer *rep. of a solid waste disposal facility*	*P*	*Annemarie Conway* *elected official of the county*	*P*
Kirk Miller *rep. of a hauler*	*P*	*Robin Hissong-Berry* *elected official of a township*	*P*
Andre Grobaski *rep. of a materials recovery facility (MRF)*	*E*	*Vacancy* *elected official of a city or village*	-
Sarah Roy *rep. of a composting facility*	*E*	*Jonathan Scheel* *business rep. generating material*	*P*
Mark Bevelhymer *rep. of waste diversion, reuse, or reduction*	*E*	*Isha Pithwa* *rep. of the regional planning area*	*P*
Kyra Allen *rep. of an environmental interest group*	*P*	*Josh Chamberlain* *additional member per part 115*	*E*
		Attendance Key: *P – Present* *A – Absent* *E - Excused Absence*	
Staff in Attendance: Kiersten Stark (Charlevoix County), Josh Cline (Charlevoix County), Lora Roberts (Charlevoix County), Mathew Cooke (DPA-Networks Northwest)			

I. Call to Order, Pledge of Allegiance

Jonathan Scheel, Chair, called the meeting to order at 10:07 a.m.

II. Public Comment

None.

III. Review Proposed Agenda

Motion by Kirk Miller, supported by Annemarie Conway, to approve the March 26, 2026 MMPC agenda as presented. Motion carried unanimously.

IV. Previous Meeting Minutes

Motion by Kirk Miller, supported by Victor VanDeventer, to approve the November 22, 2025 MMPC Meeting Minutes as presented. Motion carried unanimously.

V. Election of Officers

Motion by Victor Vandeventer, supported by Kirk Miller, to nominate and elect Jonathan Scheel as Chair of the Charlevoix County Materials Management Planning Committee. Motion carried unanimously.

Motion by Victor Vandeventer, supported by Kirk Miller, to nominate and elect Annemarie Conway as Vice-Chair of the Charlevoix County Materials Management Planning Committee. Motion carried unanimously.

Motion by Victor Vandeventer, supported by Kirk Miller, to nominate and elect Kyra Cunningham as Secretary of the Charlevoix County Materials Management Planning Committee. Motion carried unanimously.

AC/RB - 2026 meeting schedule

VI. 2026 Meeting Schedule

Motion by Annemarie Conway, supported by Robin Hissong-Berry, to approve the 2026 Meeting Schedule. Motion carried unanimously.

VII. Materials Management Planning

a. Data Analysis

The MMPC discussed the data analysis draft with the following discussion points:

- Inconsistencies with the data reported
- Support that the pounds per person used was higher than what Charlevoix actually sees
    - 4.6 pounds per person is 7 times more than we currently produce
- Part of the planning process is to get better data to get good numbers
- Using a hauler licensing ordinance to require better data

- Future Request for Proposals for recycling contracts to include better data reporting and end markets for material streams
- How to track what happens to materials that go into transfer station
- The county gets recycling monthly data, how can we get for trash?
- Seasonal population consideration
- Mathew Cooke will get in contact with Andre Grobaski to reinforce the need for GFL to be present at meetings for discussion and clarification as the major hauler

b. Language Review

Mathew Cooke reviewed the drafts of the Community Input, Previous Planning, and Existing Conditions. Comments included:

- We have existing information on what and where things can be recycled, how do we drive them to this information? Add this to the Goals and Objectives.
- The need for people to break down boxes
- How do we take the ongoing strategies from the previous solid waste and create actionable items?
- Reference the County Capital Improvement Plan

c. Goals and Objectives

The MMPC looked at the updated Goals and Objectives worksheet with the following comments:

- Business Food Waste - working with Emmet County to service Charlevoix, Boyne City, and East Jordan Businesses
- Considering organics in the County
    - Pilot food waste programs for a municipality
    - Farmers Market Food Waste Collection
    - Where we currently do yard waste, how can we implement food waste?
    - Shared staff to flip compost
    - Involving schools
    - Training, such as Master Composter, for County Staff

d. Siting Criteria

Mathew Cooke provided a brief overview of what the siting criteria involves (see attached presentation).

e. Funding Mechanisms

Mathew Cooke provided an overview of the different funding mechanisms for materials management planning (see attached). It was noted that the County already has a recycling millage, up for renewal in 2028.

VIII. Committee Member Comments

None.

IX. Public Comment

None.

X. Adjourn

Chair Jonathan Scheel adjourned the March 26, 2026 meeting at 11:51 am.

MMP Siting Criteria Overview

What is the Siting Criteria?

- Creates a mechanism for land use regulation
- Part 115 preempts the Michigan Zoning Enabling Act
- The siting process should describe how a proposal is submitted to a designated entity for review and approval.
- Siting refers to the physical location and placement of uses and structures- a siting process should not include requirements that regulate any process or activity that occurs in connection with a facility.

Materials Management Facility Types

Solid Waste Landfills

Processing and Transfer Facilities

Municipal Solid Waste Incinerators

Waste Diversion Centers

Materials Recovery Facilities

Composting Facilities

Anaerobic Digesters

Innovative Technology Facilities

A review of consistency and siting process may not necessarily include physical siting requirements.

- Some siting processes incorporate additional public engagement and opportunity to identify issues in the approval process.
- Generalized areas of siting consideration - such as in existing industrial districts
- Some say that the Plan must be amended to consider and include a new facility.

Siting Criteria Considerations

- Authorization of Facility Types
- Consistency with MMP
- Proposal process and requirements
- Siting Criteria and what is necessary to meet
- Host Community Agreement? If not, parameters for proposals without?

MMPC Discussion

- What is the overall need for various types of facilities as indicated by your MMP?
- What are the priorities and goals for facility development in your MMP?
- What were the past requirements for facility development in your previous Solid Waste Plan?
- What are the current requirements included in local zoning regulations for materials management facilities?
- What gaps are there in these where additional siting requirements may be necessary to protect the health, safety, and welfare of residents within your planning area?

RRS

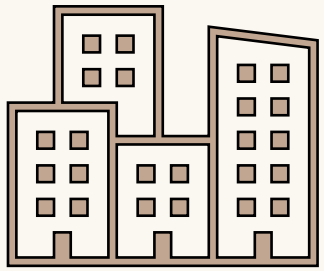
Michigan Public Sector Funding Mechanisms

FUNDING PATHWAYS FOR PUBLIC SECTOR PROGRAMS

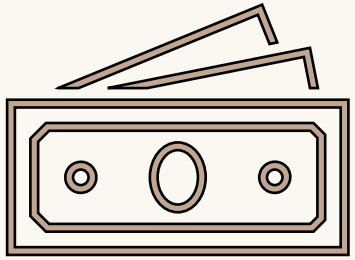
UPDATED MARCH 2026

County initiated funding approaches

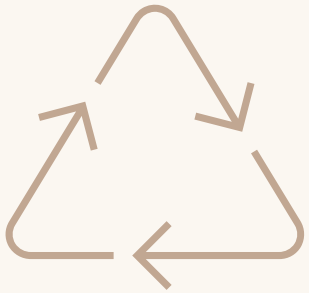
Act 185 county public works assessment



Must have an Act 185 Department of Public Works

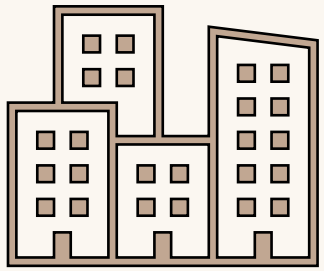


Collection of a flat fee assessment over a set time period

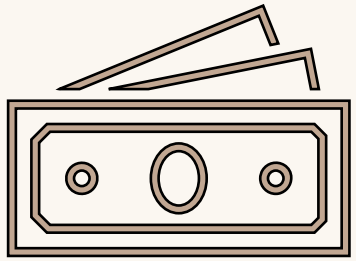


Washtenaw County uses it to fund programs of the Western Washtenaw Resource Recovery Authority (WWRA)

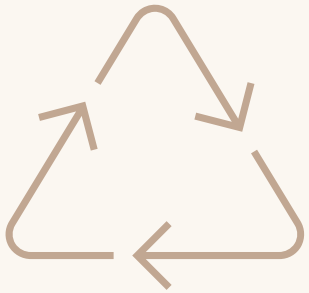
Act 69 and Act 138 surcharge fees



- Act 69: Voter approval of resource recovery charge
- Act 138: Local elected official's approval of resource recovery charge

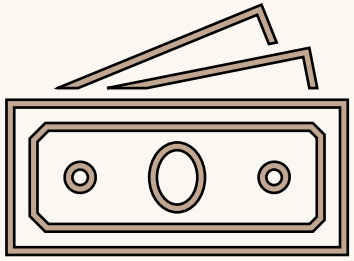


- Act 69: Up to $50 per household/business per year (collected as part of County's winter taxes)
- Act 138: Up to $25 per household per year

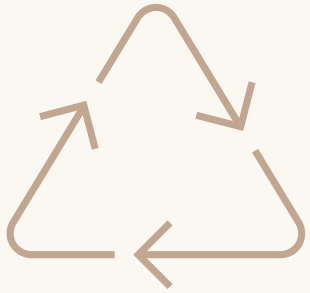


- Act 69: Leelanau County
- Act 138: Benzie County, Allegan County, and Clinton County for local drop-off programs, HHW, etc

Hauler license resource recovery fee

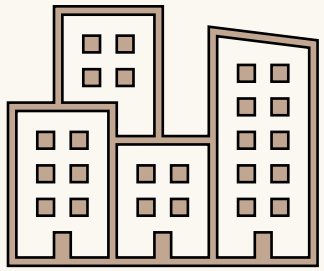


Haulers charged a Resource Recovery Charge for each household and commercial account

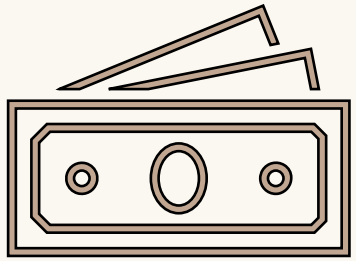


Eaton County, used for over 10 years ($9.60 hh/yr and $40/commercial account per year)

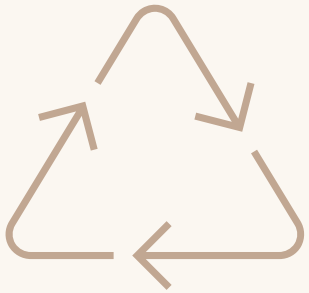
Landfill / transfer station surcharge



Imposed by ordinance/licensing mechanism, by host agreement/contract, or as part of the budget of publicly owned facilities



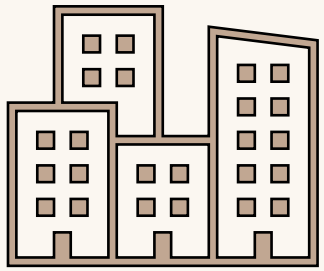
Resource Recovery Fee applied to incoming residential and commercial tons of waste



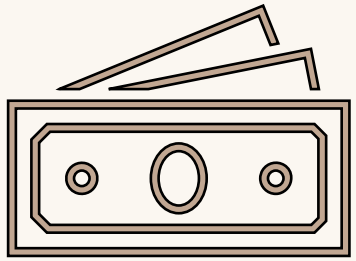
This is the most common approach used by Michigan Counties

- Emmet, Saginaw, Grand Traverse, Leelanau (host), Sanilac, Clinton, Genesee, Ottawa (host), Berrien, Macomb, Wayne, Washtenaw (host), Monroe, Kent (ordinance), Calhoun (host) and more

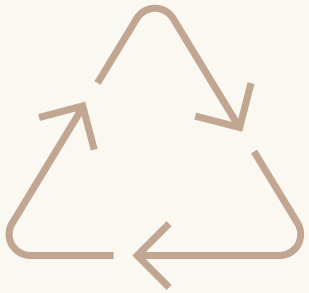
Voter approved county-wide millage



Majority voter approval

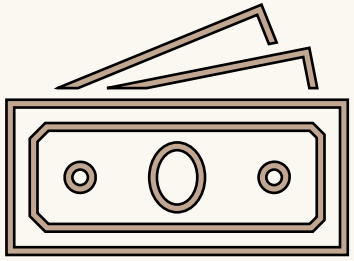


Millage to fund the capital or operating costs of resource recovery programs

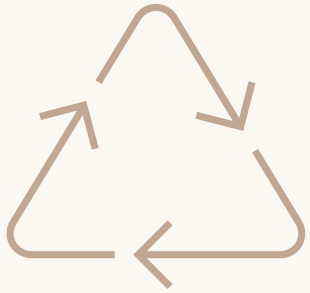


- Emmet County – temporary millage for the original recycling program's capital costs
- Charlevoix County – drop-offs and HHW
- Chippewa County – drop-offs/MRF operated by disabled worker non-profit
- Iosco County – 6 yr operating
- Delta County

Supplemental fees for service



Additional charges and supplemental fees are used to cover costs for value added services

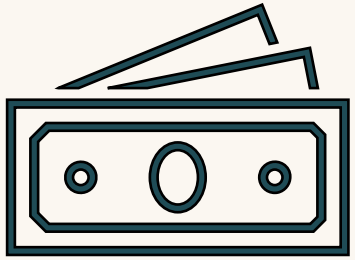


- Washtenaw County's Drop-off Station (City site – RAA operates) covers more than 80% of the costs with user fees for waste, construction debris, tires, and electronic waste
- Emmet County

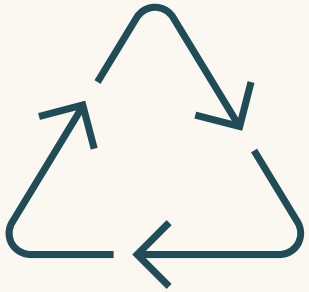
Local unit-initiated funding approaches

Legislatively authorized millages

Elected body approval of the "annual garbage tax"



- Cities and villages can collect up to 3 mils for refuse and recycling programs
- Charter Townships can collect up to 2 mils

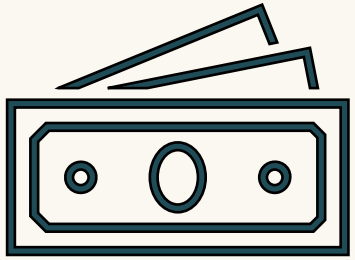


Most common method for funding refuse and recycling programs

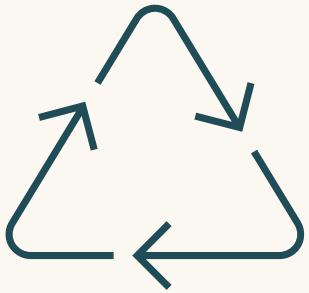
- Royal Oak, Ann Arbor, and the Charter Township of Ypsilanti

Municipal utility/service fees

> Establishment of an exclusive service provision (e.g., waste collection)



Residents charged for service through utility billing system or other user fee system



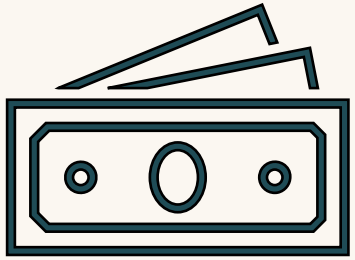
Second most common method for funding refuse and recycling programs:

> Large cities: Holland and Lansing

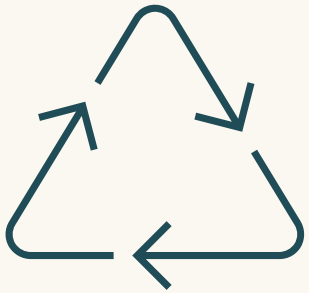
> Small community: Coldwater

Hauler franchise / hauler collected fees

Exclusive hauler contract/franchise for waste collection with bundled recycling services



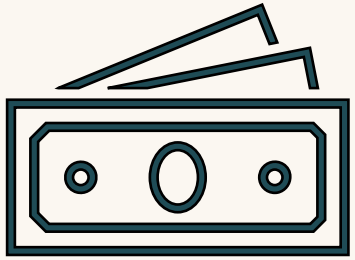
Hauler is responsible for service provision and fee collection



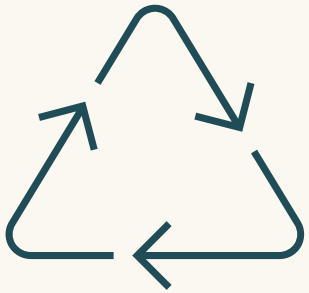
- Shelby Township in Macomb County
- Superior Township in Washtenaw County
- Scio Township

Voter approved program millage

Majority voter approval

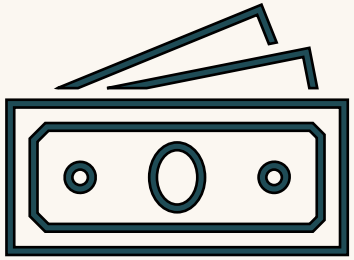


Millage to fund the capital or operating costs of resource recovery programs



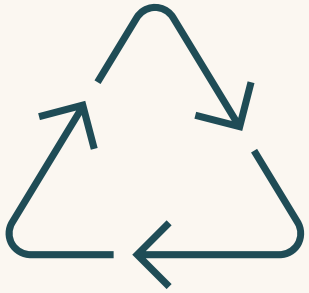
- Royal Oak
- Grand Rapids
- Temporary use in the City of Ann Arbor
- Ypsilanti Charter Township
- Kalkaska County

General fund



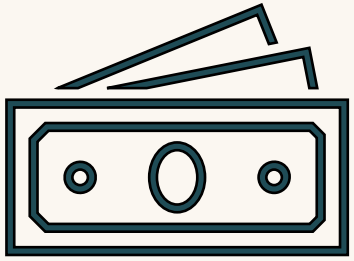
Local units cover resource recovery program costs out of their general fund

> Most often used when program offerings have a limited scope or programs are provided jointly through a larger inter-governmental project

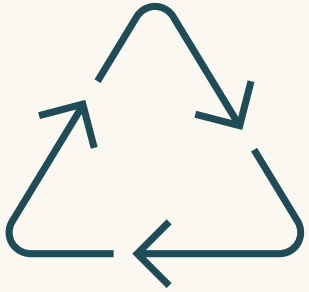


Northern Oakland County NO-HAZ consortium household hazardous waste collection program

Supplemental fees for service



Additional charges and supplemental fees are used to cover costs for value added services



The City of Ann Arbor's Drop-off Station covers more than 80% of the costs with user fees for waste, construction debris, tires, and electronic waste

Grand Rapids residents participate in a cart-based pay-as-you-throw system and recycling is paid for through a millage.

COUNTY INITIATED FUNDING APPROACHES

The following can be initiated and managed by the County although some require local unit and/or voter approval.

Funding System/Description	Best Uses and Least Preferred Uses
Act 185 County Public Works Assessment: This funding mechanism is used in water, sewer, refuse/recycling and related environmental projects by counties that have a organized an Act 185 Department of Public Works. Specific procedures must be followed to develop a project including an engineer's cost estimate and required public hearings and county/local approvals. This allows collection of a flat fee assessment for the project over a set time period. (Public Act 185, 1957, MCL 123.732)	Best Used for: - Recycling/Waste Program Expenses (MRFs[1], drop-offs, cleanups, curbside) - Special Material Programs (HHW[2], e-Scrap, Batteries, etc.) - Admin Expenses Also Works for: - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion Can be used for trash system costs as well
Act 69 and Act 138 Surcharge Fees: With Act 69, through County and local unit resolutions, voters in each jurisdiction are asked to approve this resource recovery charge (up to $50) per household/business per year that can then be collected (if voters approve in that local unit) by the County as part of winter taxes. This is similar to a PA 138 fee that is limited to households only with a maximum of $25/year, but just requires approval by the elected officials of the local unit. (Act 69, 2005, Act 138, 1989, Urban Cooperation Act 7 of 1967, MCL 124.508a)	Best Used for: - Recycling Program Expenses (drop-offs, curbside) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) Also Works for: - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion Cannot be used for trash system costs
Hauler License Resource Recovery Fee: Licensed haulers can be charged a "Resource Recovery Charge" for each household and commercial account and be required to pass through that charge as a line item to their customers. The charge would be set as part of the annual budgeting process to cover all costs for Resource Recovery Programs. Each hauler's share is then based on their percentage of the market.	Best Used for: - Recycling Program Expenses (drop-offs, curbside) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) Also Works for: - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion

[1] MRF is an acronym for Material Recovery Facility – a type of recycling processing facility
[2] HHW is an acronym for Household Hazardous Waste – a type of collection program for residentially generated hazardous wastes

COUNTY INITIATED FUNDING APPROACHES - Continued

The following can be initiated and managed by the County although some require local unit and/or voter approval.

Funding System/Description	Best Uses and Least Preferred Uses
Landfill Surcharge: A Resource Recovery Fee can be imposed by ordinance/licensing mechanism (e.g., Grand Traverse County), by contract (e.g. Clinton County) or as part of the budget of publicly owned facilities (like Wexford and Emmet). Applies to all incoming tons (residential and commercial) and varies with incoming waste volumes. Can be implemented for use at transfer stations as well.	Best Used for: - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion Can Work for: - Special Material Programs (HHW, e-Scrap, Batteries, etc.) Also works for: - Recycling Program Expenses (drop-offs, curbside)
Voter Approved County-wide Millage: The majority of voters in the County can approve a millage to fund resource recovery programs, either for capital or operating costs. Majority approval of voters would implement this funding mechanism county-wide. Almost always has a sunset clause (e.g. 5 years) to require re- evaluation and re-voting by citizens.	Best Used for: - Recycling Program Expens (drop-offs, curbside) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) - One Time Capital Costs (e.g. Building) Also Works for: - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion
Supplemental Fees for Service: Additional charges and supplemental fees are used by many municipalities to cover costs for value added services that some but not all citizens use and that citizens often expect to be provided by their municipality. Examples include curbside bulky waste pickup, curbside brush collection, tire drop-offs and drop-off /convenience center refuse and recycling services.	Best Used for: - Services where Convenience Justifies a Premium (e.g. curbside bulky waste) - Special Materials Programs (e.g. tires, appliances, etc.) Least Suited for: - Recycling Programs - Routine Program costs - Admin Expenses (e.g. staff, planning)

[1] MRF is an acronym for Material Recovery Facility – a type of recycling processing facility
[2] HHW is an acronym for Household Hazardous Waste – a type of collection program for residentially generated hazardous wastes

LOCAL UNIT INITIATED FUNDING APPROACHES

The following can be initiated and managed by local units independent of the County.

Funding System/Description	Best Uses and Least Preferred Uses
Legislatively Authorized Millages: Cities and villages are authorized by Act 298 of 1917 (MCL 123.261) to collect up to 3 mils for refuse and recycling programs. The elected body approves the "annual garbage tax" as part of their annual budgeting process, with the funds being collected as part of the next tax cycle. Charter Townships are authorized to collect up to 2 mils.	Works Well for: - Recycling/Waste Program Expenses (MRFs, drop-offs, cleanups, curbside) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion
Municipal Utility/Service Fees: A local unit can establish an exclusive service provision (e.g., waste collection) and charge for that service through a utility billing system or other user fee system. This is a common method when a local unit already has other utility billing systems in place (water, sewer, electricity). The fee system can include pay per volume features (aka "pay-as-you-throw" or PAYT) - an incentive for waste reduction and recycling.	Works Well for: - Recycling/Waste Program Expenses (curbside, MRFs, drop-offs, cleanups) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion
Special Assessment Districts: Michigan Townships (Public Act 188, 1954 MCL, 41.721) and Villages (Public Act 116, 1923, MCL 41.411) can create special assessment districts for improvements that provide for waste and recycling services. Many of Michigan's townships and villages use this approach in contracting and paying for solid waste and recycling services.	Works Well for: - Recycling/Waste Program Expenses (curbside, MRFs, drop-offs, cleanups) - Special Material Programs (HHW, e-Scrap, Batteries, etc.) - Admin Expenses (e.g. staff, planning) - Outreach/Education/Promotion
Hauler Franchise and Hauler Collected Fees: A local unit can award an exclusive hauler contract/franchise for the collection of waste from residential and/or commercial sources and bundle recycling services in with contract. The hauler is responsible for providing all services and collecting the fees from system users following a pricing schedule contained in their franchise/contract with the local unit.	Best Used for: - Bundled Refuse/Recycling/Yard Waste Collection Program - Limited Education and Outreach Least Suited for: - Admin Expenses (e.g. staff, planning) - Special Material Programs (HHW, e-Scrap, Batteries, etc.)

[1] MRF is an acronym for Material Recovery Facility – a type of recycling processing facility
[2] HHW is an acronym for Household Hazardous Waste – a type of collection program for residentially generated hazardous wastes

LOCAL UNIT INITIATED FUNDING APPROACHES - Continued

The following can be initiated and managed by local units independent of the County.

Funding System/Description	Best Uses and Least Preferred Uses
Voter Approved Program Millage: The majority of voters in the City can approve a millage to fund resource recovery programs, either for capital or operating costs. Majority approval of voters would implement this funding mechanism. These almost always have a sunset clause (e.g., 5 years) to require re-evaluation and re-voting by citizens. Some are temporary millages limited in scope to specific capital projects.	Best Used for: - New Program Initiatives - One Time Program Expansions - Special Material Programs (HHW, e-Scrap, Batteries, etc.) Least Suited for: - Routine Program costs - Admin Expenses (e.g. staff, planning)
General Fund: Some local units have managed to cover resource recovery program costs out of their general fund, most often when the program offerings are limited in scope (e.g. spring/fall cleanups) or are provided jointly through a larger inter-governmental project (e.g. regional household hazardous waste services).	Best Used for: - Limited Program Initiatives - Special Material Programs (HHW, e-Scrap, Batteries, etc.) Less Likely Suited for: - Routine Program costs - Admin Expenses (e.g. staff, planning)
Supplemental Fees for Service: Additional charges and supplemental fees are used by many municipalities to cover costs for value added services that some, but not all citizens use and that citizens often expect to be provided by their municipality. Examples include curbside bulky waste pickup, curbside brush collection, tire drop- offs and drop-off /convenience center refuse and recycling services.	Best Used for: - Services where Convenience Justifies a Premium (e.g. curbside bulky waste) - Special Materials Programs (e.g. tires, appliances, etc.) Least Suited for: - Recycling Programs - Routine Program costs - Admin Expenses (e.g. staff, planning)

[1] MRF is an acronym for Material Recovery Facility – a type of recycling processing facility
[2] HHW is an acronym for Household Hazardous Waste – a type of collection program for residentially generated hazardous wastes

Memo

TO: Mathew Cooke, Networks Northwest
FROM: Caitlyn Wouters and Kristen Wieland, RRS
DATE: April 16, 2026
RE: Charlevoix County MMP Data Analysis - Final

Introduction

The RRS team undertook a comprehensive analysis to support the five counties' waste management planning efforts. As part of this work, RRS developed a baseline data set based on known waste data, where available, and supplemented with modeled projections of waste generation and recovery potential. This data will serve as a foundational resource to guide each committee's decision-making on key planning and policy issues.

The baseline data will support the identification of strategies for meeting the Benchmark Recycling Standards, both in the near term and over the planning horizon. This memorandum presents a summary of the current materials generation and recovery conditions within Charlevoix County. It incorporates modeled data prepared by RRS, along with any available actual data provided by the Networks Northwest planning agency, county MMP Committee participants or municipalities. The information contained herein offers a comprehensive overview of the counties' materials management landscape to serve as a supporting component of the Materials Management Plans.

Recycling Rate

Based on this assessment, RRS estimates that **approximately 54% of landfilled MCW by weight from Charlevoix County is either readily recyclable or compostable**. Based on the available data, as described in detail within this memo, RRS estimates Charlevoix County is currently achieving the following recycling rate (including traditional recycling and organics):

- **Countywide Recycling Rate Estimate:** 13%

Preliminary Opportunities

RRS has highlighted several key opportunities that should be discussed by the MMP Committee for potential goal setting in the next phase of the MMP development. These opportunities are described below, with additional detail provided throughout the memorandum.

While the data points discussed in this analysis are comprehensive and valuable for general understanding of the current recycling and diversion taking place and the general makeup of the waste stream, it is critical to note that the preliminary opportunities outlined below are based on the data and information that was provided to RRS or otherwise publicly available.

Reliable data is a critical component of MMP implementation. In the absence of data, we have supplemented with modeled data based on actual data from other similar regions to provide a starting point for discussion purposes and aid in goal setting. In the case of Charlevoix County, RRS found the per capita MCW rate to be extremely low based on the five-year average reported tonnage. An unusually low per capita MCW rate may indicate that a portion of Charlevoix County's MCW is being managed outside of the tonnage attributed to the county in the landfill report. For example, waste generated in the county but disposed at facilities that may be attributed to another county, or disposed through non-landfill pathways that are not captured in the reported landfilled tonnage (illegal burning or dumping). It may also reflect inconsistencies in landfill reporting and categorization practices (e.g., MCW being recorded under another category such as Industrial Waste or C&D). Finally, it is possible that the reported figure accurately reflects atypical disposal dynamics during the analysis period, as described in more detail in the report, though additional data and verification would be required to confirm this.

Additional opportunities to fill data gap for Charlevoix County include:

- To strengthen materials management and accurately measure progress toward the goals outlined in the Materials Management Plan, Charlevoix County should implement consistent, countywide reporting and tracking systems. This includes clarifying and standardizing landfill reporting procedures, expanding the tracking of recycling and organic material collection across municipal, private, and commercial sources, and establishing uniform hauler reporting requirements. These actions will enable the County to capture currently missing data, calculate a documented recycling rate, and monitor material flows more effectively, ensuring a reliable foundation for future planning and performance evaluation.
- Food waste is typically disposed of in the landfill as part of mixed MCW, and without a robust waste audit system there is no clear way to quantify how many tons of disposed MCW are food waste over time. Alternatively, meaningful measurement can be achieved by separating food waste at the source, through food rescue and/or composting programs, and tracking the weight of diverted material. Expanded source separation paired with consistent tonnage reporting would allow the County to quantify diversion more accurately and track reductions in landfilled food waste in a measurable way.
- Establishing consistent reporting of event participation and specific material quantities collected and the disposal/recycling destinations would enhance the County's ability to quantify recovery, identify priority material streams, and track progress over time.

The **Benchmark Recycling Standard** for curbside recycling is being achieved in Charlevoix County. These standards are designed to ensure that counties provide convenient and accessible recycling opportunities for residents and businesses in support of the state's broader recycling goals. Because Charlevoix County does not contain any urbanized areas or communities with populations exceeding 5,000 residents, the first two benchmark standards do not apply.

Currently, there are no municipal or municipally contracted curbside recycling programs operating within the county. However, many residents may be able to subscribe directly with private waste haulers for curbside recycling services on an individual basis. Charlevoix County's recycling program consists of drop-off sites managed by Charlevoix County. Routinely surveying recyclers will ensure the drop-off sites are meeting their needs and engage a committed group of citizens.

The top six materials with diversion significance, by weight, in the county present a prime opportunity for meaningful and measurable impact in the 5-year planning window:

1. Wasted food - discarded food scrap byproducts that are not consumed by humans or food that was edible but ended up wasted - comprises over 4,276 tons of landfill-bound materials generated in Charlevoix County. This category of waste is not only the most significant by weight but is also significant in its potential social and economic value directly within the County. Good food can be redistributed to people in need instead of sent to landfills, thereby supporting the needs of residents through existing food distribution networks. Food that is unsuitable for redistribution can be processed locally through basic backyard composting to generate a soil amendment for use directly by the homeowner. A more sophisticated collection system that aggregates residential and commercial food waste along with other agricultural waste could be processed at a privately operated composting facility or anaerobic digester operator (potentially through a public-private partnership) to generate a large amount of compost to regenerate soils in the entire county and region and support local agriculture. A 2021 study SEEDS noted that Antrim, Benzie, Charlevoix, Kalkaska, Manistee and Missaukee counties all have relatively small amount of organics collection and recommended that these counties focus efforts on food rescue initiatives (recovering edible food before disposal), education on food waste reduction, and promotion of backyard composting practices. Furthermore, the study identified the close proximity to large scale composting operations in Emmet County could present an opportunity for increased organics collection.

2. Plastic film totals over 2,005 tons of landfill-bound materials generated in Charlevoix County. From residential sources, these typically include plastic shopping bags, grocery bags, and dry-cleaning bags. From commercial sources, these thin, flexible plastics could include stretch wrapping used to stabilize pallets and cases, greenhouse and agricultural bale wrapping, shipping pouches and bubble wrap among others. While not typically accepted in single stream recycling programs due to the low value and difficulty in marketing it post-processing, drop-off programs and commercial plastic film collection programs can keep these plastics clean and dry, resulting in significant volumes of valuable material that has strong end market potential.

3. Corrugated cardboard has become a significant waste material type in recent years due to the shift in online purchasing. RRS estimates Charlevoix County is landfilling more than 1,708 tons of cardboard from both residential commercial sources. Cardboard was formerly generated primarily at retail establishments and was sometimes collected for recycling. While online purchasing trends have shifted some tons away from the commercial waste stream and into the residential waste stream, 70% of the cardboard remains in the commercial stream, creating opportunities for increased recovery in both. Local manufacturer, Packaging Corporation of America (PCA) in Filer City (Manistee County), would directly benefit from the additional collection of corrugated cardboard from the Northwest Michigan region.

4. Compostable paper refers to paper products that are typically unsuitable for recycling due to their low quality or because they are often soiled during use, such as paper plates, napkins, facial tissues, and paper towels. When combined with food scraps, this compostable paper could be a valuable input to either composting or anaerobic digestion when done at a commercial scale. This fraction of the waste stream comprises nearly 1,531 tons in the county.

5. Mixed paper, estimated at over 1,243 tons landfilled in the county, is a general grade of clean but varied qualities of mixed fiber materials including mail, office paper, paper bags, books, magazines, greeting cards, index cards, cereal boxes, etc. This paper is often the largest output, by volume, of single stream recycling facilities and has strong Midwest markets ready to accept more material for production of new paper products.

6. Textiles are a significant waste category in Charlevoix County, comprising over 1,006 tons in our model. Clothing, towels, rope, household linen, leather products, and other similar products that are either discarded out of convenience or due to rips, excessive wear, or are otherwise unsuitable for reuse. Local resale stores could be ideal partners to evaluate additional textile recovery opportunities to get more usable textiles into the hands of people who need them, keeping them out of landfills.

Materials that are readily marketable but currently being landfilled offer strong diversion potential due to established recycling channels and typically yield positive economic returns and should be prioritized for enhanced recovery in the Charlevoix Materials Management Plan. While not represented in the top six categories by weight, the following materials have consistent value and market demand and are ubiquitous in the waste stream, making them natural opportunities for increased recovery across the region.

Listed in order from highest-lowest potential yield, these materials include:

- **mixed paper** (as identified above, 1,243 tons)
- **ferrous metal** (473 tons)
- **#1 PET plastic** (bottle and non-bottle) (382 tons)
- **#2 HDPE plastic** (colored and natural) (104 tons)
- **white office paper** (194 tons)
- **magazines** (168 tons)
- **steel cans** (158 tons)
- **newspaper** (139 tons)
- **aluminum cans** (136 tons)
- **#5 PP plastic** (116 tons)
- **polycoated paper cups and cartons** (107 tons)

The materials listed below can be **difficult to recycle due to their bulkiness, weight or other challenges** but are generally frequently requested by community members for recycling and disposal options. As such, RRS recommends these be considered in the development of Charlevoix County's MMP:

Construction and demolition (C&D) materials – primarily clean lumber, pallets, cardboard, concrete, and scrap metal - represent a high-volume opportunity for landfill diversion and reuse. Many of these materials have market value, and reuse programs like Habitat ReStore or other local programs provide both social and environmental benefits. However, current waste characterization studies exclude most C&D debris, meaning its true volume is underrepresented and not well understood. A dedicated study is needed to quantify and stratify C&D materials to develop effective recovery strategies and estimate recovery amounts.

Glass bottles and jars, estimated at 403 tons annually in Charlevoix County, are endlessly recyclable but require clean separation from contaminants to maintain quality. Mixed collection often leads to contamination, reduced yield, and degradation of other recyclables. When local markets are accessible, clean glass can retain material and

economic value; otherwise, it may be diverted to lower value uses like landfill cover. Developing a system to aggregate clean glass for efficient delivery could unlock recycling potential.

Expanded polystyrene (EPS) foam is rarely accepted in curbside recycling because it's difficult to process in automated facilities. When source-separated, it can be recycled but requires densification to improve shipping efficiency and market value. Charlevoix County discards an estimated 201 tons annually, indicating a strong opportunity for recovery if a collection network and basic processing infrastructure are developed.

Electronics (e-waste) have become pervasive in modern life thanks to technological advancements that make them smaller and more affordable, but these same innovations lead to rapid obsolescence, driving consumers to replace them frequently. Since they are not banned from landfills, computers, cell phones, printers, toasters, coffee pots, and many more devices can be found in the waste stream, with some containing batteries that pose fire and environmental risks. If recycled, precious metals, scrap metal, and rigid plastics can be recovered and diverted from landfills. Residents routinely seek out a permanent collection program to provide ongoing benefits and convenience.

Batteries, especially lithium-ion, are increasingly common in consumer products and pose serious disposal risks. Improperly discarded batteries can ignite fires in collection vehicles, processing facilities, or during shipment, making safe handling and recycling critical. While not quantified in the model, battery collection is a public safety issue that should be addressed to protect people, infrastructure, and the environment.

Mattresses are hard to dispose of, causing illegal dumping and landfill issues due to their bulk and springs. Though Charlevoix County generates only an estimated 14 tons annually, a local recycler (BARC) offers a solution through community partnership that should be explored.

Scrap tires are banned from Michigan landfills but can be recycled into products like rubber mulch, road additives, or energy sources. They are often illegally dumped, creating health risks from mosquito breeding and a public nuisance for public agencies. With no documented scrap tire collection sites in Charlevoix County, periodic collection events are key to safe disposal and environmental protection.

Storm debris can place significant strain on landfill capacity and, depending on the severity of the event, may generate large volumes of material that could be diverted from disposal if adequate infrastructure and systems are in place. RRS recommends integrating disaster debris planning with MMP development, as both rely on the same foundational materials management framework - facilities, collection and processing capacity, transportation logistics, and end markets - though they operate on different timelines. Even without a finalized County or local Disaster Debris Management Plan, the MMP can establish this connection by documenting the core operational elements needed during an emergency.

Commercial recyclables present an opportunity for high volumes of targeted materials to be recovered but services are often limited for commercial routes.

- The 2023 establishment and employment data reinforce several priority opportunities identified in EGLE's MMP guidance. The prominence of Accommodation and Food Services aligns with waste characterization findings that food

waste is one of the largest components of the MCW stream, underscoring the importance of food waste prevention, food rescue, and organics diversion strategies targeted to restaurants, resorts, and institutional food service operations—particularly relevant in a tourism-driven county such as Charlevoix.

- The scale and growth of Manufacturing, Retail Trade, and Construction highlight corrugated cardboard, wood waste, and other packaging and building materials as high-volume, recoverable material streams. These sectors represent a substantial share of total establishments and employment and are well-positioned for targeted commercial recycling initiatives, improved access to recycling services, and coordination with private haulers and construction-related recovery programs.
- Overall, the 2023 establishment and employment data support a planning approach that prioritizes sector-specific strategies, consistent with EGLE's emphasis on focusing resources where they will yield the greatest diversion impact. By aligning program development with Charlevoix County's evolving business profile, the County can more effectively reduce disposal, increase recovery of high-value materials, and advance progress toward its Materials Management Plan goals.

State Landfill Report

The Michigan Department of Environment, Great Lakes, and Energy (EGLE) requires quarterly reporting of all materials landfilled within the state. This reporting, documented through the *Annual Report of Solid Waste Landfilled in Michigan*[1], provides actual data on waste disposed of at Michigan landfills. The dataset includes the total tonnage of waste, identified by county of origin, and classifies materials into broad waste categories.

These categories include **Municipal and Commercial Waste (MCW)**, such as household waste, commercial waste, garbage, regulated medical waste, and municipal solid waste incinerator ash; **Industrial Waste (IW)**, including ashes, auto shredder residue, cement kiln dust, coal ash, food processing residuals, foundry sand, and industrial sludge; **Construction and Demolition (C&D)**, including asbestos waste, scrap wood, and treated or untreated wood; **Other Waste**, such as contaminated soils and technologically enhanced naturally occurring radioactive materials (TENORM); and **Alternative Daily Cover (ADC)**, materials such as chipped tires, ash, foundry sand, sludge, or contaminated soils approved for landfill cover use.

The annual report also includes estimates of remaining landfill capacity. However, it does not account for waste generated in Michigan and disposed of out of state, nor does it provide detailed quantities of specific materials within each category. In addition, the assignment of broad categories (MCW, C&D, ADC, IW, and Other) is not necessarily consistent across the state and may vary by facility and even by individual scale operator. This is particularly relevant for mixed loads that contain multiple material types (e.g., both MCW and C&D), where the total weight of a container or load is typically attributed to a single category, potentially obscuring the true distribution of materials.

[1] https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Legislative/MMD/Part-115/Report-FY24-Landfilled-Solid-Waste.pdf?rev=b1a8a575d427406f8a4ad4fb4de0ff47&hash=430D8389FB9BEE4BA4AA6D076DCC50F7

For this analysis, RRS reviewed EGLE's reported data covering fiscal years 2020 through 2024.

TOTAL TONS LANDFILLED IN MI GENERATED FROM ANTRIM, CHARLEVOIX, MANISTEE, MISSAUKEE AND WEXFORD COUNTIES

Table 1 below presents the aggregated total tons of all material categories (MCW, IW, C&D, ADC, and Other) landfilled in Michigan and attributed to each county in the past fiscal year. It is important to note that these figures represent tonnage as reported. While the data reflects the best available information, it is possible that some materials were reported under incorrect category types or mixed loads were categorized under a single type.

2024	Tons from Charlevoix	242,114.42
2024	Tons from Manistee	93,033.15
2024	Tons from Antrim	78,111.39
2024	Tons from Wexford	58,665.15
2024	Tons from Missaukee	29,706.13

Table 1: Total Tons Landfilled in MI from Each County 2024

CHARLEVOIX COUNTY

TOTAL TONS LANDFILLED BY TYPE

Table 2 below summarizes the types of materials landfilled in Michigan that were attributed to Charlevoix County. Reported disposal tonnages are categorized by material type consistent with state landfill reporting conventions.

Notably, the tonnage of Industrial Waste (IW) reported for 2024 is substantially higher than in prior years, totaling approximately 238,000 tons. This figure represents a significant departure from historical patterns and may reflect a reporting or categorization anomaly, a change in industrial activity during 2024, or a combination of both. When analyzed using a five-year average (2020–2024), the average annual IW disposal attributed to Charlevoix County is approximately 48,000 tons. However, if the 2024 data are excluded, the average IW tonnage reported between 2020 and 2023 drops dramatically to approximately 990 tons per year.

It is also important to consider changes in state reporting requirements that may contribute to this discrepancy. From 2020 through 2022, landfill reporting to the State was required in cubic yards; while beginning in 2023, reporting shifted to tons. For consistency in analysis, reported cubic yards were converted to tons.

In 2024, 238,044 tons were reported by City Environmental Services, Inc of Waters in Crawford County and originating in Charlevoix County. According to the facility's approved operating license[2], allowable ADC sources include industrial byproducts such as ash, sludge, contaminated soils, foundry sand, and automotive shredder residue ("auto fluff"). Approved

[2] https://www.michigan.gov/egle/-/media/Project/Websites/egle/Documents/Programs/MMD/Licenses/MMD/Solid-Waste/City-Environmental-Waters-Landfill.pdf

sources listed in the permit include ash and flakes from Weyerhaeuser; fly ash from Decorative Panels, Inc.; ash from Grayling Generation; contaminated soils from various sources; foundry sand from East Jordan Iron Works / EJ USA Inc.; and auto fluff from A&L Iron. While sludge from Great Lakes Tissue is also listed as an approved source, that facility ceased operations following a fire in 2023 and is therefore unlikely to have contributed to 2024 disposal volumes.

The acceptance of these industrial materials as ADC may have resulted in large volumes being reported as industrial waste attributable to Charlevoix County in 2024, even in the absence of a corresponding increase in local industrial generation. This regulatory context should be considered when interpreting the 2024 IW data and comparing it to historical trends. To illustrate the impact of the significant increase in IW documented in 2024, RRS calculated the average percentage of each waste type for two periods: 2020–2023 and 2020–2024. Without 2024 data, IW accounts for only 8% of total waste; when 2024 is included, IW jumps to 83%, as shown in Table 2.

REPORTED LANDFILL WASTE TYPE, TONS[3]	2020	2021	2022	2023	2024	*AVERAGE 2020 - 2024*	*% TOTAL AVERAGE 2020 - 2024*	*AVERAGE 2020-2023*	*% TOTAL AVERAGE 2020 - 2023*
ADC	40	-	-	-	-	***8***	*0.01%*	***10***	*0.08%*
C&D	2,259	2,868	2,015	8,666	1,251	***3,412***	*5.86%*	***3,952***	*32.40%*
IW	2,741	457	420	341	238,044	***48,401***	*83.19%*	***990***	*8.11%*
MCW	6,914	3,215	2,656	2,445	2,559	***3,558***	*6.11%*	***3,807***	*31.22%*
OTHER	705	3,303	8,824	920	260	***2,802***	*4.82%*	***3,438***	*28.19%*
Grand Total	**12,658**	**9,842**	**13,915**	**12,371**	**242,114**	***58,180***		***12,197***	

Table 2: Michigan Landfill Waste Generated by Charlevoix County by Type 2020 – 2024

[3] Fiscal years 2020 – 2022 were reported in cubic yards, converted to tons using: MCW = 3 cy : 1 ton, C&D = 2 cy : 1 ton, ADC, IW, OTHER all 1 cy = 1 ton.

MICHIGAN LANDFILL WASTE GENERATED BY CHARLEVOIX COUNTY BY TYPE IN TONS 2020-2024

Figure 1 below illustrates the reported annual tons of landfilled material, by type, attributed to Charlevoix County on average from 2020–2024. The average total tonnage per year is 55,505 tons, of which approximately **43%** is Municipal and Commercial Waste (MCW). According to demographic data provided by Networks Northwest, originally sourced from the American Community Survey, Charlevoix County had an estimated population of 26,143 in 2023. This corresponds to an estimated **MCW disposal rate of approximately 0.7 pounds per person per day** based on the five-year average reported tonnage.

This is an unusually low MCW disposal rate on a per-capita basis. For comparison, the statewide average reported by EGLE is **4.64 pounds per person per day**. An unusually low per-capita MCW rate may indicate that a portion of Charlevoix County's MCW is being managed outside of the tonnage attributed to the county in the landfill report. For example, waste generated in the county but disposed at facilities that may be attributed to another county, or disposed through non-landfill pathways that are not captured in the reported landfilled tonnage (illegal burning or dumping). It may also reflect inconsistencies in landfill reporting and categorization practices (e.g., MCW being recorded under another category such as Industrial Waste or C&D). Finally, it is possible that the reported figure accurately reflects atypical disposal dynamics during the analysis period, though additional data and verification would be required to confirm this.

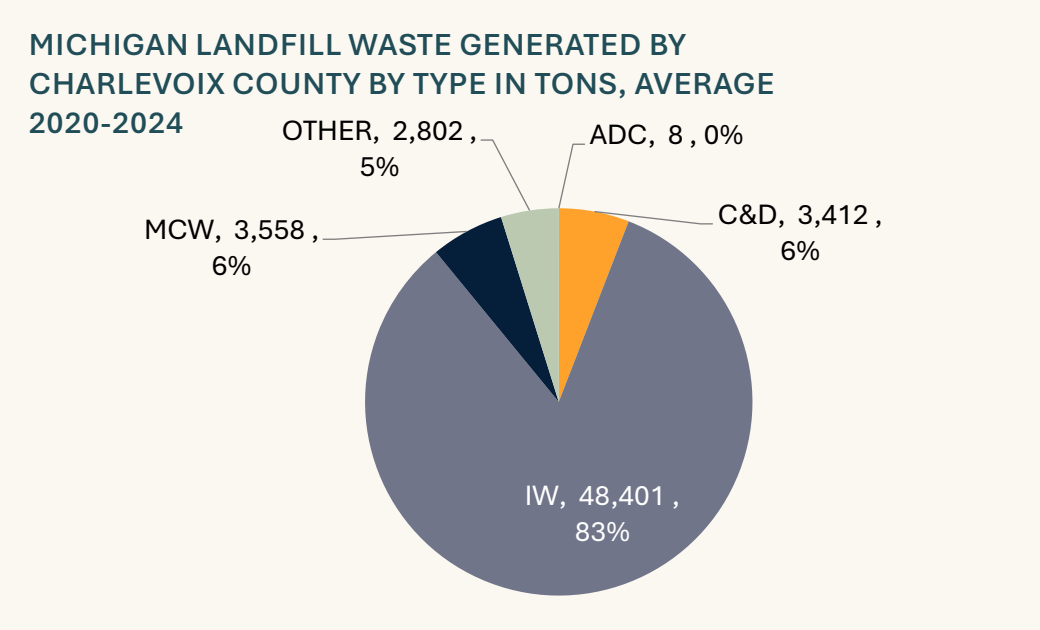


Figure 1: Michigan Landfill Waste Generated by Charlevoix County by Type in Tons, Average 2020 – 2024

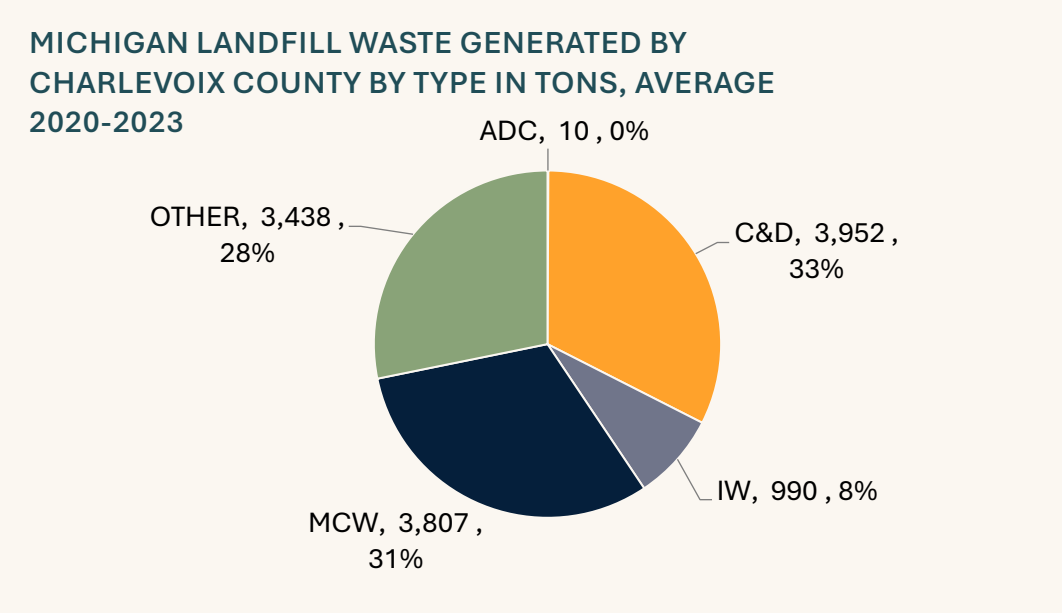


Figure 2: Michigan Landfill Waste Generated by Charlevoix County by Type in Tons, Average 2020 - 2023

DISPOSAL FACILITIES RECEIVING LANDFILLED MATERIAL FROM CHARLEVOIX COUNTY IN FY 2024

Table 3 presents information on landfill capacity at each location, reported in cubic yards. The remaining years of capacity are presented as a range for each facility: one value is self-reported by the landfills, and the other is calculated by EGLE by dividing the remaining capacity by the amount of capacity used in FY 2024. Differences between these two values account for the range in remaining years of capacity shown in the table.

Landfills Receiving Waste from Charlevoix County 2024					
	Tons	**City Environmental Services, Inc of Waters (Crawford County)**	**GFL North Michigan Landfill, LLC (Presque Isle County)**	**Montmorency-Oscoda-Alpena SWMA (Montmorency County)**	**Wexford County Landfill (Wexford County)**
ADC	-	-	-	-	-
C&D	1,251	1,045	192	-	15
IW	238,044	238,044	-	-	-

MCW	2,559	2,512	9	38	-
OTHER	260	194	-	-	67
Grand Total	**242,114**	**241,794**	**201**	**38**	**82**

Table 3: Landfills Receiving Waste from Charlevoix County in 2024

	City Environmental Services, Inc of Waters (Crawford County) (City Environmental Services, Inc of Water)	GFL North Michigan Landfill, LLC (Presque Isle County)	Montmorency-Oscoda-Alpena SWMA (Montmorency County)	Wexford County Landfill (Wexford County)
Remaining Capacity (CY)	17,590,764	871,763	1,517,378	15,820,706
Capacity Used in 2024 (CY)	54,650	111,477	91,437	366,293
Est Years of Remaining Capacity	321 - 322	8 -9	17	43 - 46

Table 4: Estimated Landfill Capacity 2024

RRS MCW Modeling

The RRS Municipal and Commercial Waste (MCW) Characterization Model is designed to identify potential recovery opportunities within the MCW stream, broken down by specific material types and generating sectors, including single-family residential, multi-family residential, and commercial sources. The model was developed using multiple waste characterization and capture rate studies conducted over the past five years, including studies specific to Michigan as well as broader research from the Midwestern United States. This model is intended as a planning tool to help the County understand which specific materials are being landfilled within the MCW stream, thereby identifying the greatest opportunities and potential tons available for recovery.

The model estimates the composition of MCW by dividing it into approximately 50 distinct material categories, expressed as percentages of the total waste stream. **For most counties where the reported MCW disposal tonnage is considered reliable, these percentages can then be applied directly to the county' s reported MCW tonnage to estimate the tons of each material category being landfilled.** However, because Charlevoix County's reported MCW tonnage is unusually low and cannot be confirmed as representative of actual conditions, **RRS applied the characterization model to an alternative baseline: the amount of MCW Charlevoix County would be expected to generate if it were disposing waste at the Michigan statewide average per-capita rate.** This approach supports planning by providing a more reasonable estimate of landfilled material composition and recoverable tonnage in the absence of verified local disposal reporting.

In addition, the model uses aggregated data to differentiate between waste generated by commercial businesses and residential sources. Within the residential sector, housing data from the 2020 U.S. Census is incorporated to allocate tonnages between single-family and multi-family residences.

The approximately 50 material categories were also ranked according to their ease of recovery. The rankings are as follows:

1. **Readily Recyclable** – materials that are almost universally accepted in existing curbside recycling programs. Examples include cardboard, plastics #1-2, aluminum cans.

2. **Compostable** – materials that break down naturally, including food waste, yard waste, brush, and leaves.

3. **Recyclability Variable by Municipality** – materials that are sometimes accepted in established curbside recycling programs. Examples include HHW, plastic films, textiles.

4. **Minimal Access for Recycling/Specialty Recycling** – materials that may be recyclable through drop-off or specialized programs, such as bulky waste, tires, and polystyrene.

5. **Not Recyclable** – materials that are currently not recyclable through existing programs.

Based on this assessment, RRS estimates that approximately 54% of landfilled MCW by weight from Charlevoix County is either readily recyclable or compostable. This approach provides a detailed, data-driven foundation for evaluating material-specific recovery potential and informing county-level planning efforts.

RRS LANDFILLED MCW RECYCLABILITY MODEL BY WEIGHT IN TONS

Figure 3 below illustrates the recyclability of municipal and commercial waste (MCW) by weight for materials currently landfilled, based on an estimated MCW tonnage of 23,733; the amount of MCW Charlevoix County would be expected to generate if it were disposing waste at the Michigan statewide average per-capita rate. It highlights the potential opportunities to divert waste from landfill toward higher-value outcomes, such as established recycling programs or composting initiatives.

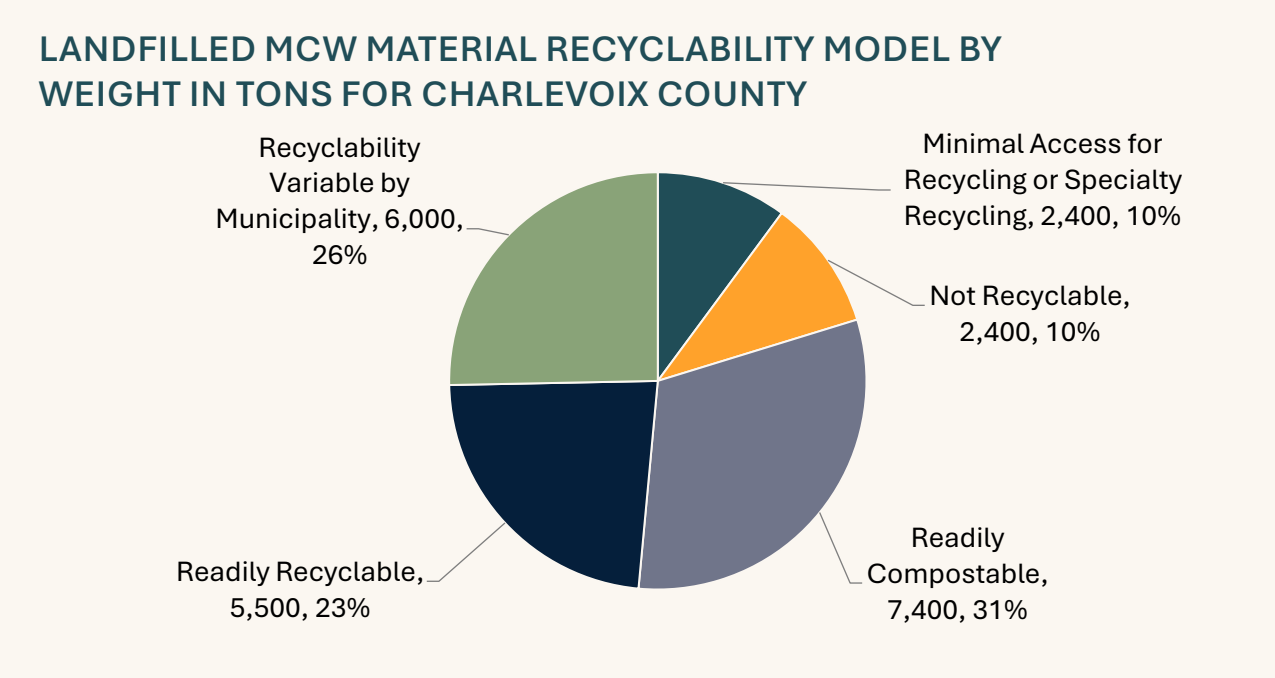


Figure 3: RRS Model, Landfilled MCW Recyclability by Weight in Tons

RRS MCW COMPOSITION MODEL BY WEIGHT

Figure 4 below outlines the 25 most prevalent materials within the MCW stream by weight, as identified by the RRS model. It also illustrates the proportional generation of each material by single-family households, multi-family households, and the commercial sector. The tonnage and relative proportions of these materials provide valuable insights for planners to target key materials for diversion efforts as discussed previously in the Preliminary Opportunities section. Clearly, wasted food represents a significant opportunity to both increase diversion and reduce overall waste through food rescue and composting. In addition, the large quantity of compostable paper further increases the potential feedstock for expanded composting infrastructure. The model also indicates a strong potential to increase recovery of corrugated cardboard and plastic films, particularly within the commercial sector, where these materials represent a larger share of total generation. Textile waste also represents a significant tonnage and therefore presents an opportunity to expand or encourage textile reuse and donation outlets within the county.

A full depiction of all 50+ materials and their anticipated composition in the waste composition model can be found in the Appendix.

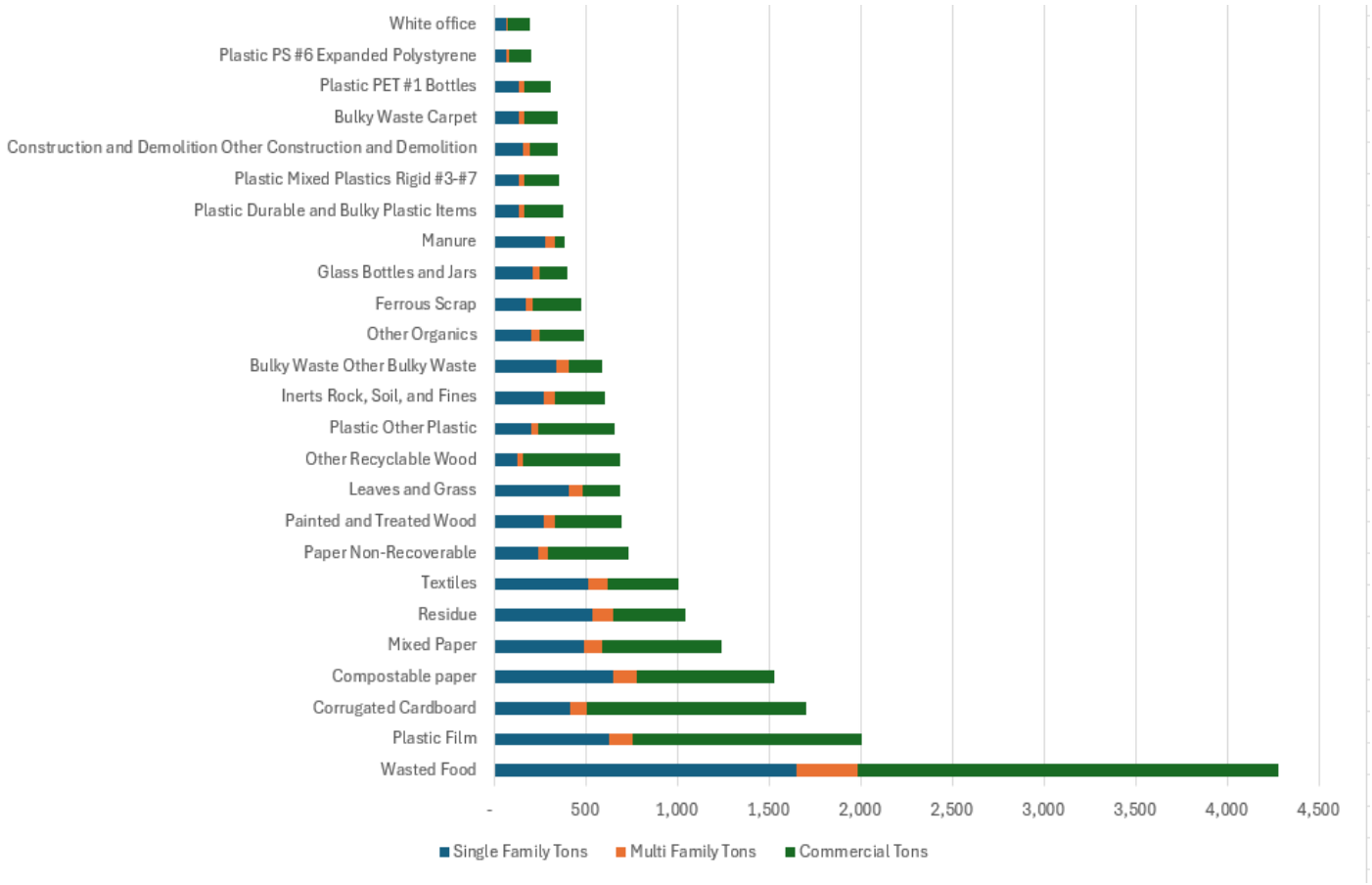


Figure 4: RRS Modeled MCW Composition by Weight

POTENTIAL ECONOMIC OPPORTUNITY

When approached strategically, materials management plans present significant economic opportunities for the county. Recovered materials, often considered "waste," can be valuable resources when properly sorted and processed, serving as key inputs for various industries, such as East Jordan Iron Works or St. Mary's Cement. The following table illustrates the potential economic value of materials currently being landfilled by residents and businesses in Charlevoix County. It provides a breakdown of reported MCW tonnage into specific material categories, based on the RRS model. Additionally, commodity values for each material were sourced from Recyclingmarkets.net, a trusted industry resource, to demonstrate the potential value of these landfilled materials if they were properly captured, sorted, and prepared for market (e.g., baled). While this analysis serves as an illustration of potential value, it is recognized that achieving a 100% capture rate for all landfilled recyclables is unlikely. Furthermore, the snap-shot values presented reflect a relatively low commodities market, so the estimated value should be considered somewhat conservative. **Even under these conservative assumptions, the analysis indicates that more than $200,000 in "Readily Recyclable" materials from Charlevoix County are likely landfilled each year.**

Type Modeled	Ease of Recoverability	Total Tons	Recyclingmarkets.net value 9.15.25	Est Market Value of Tons
Corrugated Cardboard	Readily Recyclable	1,708	$ 65.00	$ 110,988
Mixed Paper	Readily Recyclable	1,243	$ 35.00	$ 43,503
Steel Cans	Readily Recyclable	158	$ 160.00	$ 25,330
White office	Readily Recyclable	194	$ 125.00	$ 24,197
Aluminum Cans	Readily Recyclable	136	$ 80.00	$ 10,848
Magazines	Readily Recyclable	168	$ 35.00	$ 5,865
Newspaper (ONP)	Readily Recyclable	139	$ 35.00	$ 4,875
Plastic HDPE #2 Bottles Natural	Readily Recyclable	98	$ 46.00	$ 4,528
Plastic PET #1 Bottles	Readily Recyclable	311	$ 5.75	$ 1,787
Paperboard Boxboard	Readily Recyclable	45	$ 35.00	$ 1,564
Plastic PET #1 Non-Bottle	Readily Recyclable	71	$ 5.75	$ 411
Plastic HDPE #2 Bottles colored	Readily Recyclable	106	$ 2.50	$ 266
Plastic HDPE #2 Non-Bottle colored and natural combined	Readily Recyclable	6	$ 0.50	$ 3
				$ 234,165
Plastic Film	Recyclability Variable by Municipality	2,005	$ 1.00	$ 2,005
Plastic PP#5	Recyclability Variable by Municipality	116	$ 7.50	$ 870
Plastic Mixed Plastics Rigid #3-#7	Recyclability Variable by Municipality	355	$ 1.50	$ 533
				$ 3,408
				$ 237,573

Figure 5: Example Recycling Market Values for 9.15.2025

Organic Material

Organic materials, including food scraps, edible surplus food, leaves, grass clippings, brush, and other yard debris, represent a significant and recoverable portion of the municipal solid waste stream in Charlevoix County. Consistent with Michigan law, yard clippings are prohibited from disposal in landfills (Part 115 of NREPA)[4], and communities across the county provide a mix of municipal collection and drop-off options to manage these materials outside of the landfill.

[4] https://legislature.mi.gov/Laws/MCL?objectName=mcl-324-11514&utm

At the municipal level, the **City of Charlevoix**[5], **City of East Jordan**[6], and **Boyne City**[7] all provide **seasonal curbside yard waste collection** programs for residents, as documented on their respective Department of Public Works and public services webpages. The **City of Charlevoix** operates a municipal composting program and reports that it collects an **average of approximately 369 tons of compostable material per year**, based on self-reported data from the City's Department of Public Works. This program represents one of the most established municipal organics recovery efforts within the county.

In addition, **East Jordan** provides a **dedicated compost drop-off area** for food waste and yard waste (excluding brush). This site is located behind the EMS building across from Save-A-Lot at 107 Bartlett Street, adjacent to the county recycling bins. Information on this site is provided through Charlevoix County recycling and East Jordan municipal resources.

Together, these municipal programs form the core of Charlevoix County's current organics management system. While these services demonstrate existing commitment and infrastructure for organic material diversion, available tonnage data are limited outside of the City of Charlevoix program. As a result, countywide organics diversion must be evaluated using a combination of reported municipal data and regional modeling, as described in the following section.

SEEDS ORGANICS ANALYSIS

A 2021 report[8] prepared by RRS and commissioned by SEEDS Ecology & Education Centers and funded with a 2021 EGLE Market Development Grant, evaluated current prevention, rescue/recovery and recycling processing opportunities and applied feasibility of each option to each county in the region and modeled centralized composting and operating costs and a preliminary collection and transportation plan. It also projected GHG emission savings and job creation and identified actionable next steps for the region to support the organics circular economy. The study concluded that Charlevoix County generated an estimated 6,687 tons of organic waste per year with approximately 1,286 tons diverted to permitted composting sites annually. Based on RRS's current model of landfilled MCW and the state average MCW tons for the county, in 2024 RRS estimates that Charlevoix County generated approximately 7,300 tons of organic waste that was landfilled. **For planning purposes, Charlevoix County should estimate 6,600 – 7,300 tons of organic waste generated (food scraps, yard waste, brush, leaves, branches and trimmings) annually.**

SEEDS REPORT ESTIMATED ORGANICS GENERATION AND DIVERSION 2021

Figure 6 below summarizes the ten counties analyzed, showing their estimated annual generation of organic waste (food and yard waste) in tons, the amount currently diverted, and the additional tonnage that could potentially be diverted through various methods. If all identified strategies were implemented, Charlevoix County's overall organics diversion rate would reach 29%. The 2021 study noted that Antrim, Benzie, Charlevoix, Kalkaska, Manistee and Missaukee counties all have s relatively small

[5] https://www.charlevoixmi.gov/DocumentCenter/View/152/Brush-Pickup-PDF

[6] https://www.eastjordancity.org/news_detail_T4_R13.php

[7] https://www.boynecity.gov/services/public_works/leaf_yard_waste.php

[8] https://michiganrecycles.org/wp-content/uploads/2022/08/RRS-FINAL-REVISED-NW-Lower-MI-Regional-Organics-Strategy-Report.pdf

amount of organics collection and recommended that these counties focus efforts on food rescue initiatives (recovering edible food before disposal), education on food waste reduction, and promotion of backyard composting practices. Furthermore, the study identified the close proximity to large scale composting operations in Emmet County could present an opportunity for increased organics collection. At the time, it was estimated that ~ 855 tons of food waste is generated per year from food stores within the county, ~381 tons per year from food processing operations and ~87 tons per year of food waste from bars and restaurants.

ANNUAL TONS YARD AND FOOD WASTE

COUNTY	Generation	Current Diversion*	Estimated Potential Diversion					
			Prevention	Rescue/ Recovery	Recycle**	Centralized Composting	Tons Diversion	Percent Diversion
Antrim County	6,149	41	81	39	345	935	1,400	22.8%
Benzie County	5,101	108	62	30	360	686	1,138	22.3%
Charlevoix County	6,687	1,286	91	44	387	1,415	1,937	29.0%
Emmet County	8,006	1,048	236	127	678	2,806	3,847	48.0%
Grand Traverse County	19,074	4,003	319	302	1,551	8,301	10,473	54.9%
Kalkaska County	5,114	14	61	30	229	721	1,041	20.4%
Leelanau County	5,850	751	76	36	447	861	1,420	24.3%
Manistee County	6,366	421	85	41	321	992	1,438	22.6%
Missaukee County	4,608	1	52	25	194	561	832	18.1%
Wexford County	8,035	77	115	56	547	1,789	2,507	31.2%
TOTAL	**74,989**	**7,750**	**1,179**	**729**	**5,060**	**19,066**	**26,034**	**34.7%**

*Current Diversion tonnage is estimated based on 2021 survey data and 2019 EGLE Waste Data System (WDS) of reported volumes to permitted composting sites.
**Recycle includes backyard composting, community composting and animal feed. The estimated diversion by sub-category is included in the appendix.

Figure 6: Potential Organic Tonnage, SEEDS 2021

Demographic Data & Waste Generation

MCW GENERATION PROJECTIONS

Networks Northwest provided RRS with county-level demographic data obtained from the American Community Survey the Bureau of Labor Statistics, and the Michigan Department of Technology, Management & Budget. These datasets include projected five-year population estimates through 2050.

To help Charlevoix County plan for potential future MCW tonnages, RRS modeled three generation scenarios, Low, Medium, and High, reflecting the uncertainty in MCW generation data as reflected in current reporting systems:

- **Low Projection (0.75 lbs/person/day):** Based on the MCW tonnage reported for Charlevoix County from 2020–2024, this rate likely understates actual generation and is included to represent the lower bound of the projected range.
- **High Projection (4.64 lbs/person/day):** Based on EGLE's publicized statewide average MCW generation rate[9], this figure represents the upper bound and may more closely reflect actual disposal activity across Michigan.
- **Medium Projection (2.67 lbs/person/day):** Representing the median of the Low and High figures, this scenario offers a middle-ground estimate for planning purposes.

Table 5 below applies each of these three per capita MCW disposal rates to the county's projected population through 2050 to illustrate the potential range of MCW volumes the county may need to manage in the coming decades.

YEAR	PROJECTED COUNTY POPULATION	LOW ANNUAL MCW TONS AT 0.75 LBS/PP/DAY	MEDIUM ANNUAL MCW TONS AT 2.7 LBS/PP/DAY	HIGH ANNUAL MCW TONS AT 4.6 LBS/PP/DAY
2025	26,248	3,593	12,934	22,138
2030	26,260	3,594	12,940	22,227
2035	25,980	3,556	12,802	22,237
2040	25,368	3,472	12,500	22,000
2045	24,391	3,339	12,019	21,482
2050	23,441	3,208	11,551	20,654

Table 5: RRS Potential MCW Tonnage Projections

It should be understood that per capita generation rate is one of many data points the County should consider throughout the Materials Management Plan (MMP) process. Per capita generation is inherently tied to the number of permanent residents, as measured by occupied housing units reflected in U.S. Census data. Charlevoix County, like many northern Michigan counties, experiences significant population influxes during peak tourism seasons. These seasonal surges meaningfully impact waste generation volumes but are not easily captured in a per capita rate, as the additional temporary population, including tourists and occupants of secondary or seasonal homes, is not reflected in permanent resident counts. This limitation should be kept in mind when interpreting the projections above and when developing waste management strategies for the county.

BUSINESS SECTOR DEMOGRAPHICS

Detailed business establishment and employment data for **2018 and 2023**, provided by Networks Northwest and originally sourced from Esri, further refine the understanding of Charlevoix County's commercial landscape and its implications for materials management planning. These data form the basis for Figure 7, Figure 8, and Figure 9 and highlight both growth trends

[9] https://www.michigan.gov/-/media/Project/Websites/egle/Documents/Programs/MMD/Recycling/MMP-Goals-MRC-Presentation-Slides.pdf

and sector-specific recovery opportunities. The full 2018 and 2023 establishment and employment datasets are provided in the appendix.

Between 2018 and 2023, Charlevoix County experienced notable growth in the number of business establishments, particularly in sectors associated with higher waste generation and recoverable materials. **Construction** increased from **117 to 146 establishments**, **Retail Trade** from **114 to 120**, **Accommodation and Food Services** from **79 to 97**, and **Health Care and Social Assistance** from **55 to 87** establishments. Growth was also observed in **Manufacturing** (45 to 57 establishments), **Professional, Scientific, and Technical Services** (44 to 68), and **Administrative Support and Waste Management Services** (53 to 57). These trends indicate a growing and diversifying commercial base with direct implications for both MCW generation and diversion potential.

Employment data further clarify where material recovery efforts may be most impactful. In **2023**, the largest employment sectors in Charlevoix County were **Manufacturing (2,874 jobs)**, **Accommodation and Food Services (1,838 jobs)**, **Health Care and Social Assistance (1,422 jobs)**, and **Retail Trade (879 jobs)**. Employment growth was particularly strong in **Manufacturing** (2,451 to 2,874 jobs), **Administrative Support and Waste Management Services** (253 to 302 jobs), **Wholesale Trade** (53 to 110 jobs), and **Utilities** (148 to 197 jobs).

From a materials management perspective, these 2023 data reinforce several priority opportunities identified in EGLE's MMP guidance. The prominence of Accommodation and Food Services aligns with waste characterization findings that food waste is one of the largest components of the MCW stream, underscoring the importance of **food waste prevention, food rescue, and organics diversion strategies** targeted to restaurants, resorts, and institutional food service operations—particularly relevant in a tourism-driven county such as Charlevoix.

Similarly, the scale and growth of Manufacturing, Retail Trade, and Construction highlight **corrugated cardboard**, **wood waste**, and other packaging and building materials as high-volume, recoverable material streams. These sectors represent a substantial share of total establishments and employment and are well-positioned for targeted commercial recycling initiatives, improved access to recycling services, and coordination with private haulers and construction-related recovery programs.

Overall, the 2023 establishment and employment data support a planning approach that prioritizes sector-specific strategies, consistent with EGLE's emphasis on focusing resources where they will yield the greatest diversion impact. By aligning program development with Charlevoix County's evolving business profile, the County can more effectively reduce disposal, increase recovery of high-value materials, and advance progress toward its Materials Management Plan goals.

Figure 7: Industry and Employment Statistics, Courtesy Networks Northwest

CHARLEVOIX COUNTY BUSINESS SECTORS BY NAICS CODES (# OF ESTABLISHMENTS) 2023

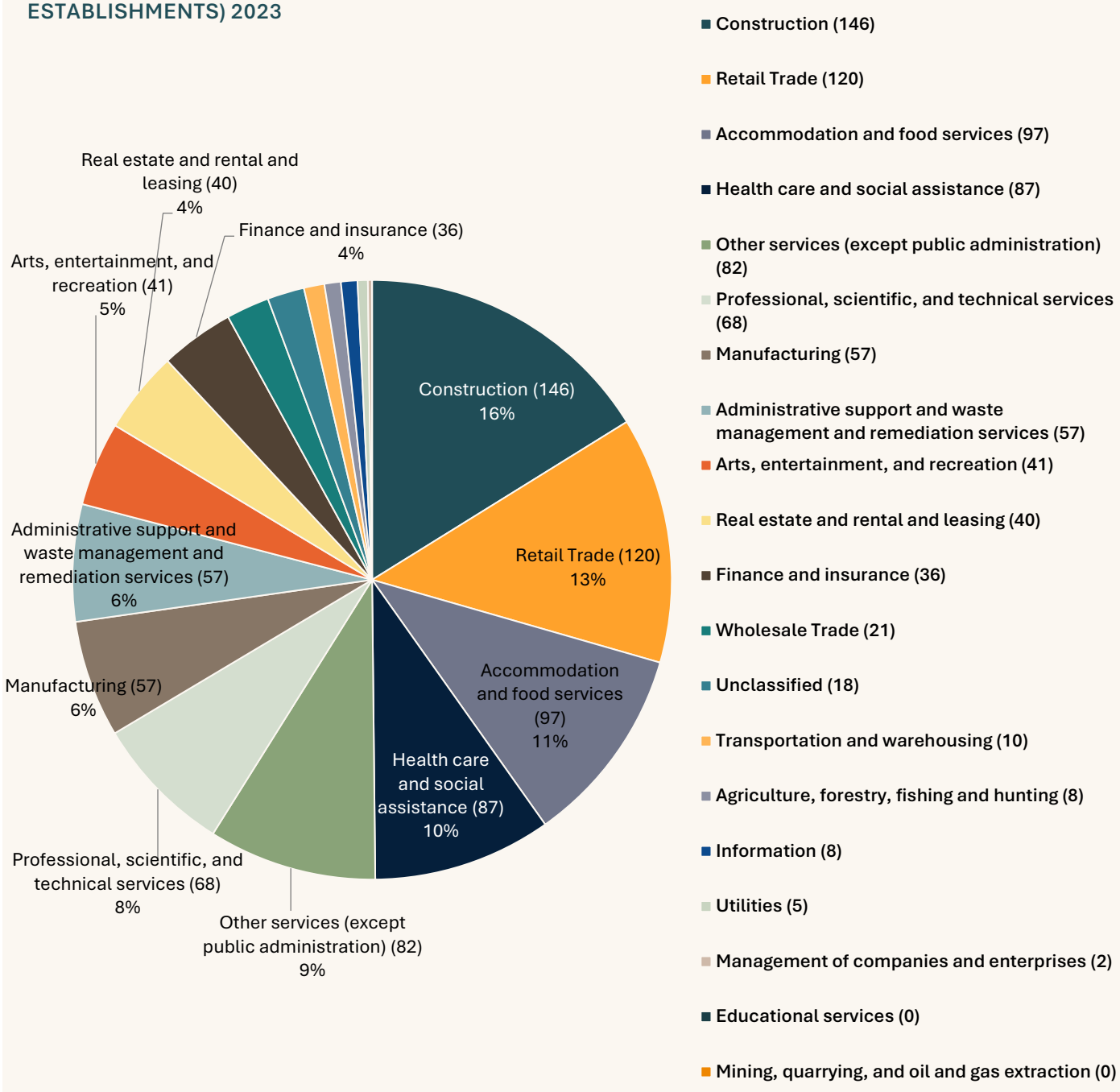


Figure 8: Charlevoix County Business Sectors by NAICS Code, # of Establishments. Data provided by Networks Northwest

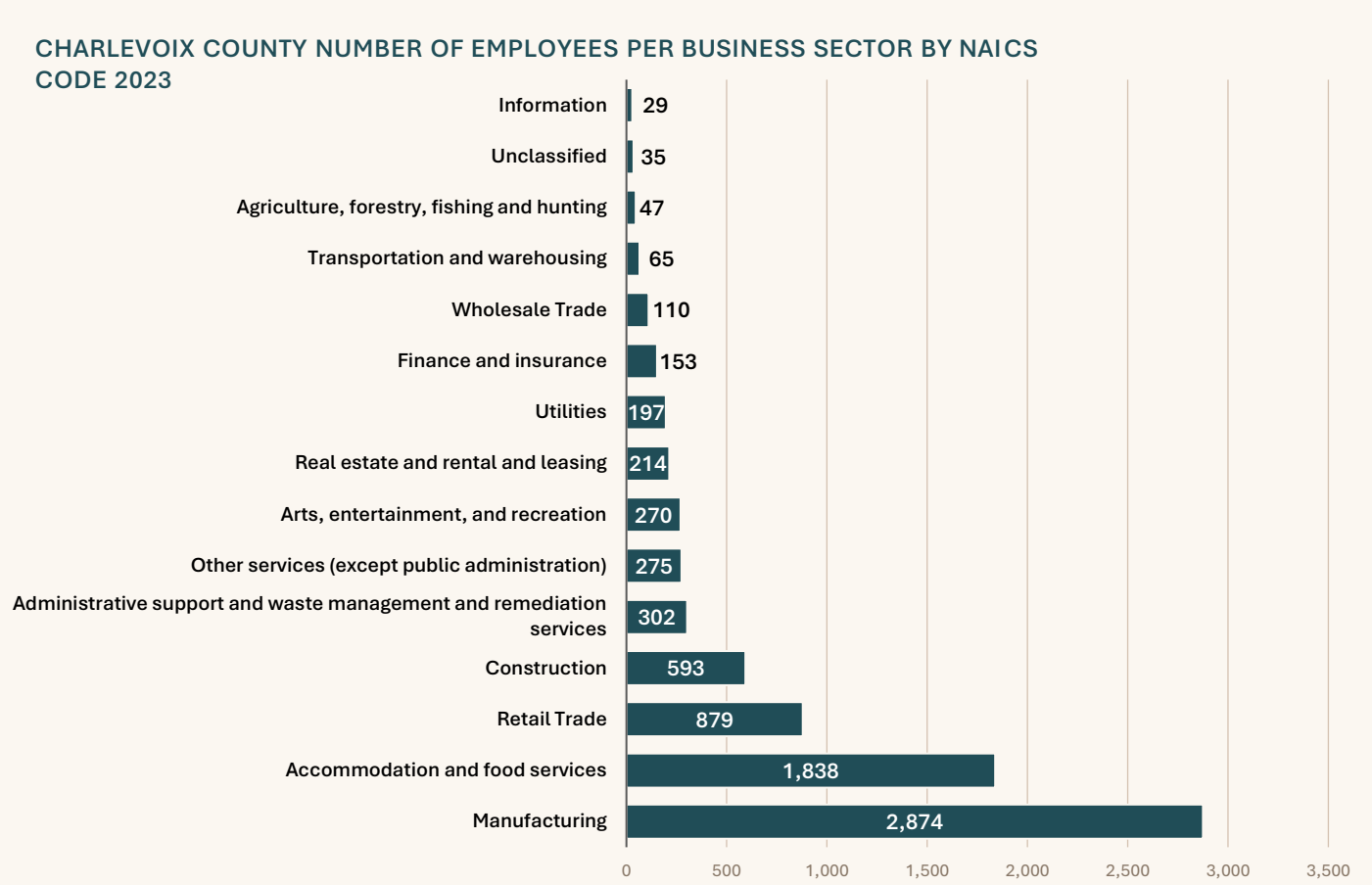


Figure 9: Charlevoix County # of Employees by NAICS Code, 2023. Data provided by Networks Northwest

Compliance with Part 115 and Benchmark Recycling Standards

Charlevoix County is in compliance with Michigan's Part 115 Benchmark Recycling Standards, which are designed to ensure that counties provide convenient and accessible recycling opportunities for residents and businesses in support of the state's broader recycling goals. Because Charlevoix County does not contain any urbanized areas or communities with populations exceeding 5,000 residents, the first two benchmark standards do not apply.

Currently, there are no municipal or municipally contracted curbside recycling programs operating within the county. However, many residents may be able to subscribe directly with private waste haulers for curbside recycling services on an individual basis. Charlevoix County's recycling program consists of drop-off sites managed by Charlevoix County. The drop-off locations include:

- **Beaver Island Transfer Station**– 36770 East Side Drive

- **Boyne City** – East of Charlevoix County Road Commission, off Beardsley Street
- **Boyne Valley Township** – Addis Road, West of US 131
- **Charlevoix Location** – next to the County Sheriff's Office / County Jail, 1030 Grant St, Charlevoix
- **East Joran Location**– behind the EMS building across from Save-A-Lot, 107 Bartlett St.
- **Melrose Township Transfer Station**– State St, west of Clarion Village, across from the Marathon Station

Drop-off locations provide access to recycling receptacles for paper, cardboard, glass, plastic bottles and jugs, metal cans, and even plastic films[10]. Locations have varying hours, but with six drop-off sites, the county exceeds the **Benchmark Recycling Standard** for drop-off access. Definitions of the Benchmark Recycling Standards are listed in the Appendix.

CURBSIDE SERVICE TYPES

More broadly, curbside waste, recycling, and organics/yard waste collection programs can be categorized as:

1. **Municipal** – municipal staff collect material using municipal equipment.
2. **Contracted or franchised** – a municipality contracts with a single hauler to provide curbside service to all residents (funded through a variety of approaches, such as general funds, special assessments, utility-style fees, or billed service fees).
3. **Subscription (open-market)** – residents contract directly with the hauler of their choice for curbside services.
4. **No curbside program** – there is no verified curbside service being actively provided within the municipality (regardless of cost).

EGLE instructs counties to calculate curbside recycling access according to this formula:

$$\text{Curbside Recycling Access} = \frac{\text{Sum of single family dwellings which have curbside recycling access}}{\text{Total number of single family dwellings}} \times 100$$

Currently, there are no municipal or municipally contracted recycling programs operating within the county. However, some residents may be able to subscribe directly to curbside recycling service through private waste haulers on an individual basis.

[10] https://cms2.revize.com/revize/countyofcharlevoix/SSR%20List.pdf

Table 6 below does not list any communities under 'Subscription' because there are no publicly confirmed haulers documented as providing curbside recycling services in those areas.

Importantly, Part 115's benchmark recycling standards treat subscription/open-market service as "access" for purposes of curbside recycling. Specifically, the statute provides that curbside recycling qualifies when: "The curbside recycling is provided by the municipality or the resident has access to curbside recycling by the resident's chosen hauler."[11]

At the same time, the statutory "access" language does not specify that subscription/open-market service must be affordable (e.g., it does not define an acceptable price, require rate caps, or require that service be provided at no additional cost). As a result, a community may be counted as having "access" through subscription service even if cost remains a practical barrier for some households.

RECYCLING AND COMPOSTING ACCESS IN CHARLEVOIX COUNTY

As noted previously, there are no confirmed haulers offering subscription-based curbside recycling service, and there are no municipally managed curbside recycling programs for traditional recyclables (packaging). However, there are three known municipal curbside collection programs for yard waste, located in **Boyne City, Charlevoix City** and **East Jordan City**. Table 6 below provides a summary by community.

SUMMARY TABLE OF RECYCLING ACCESS BY COMMUNITY

COMMUNITY NAME	2020 CENSUS NAME	COMMUNITY POPULATION	# OF HOUSE HOLDS	POPULATION IN SINGLE FAMILY HOMES[12]	POPULATION IN MULTI FAMILY HOMES[13]	RECYCLE CURB SIDESIDE SERVICE TYPE	RECYCLING DROP-OFF PROGRAM
Bay Township	Horton Bay CDP Bay Township	1141	485	1141	0	No Curbside Program	Charlevoix County Drop-Off Program
Boyne City	Boyne City	3817	1687	3172	645	No Curbside Program	Charlevoix County Drop-Off Program
Boyne Valley Township	Boyne Falls Village	357	172	315	42	No Curbside Program	Charlevoix County Drop-Off Program
Boyne Valley Township	Boyne Valley Township	1067	413	1033	34	No Curbside Program	Charlevoix County Drop-Off Program
Chandler Township	Chandler Township	284	113	281	3	No Curbside Program	Charlevoix County Drop-Off Program
Charlevoix City	Charlevoix City	2349	1252	1735	614	No Curbside Program	Charlevoix County Drop-Off Program
Charlevoix Township	Charlevoix Township	1763	771	1730	33	No Curbside Program	Charlevoix County Drop-Off Program

[11] https://www.legislature.mi.gov/documents/mcl/pdf/mcl-451-1994-ii-3-115.pdf

[12] Single Family = 1-4 units, mobile homes and other types of housing.

[13] Multi-Family = 5 or more units.

East Jordan City	East Jordan City	2240	947	1975	265	No Curbside Program	Charlevoix County Drop-Off Program
Evangeline Township	Evangeline Township	767	318	767	0	No Curbside Program	Charlevoix County Drop-Off Program
Eveline Township	Advance CDP Ironton CDP Eveline Township	1515	663	1503	12	No Curbside Program	Charlevoix County Drop-Off Program
Hayes Township	Bay Shore CDP (1 of 2) Hayes township	2001	861	2001	0	No Curbside Program	Charlevoix County Drop-Off Program
Hudson Township	Hudson Township	670	285	670	0	No Curbside Program	Charlevoix County Drop-Off Program
Marion Township	Marion Township	1657	666	1628	29	No Curbside Program	Charlevoix County Drop-Off Program
Melrose Township	Melrose Township Walloon Lake CDP	1405	585	1368	37	No Curbside Program	Charlevoix County Drop-Off Program
Norwood Township	Norwood CDP Norwood township	700	313	700	0	No Curbside Program	Charlevoix County Drop-Off Program
Peaine Township	Peaine Township	266	141	262	4	No Curbside Program	Charlevoix County Drop-Off Program
South Arm Township	South Arm Township	1941	741	1913	28	No Curbside Program	Charlevoix County Drop-Off Program
St. James Township	St. James Township St. James CDP	260	136	260	0	No Curbside Program	Charlevoix County Drop-Off Program
Wilson Township	Wilson Township	1858	727	1858	0	No Curbside Program	Charlevoix County Drop-Off Program

Table 6: Summary of Recycling Access by Community

Data Currently Available

Recycling

Charlevoix County has provided recycling tonnage data spanning 2017 through 2025, representing all recyclables collected and hauled through the County's managed recycling program. This program encompasses drop-off bins distributed throughout the county. RRS initially received annual recycling tonnage data, summarized in the bar chart below, followed by more granular monthly tonnage data presented in the line graph. Together, these two datasets provide both a long-term trend perspective and a detailed view of seasonal variation in recycling activity.

The annual data for 2022–2024 is summarized in Table 7 below. In 2022 and 2023, the County reported residential drop-off tonnages of 2,200 and 2,683 tons, respectively. In 2024, single-stream residential drop-off tonnage was reported at 2,475 tons. That same year, the County also reported **80.9 tons of material collected through Household Hazardous Waste (HHW) events and 206 scrap tires**, which are collected on an alternating-year basis when funding is available. Collected materials were processed through a combination of facilities and service providers, which expanded over this period to include GFL Environmental (Grand Traverse County), ERG Environmental Services, Bay Area Recycling for Community (BARC), East Jordan Auto Parts, and Environmental Rubber Recycling.

CHARLEVOIX COUNTY FISCAL YEAR ANNUAL DROP-OFF RECYCLING TONNAGES	2022	2023	2024
Residential Drop Off Tons	2,200.00	2,682.97	
Single Stream Residential Drop Off Tons			2,474.55
HHW Events Tons			80.91
Scrap Tires, collected every-other-year			206.25
Final Destination	GFL Grand Traverse	GFL Grand Traverse, ERG Environmental Services, BARC, East Jordan Auto Parts	GFL Grand Traverse, ERG Environmental Services, BARC, East Jordan Auto Parts, Environmental Rubber Recycling

Table 7: Charlevoix County Reported Drop-Off Recycling Tonnages

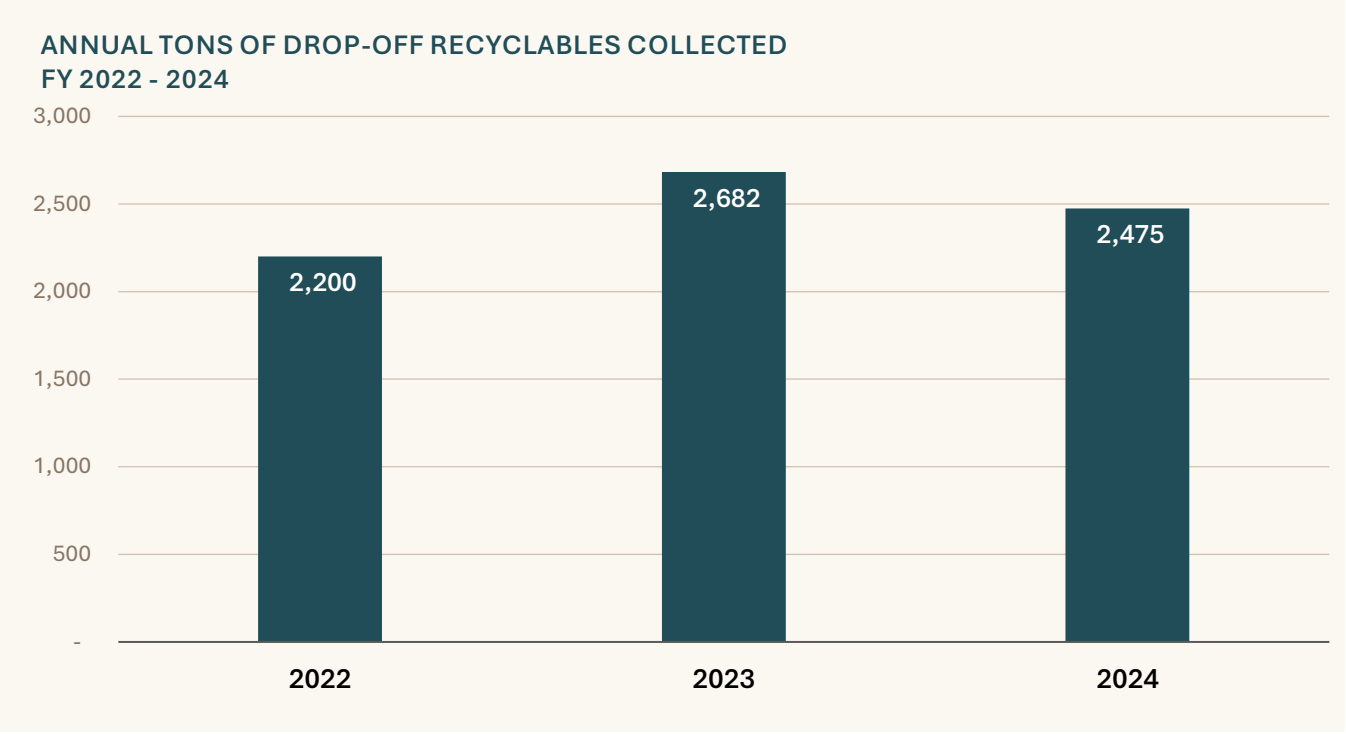


Figure 10: Charlevoix County Reported Drop-Off Recycling Tonnages

The calendar-year monthly tonnage data, illustrated in Figure 11 below, provides a particularly useful lens for understanding the influence of seasonal population influxes on recycling generation in Charlevoix County. From approximately May through September each year, monthly recycling tonnages are consistently above the annual monthly average, reflecting the significant increase in population that accompanies peak tourism season and the influx of seasonal residents occupying secondary and vacation homes. This pattern is pronounced and repeatable across years. The highest single month on record was July 2025 at 296 tons, while the lowest was February 2023 at 131 tons, a **difference of approximately 165 tons**, underscoring the degree to which seasonal population swings drive material generation in the county.

For the purposes of updated recycling rate estimates, **RRS used an average annual recycling tonnage of 2,270 tons**, representing the average of reported tonnages for 2020 through 2024. This figure is used as the baseline residential drop-off recycling volume in the recycling rate calculations presented later in this report.

As with prior reporting periods, there is currently no available information on recyclable tonnages collected through curbside programs, commercial recycling services, or industrial recycling activities within the county. No tonnage data are reported by private entities collecting recyclable materials through curbside or independent drop-off systems outside of the County's managed program. **The tonnages reflected here should therefore be considered a partial accounting of total recycling activity within Charlevoix County**, with the County-managed drop off program representing the primary documented recycling stream.

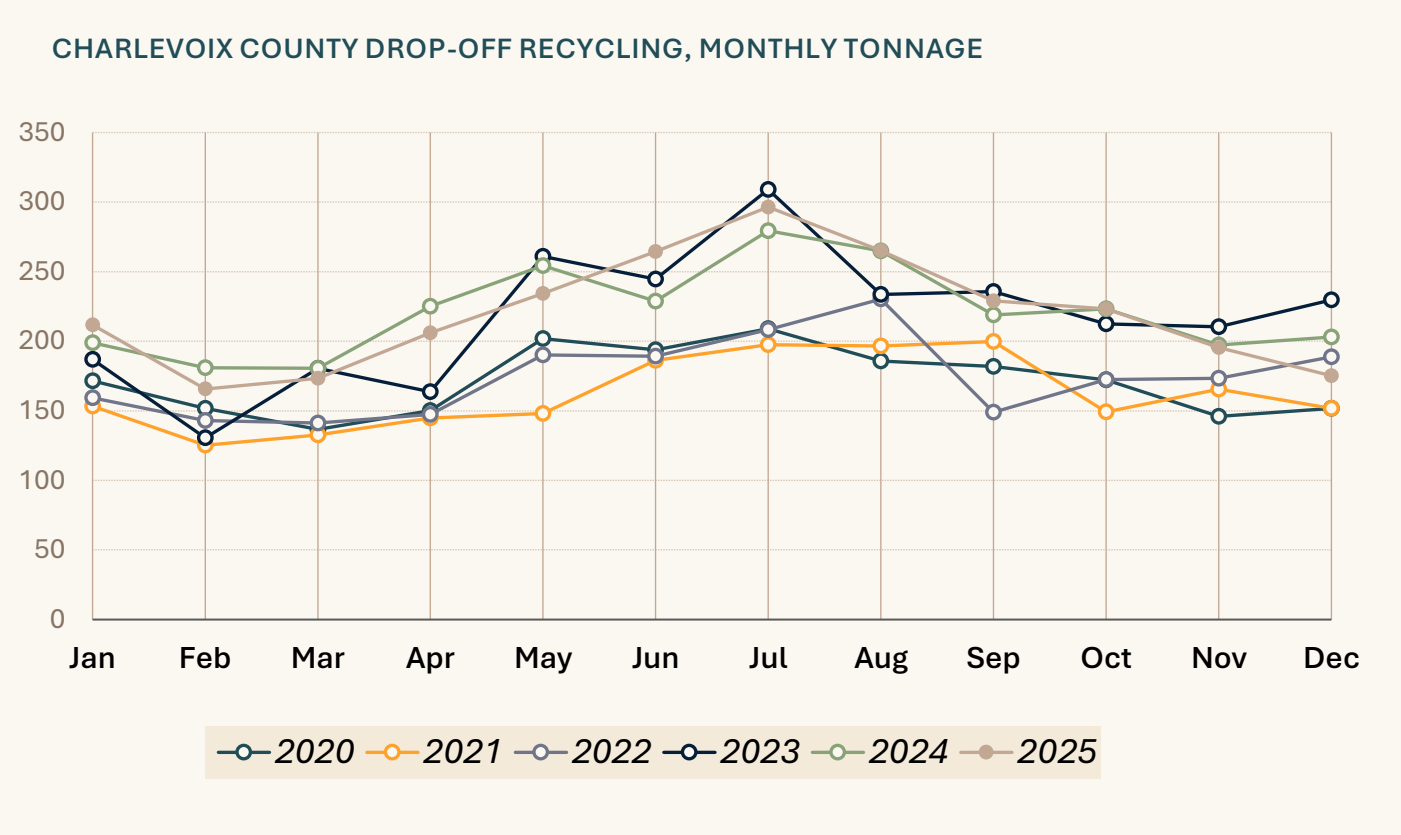


Figure 11 Charlevoix County Monthly Recycling Tonnage

MCW

The total tons of MCW attributed to Charlevoix County are available through the State's landfill reporting system; however, there is **no consistent reporting or tracking of tonnages collected by individual municipalities**. One notable exception is Melrose Township, which reported the number of trash compactor hauls from its drop-off program in 2024. Applying a standard conversion for compacted municipal solid waste (approximately 500 pounds per cubic yard), this equates to an estimated 425 tons per year. This estimate closely aligns with the Mega Data Project estimate of 419 tons per year for Melrose Township, providing confidence in the reasonableness of the Mega Data modeling approach.

Organics

In addition, the City of Charlevoix Department of Public Works reports an average of approximately **369 tons of organic material collected annually** through its municipal composting program. Because the finished compost is available for public use, there is currently no tracking of how much finished compost is reused or removed within a given year.

Due to these data gaps, the County does not currently have a complete measured recycling rate or diversion rate. Establishing consistent tonnage reporting and tracking systems represents a key opportunity to quantify these missing material flows, calculate a documented diversion rate, and track progress toward the goals established through the MMP process.

Recycling Rate Estimates

RECYCLING RATE VS DIVERSION RATE

As noted above, RRS estimates an MCW generation estimate of 4.6 pounds per person per day based on the State average. This MCW generation rate represents the average quantity of **waste disposed** per person per day and is used to estimate total disposal system demand.

To evaluate recycling performance and calculate a measured Recycling Rate it is also necessary to quantify the **weight of material recycled.** It is important to understand that for the MMP process, as defined by EGLE, the term **"Recycling Rate"** incudes both traditional recyclables (packaging and paper) and organic material (food scraps and yard waste).

The term **"Diversion Rate"** accounts for additional material diverted from landfill via reuse, recovery, donation, co-generation, digestion or other processes along with traditional recycling and composting. In order to calculate a complete diversion rate, the county would need tonnage data for material diverted via these additional methods.

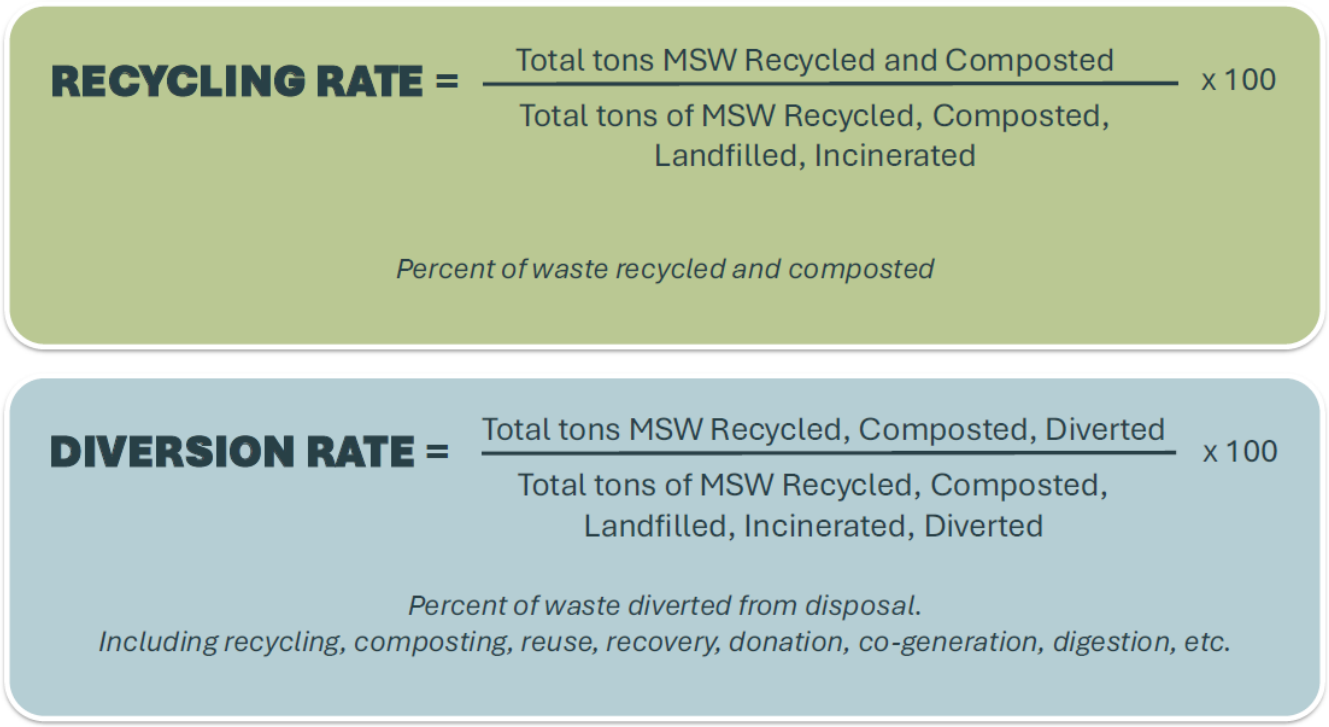


Figure 12: Recycling and Diversion Rate Definitions, EGLE, "Setting Materials Management Goals"[14]

RECYCLING RATE

In the absence of comprehensive, measured, and reported tonnages for recyclables collected through curbside programs and from commercial and institutional sources, proxy data may be used for planning purposes. RRS developed an estimation model during the statewide Mega Data Collection Project[15] to project recovered quantities using variables related to recycling access and recycling program design. The model draws on findings from The Recycling Partnership[16], which identifies characteristics of recycling programs that are associated with varying levels of material recovery per household.

The Recycling Partnership has identified several characteristics associated with high-performing residential recycling programs that capture higher quantities of material per household. These factors include:

- Curbside collection (rather than drop-off access),

[14] https://www.michigan.gov/-/media/Project/Websites/egle/Documents/Programs/MMD/Recycling/MMP-Goals-MRC-Presentation-Slides.pdf

[15] https://www.michigan.gov/egle/about/organization/materials-management/materials-management-in-michigan/mega-data-collection-project

[16] https://recyclingpartnership.org/wp-content/uploads/2018/05/state-of-recycling-report-Jan2017.pdf

- Use of collection carts instead of bins for curbside collection,
- Automatic enrollment and service delivery (residents receive recycling service with no action required) rather than opt-in participation, and
- Programs supported by public policy mechanisms (such as automatic service provisions or ordinances requiring haulers to offer curbside recycling alongside trash collection) compared with programs that lack supporting public action[17].

Based on the 2020 – 2023 MegaData Project, the projected recycling rates were as follows:

- **Residential Recycling Rate Estimate (Recycling + Compost):** 15.6%
- **Commercial Recycling Rate Estimate:** 8.2%
- **Countywide Recycling Rate Estimate:** 11.7%

Since completion of the Mega Data Project, Charlevoix County now has reported recycling tonnage from the county drop-off sites, totaling a 2020 - 2024 average of 2,270 tons. While reported tonnages of recycled organic materials countywide are not available, applying the Mega Data estimate of approximately 999 tons per year of organics recycling results in an estimated **3,269 tons recycled in 2024** (2,270 tons of traditional recyclables plus 999 tons of organics).

From the State Landfill Reports, the average reported tonnage of MCW disposed of 2020 - 2024 is 3,558. Using this disposal figure, the estimated countywide recycling rate would be approximately 48%, which is significantly higher than the 11.7% recycling rate projected during the Mega Data Project. However, this disposal tonnage corresponds to an implied disposal rate of roughly 0.75 pounds per person per day, which is unusually low. Given this discrepancy, it is more reasonable for planning purposes to apply a higher the **state average MCW disposal rate of 4.6 pounds per person per day**, which corresponds to an **estimated 21,947 tons of MCW disposed annually** in Charlevoix County.

Using the estimated **3,269 tons recycled** and **25,407 tons landfilled**, the countywide recycling rate for 2024 is estimated at approximately **13%**.

It is important to emphasize that this figure remains an estimate, given the lack of measured organic diversion tonnages and the likelihood of misreported or inconsistently categorized MCW disposal data. Charlevoix County has a clear opportunity to improve the accuracy of future recycling calculations by clarifying and standardizing landfill reporting procedures and by establishing systems to consistently track and report organic material diversion. Doing so would enable the County to calculate a measured recycling rate and more effectively track progress toward the goals established in the MMP.

[17] https://recyclingpartnership.org/wp-content/uploads/2018/05/state-of-recycling-report-Jan2017.pdf

CHARLEVOIX COUNTY	TOTAL WASTE GENERATION (TONS)	TOTAL RECYCLING (TONS)	TOTAL REQUIRING DISPOSAL (TONS)	RECYCLING RATE
Mega Data Estimates, 2020-2023	25,075	2,927	22,149	**12%**
Updated Estimate 2024: • 2020 -2024 Average Reported MCW Tons (3,558) • 2020 – 2024 Average Reported Recycling Tons (2,270) • Estimated Organics Tons (999)	6,827	3,269	3,558	**48%**
Updated Estimate 2024: • State Average MCW per Capita Tons (22,138) • 2020 – 2024 Average Reported Recycling Tons (2,270) • Estimated Organics Tons (999)	25,407	3,269	22,138	**13%**

Table 8: Estimated Recycling Rates

Recycling Data Gaps

Several significant data gaps limit Charlevoix County's ability to fully quantify recycling and diversion performance. Most notably, there is no reliable accounting of **commercial and institutional recycling tonnage** that may be collected directly by private haulers. Many businesses and institutions may be recycling materials through contracted services, but without standardized reporting requirements, these recovered materials are not reflected in countywide diversion calculations. Establishing consistent hauler reporting requirements would allow the County to capture this missing data and better understand the full scale of recycling activity occurring outside of publicly managed programs.

In addition, there is a lack of information regarding any **curbside recycling services** that may be operating on a subscription basis for residential or commercial customers. Even limited or informal curbside collection can contribute meaningful tonnage to overall diversion, yet these materials remain unaccounted for in the absence of hauler reporting. Similarly, **organic material diversion data**, including both food waste and yard waste, is incomplete. While some municipal yard waste programs are known to exist and organics may be managed through private composting or mulching facilities, tonnage data are not consistently tracked or reported. As a result, the County cannot calculate a fully **measured recycling rate or diversion rate** and must rely on estimates and partial datasets.

These gaps also limit the County's ability to quantify progress on food waste reduction, which is a key materials management priority from EGLE. Food waste is typically disposed of in the landfill as part of mixed MCW, and without a robust waste audit system there is no clear way to quantify how many tons of disposed MCW are food waste over time. Alternatively, meaningful measurement can be achieved by separating food waste at the source, through food rescue and/or composting programs, and tracking the weight of diverted material. Expanded source separation paired with consistent tonnage reporting would allow the County to quantify diversion more accurately and track reductions in landfilled food waste in a measurable way.

Hard-to-Recycle Materials and Collection Events

Charlevoix County conducts Household Hazardous Waste (HHW) collection events twice each year, typically in June and September. Event locations rotate throughout the county, and accepted materials may vary by event. In **2024**, the County reported a total of **80.91 tons of HHW materials** collected through these events. Materials commonly accepted include appliances (with certain exclusions), electronics, household chemicals, used motor oil, batteries, oil-based paints, and latex paint (accepted with a fee). Mattresses are also accepted for a fee. Scrap tire collection is offered on an alternating-year basis when grant funding is available; in **2024**, the County reported that 206 tires were collected through this program.

In addition to county-sponsored events, Bay Area Recycling for Community (BARC), a nonprofit organization based in Traverse City provides year-round collection services for select hard-to-recycle materials, including electronics and mattresses for modest processing fees, at its Traverse City and Kaleva, Michigan locations. Mattress recycling is a unique and specialized service offered by BARC, and the organization recently received EGLE grant funding to expand its mattress recycling capacity, further improving regional access to this difficult-to-manage material stream. Establishing convenient and frequent mattress and electronics recycling services within Charlevoix County in partnership with BARC or another logistics/recycler would provide more routine opportunities for recycling these ubiquitous waste materials and prevent them from going to landfills.

At this time, historical tonnage data are not readily available for materials collected through the County's special collection events, nor are tonnage data available for mattresses or other materials collected by BARC or other private entities. Additionally, HHW tonnage does not directly equate to recycling tonnage; HHW programs are primarily intended to ensure the safe handling and proper disposal of hazardous materials, although some components may ultimately be recycled. Keeping HHW out of landfills remains a critical environmental and public health objective. As a result, HHW tonnage collected in 2024 was not included in the updated recycling rate estimates. Establishing consistent reporting of event participation and specific material quantities collected and the disposal/recycling destinations would enhance the County's ability to quantify recovery, identify priority material streams, and track progress over time.

Construction & Demolition (C&D) Debris

While no C&D debris recycling tonnages were provided for this report to show active diversion, landfill reporting shows that C&D waste accounts for an average of 6% of total landfill tonnage over the last 5 years as shown in Table 2, with the majority going to City Environmental Services, Inc of Waters in Crawford County. C&D debris includes anything used in the construction of roads, bridges and buildings. Typically, these materials include concrete, asphalt, wood (treated or blond), drywall, asphalt shingles, metals, rigid and film plastics, vinyl siding and windows, carpet and other flooring, ceiling tiles, cardboard and other paper, glass, and insulation.

While population and economic growth is a significant factor in the generation of C&D debris, most landfill reporting would attribute an average of between 20% and 40% of inbound tonnage from construction and demolition activities. According to US EPA reports, the amount of construction and demolition waste generated in the United States is more than twice that of MCW. While Charlevoix County's C&D landfill tonnage is within the average range, a true representation of the types of C&D debris generated in the county would require either reporting on an ongoing basis or periodic waste characterization studies

that focus on C&D.[18] Some landfills actively seek out C&D debris and even offer discounted disposal rates. Sometimes the landfills are diverting clean wood and/or concrete for use on-site (after chipping, grinding, or crushing); others are diverting it from landfill entirely by sending it to local markets that can use it for landscaping, fuel, or road building aggregates.

C&D debris can be diverted from landfills at multiple points in the disposal chain. The most effective approach - yielding the cleanest material with the highest reuse or recycling value - is source separation at the construction site. With 146 construction-related businesses – the most of any single business type in the county (Figure 8) – the number of potential partners to engage is significant. Achieving this requires clear, consistent communication and convenient processes, whether through voluntary programs or mandatory policies. With construction reflecting the fourth largest sector by employee count (Figure 9), this engagement could have considerable reach and impact, both the number of people and potential diversion. Alternatively, mixed C&D processing offers convenience by eliminating on-site separation, but recovered materials have lower value due to contamination and the cost of processing. Mechanical or conveyor-based sorting also produces fine debris such as drywall dust, dirt, and wood particles (referred to as 'fines') with little to no market value.

Markets exist for some C&D materials when prepared according to specification and generated at a consistent rate:

WOOD

Clean wood, including woody vegetation, untreated dimensional lumber, and pallets, would likely constitute sufficient tonnage on a regular basis to warrant separation and would result in meaningful and measurable impact on landfill-bound tonnage. Markets are likely to include:

- reuse of dimensional lumber 6 feet or longer and plywood/engineered boards at least 16 square feet that has not been painted or nailed
- landscaping for woodchips/mulch, with colorization potentially adding value
- energy sector, particularly where renewable energy inputs are sought as feedstock for energy production

SCRAP METAL

Though much of the scrap metal generated on construction sites is already recovered through informal collection by subcontractors and tradespeople, there could remain some fraction of scrap metal in the construction site debris that goes for disposal. A scrap metal container with clear labelling and discreetly positioned on the construction site would present an opportunity for anyone on the construction site to contribute any amount of metal for diversion. Local scrap metal companies would be interested in purchasing mixed or sorted metals from a construction site.

[18] C&D loads are typically excluded from most MSW/MCW waste characterization studies. While a waste characterization study may include a category for "C&D" it reflects de minimis amounts that were co-collected in an MSW/MCW collection truck. A specific C&D characterization is needed to capture material coming in rolloff boxes from construction projects.

CARDBOARD (OCC)

A collection container for OCC generated at strategic junctures during the project timeline will enable recovery of clean cardboard from product installation, such as cabinetry, appliances, and furniture. This large format cardboard will require a large container, ideally with a lid to protect it from precipitation. Cardboard can typically be delivered loose to a buyer but will carry higher value if baled.

CONCRETE

A designation of "clean" concrete is typically made by vendors that accept and produce a higher standard "crusher-ready' aggregate material. "Mixed aggregate", containing pieces of brick, ceramic, or other engineered inert materials, such as plastics and compound materials is not considered clean. Rebar sometimes presents additional processing challenges for aggregate producers and therefore markets for concrete with rebar are often limited. Partners for concrete recycling include local excavation companies and aggregate manufacturers.

VINYL

Rigid vinyl can come from several sources in a building or renovation project: siding, piping/conduit, window frames, flooring, and fencing are most common. These materials can be transported to a centralized collection point where they can be recycled into new vinyl products. Vinyl is typically not accepted at MRFs but specialty vinyl recyclers, like Fryman's Recycling in Dowagiac or others participating in Revinylize, the national vinyl recycling collaborative, may offer collection bins and pay the transportation costs in exchange for localized collection of rigid vinyl materials.

Storm Debris

At the request of Networks Northwest, RRS evaluated storm debris measurement and quantification methodologies to support Charlevoix County's preparedness for debris generated by major storms and severe weather events. Establishing baseline debris estimates is an important first step in emergency debris management planning, which is typically implemented through a countywide Emergency Operations Plan (EOP) and supporting annexes.

The Michigan State Police, Emergency Management & Homeland Security Division provides a **Local Disaster Debris Management Plan Template**[19] for counties, cities, and townships to adapt. The template positions disaster debris planning as a companion to the EOP and as a local counterpart to the State's Disaster Debris Management Plan. Adoption of local debris plans varies, and EGLE has noted that outside of hurricane-prone regions, many communities do not complete disaster debris

[19] https://www.michigan.gov/-/media/Project/Websites/msp/EMHSD/Publications/Local_Disaster_Debris_Management_Plan_Template_2008_Final_Edition.pdf?rev=f548c2a196c248c69772fa733bc01714&utm

pre-planning. As a result, the Materials Management Plan (MMP) process represents a timely opportunity to "connect the dots" by documenting the infrastructure, roles, and material pathways that emergency management will depend on during surge conditions.

RRS recommends aligning disaster debris planning with MMP planning because both efforts rely on the same underlying materials management system, facilities, collection/processing capacity, transportation logistics, and end markets, operating under different time horizons. Even without a finalized County or local Disaster Debris Management Plan, the MMP can formalize this linkage by capturing core operational elements that will be needed during an incident, including:

- **Sites:** Existing solid waste and recycling facilities, as well as candidate temporary debris staging and reduction sites, including key constraints (e.g., access, drainage, and traffic control). This enables emergency operations to begin with identified options rather than starting from zero.
- **Capacity:** Normal throughput versus surge conditions, including overflow routing options. The County can also pre-define "activation triggers" tied to capacity constraints (e.g., transfer station queues exceeding a defined threshold for multiple days, or primary MRF downtime exceeding 48 hours).
- **Roles and responsibilities:** Identification of who supports the Emergency Operations Center (EOC) with materials management decisions, regulatory coordination, and communications.
- **Contractors and end markets:** Pre-identified pathways for hauling, grinding, C&D handling, white goods, and HHW management; recognizing that surge volumes may require intermediate staging and alternative destinations.
- **Public guidance hooks:** Pre-developed reuse- and recycling-first messaging where feasible, consistent with EGLE storm debris guidance, including separating materials and emphasizing recovery options when conditions allow.

RRS has developed preliminary storm debris estimates (in cubic yards) for multiple weather scenarios; these estimates are presented in the following subsections.

SCENARIO 1: ICE STORMS

The first scenario evaluates an ice storm producing between **0.25 inches and 1 inch of ice accumulation** with sustained winds between **10 and 30 mph**. The debris estimate uses roadway mileage as a key input, based on MDOT's published **System Length / Route Miles** metric[20], which for Charlevoix County is **854 miles.** In MDOT's reporting, System Length / Route Miles generally represent roadway centerline mileage (counting only one side of divided roads and excluding ramps) for public roads

[20] https://www.michigan.gov/mdot/-/media/Project/Websites/MDOT/Programs/Planning/Asset-Management/HPMS/Statewide-Statistics-LS-County.pdf

open to travel and certified by public road agencies; MDOT notes this dataset is GIS-based, tied to federal mileage certification processes, and available historically back to 1990.

Using the county's applicable route-mile input and the scenario assumptions above, RRS estimates that ice storms of these magnitudes could generate the approximate debris quantities below. These calculations are based on methodology laid out in a published 2011 study *Rapid Assessment of Tree Debris Following Urban Forest Ice Storms*[21], including a negative correlation between wind speed and debris volume (as wind speed increases less debris observed). FEMA guidance[22] indicates that ice and snowstorm debris streams are typically dominated by **vegetative debris** (downed limbs and trees), along with **overhead utility system components** associated with damaged lines and service infrastructure (see Figure 13).

COUNTY NAME	SYSTEM MILES	WIND SPEED MPH	ICE THICKNESS (INCHES)	SCENARIO 1 DEBRIS ESTIMATE CUBIC YARDS
Charlevoix	854	10	0.25	83,205
		20	0.25	52,048
		30	0.25	20,892
		10	0.50	166,409
		20	0.50	104,097
		30	0.50	41,784
		10	0.75	249,614
		20	0.75	156,145
		30	0.75	62,676
		10	1.00	332,819
		20	1.00	208,193
		30	1.00	83,567

Table 9: RRS Estimated Ice Storm Debris Volumes CY

SCENARIO 2: SEVERE WEATHER EVENTS

Scenario 2 evaluates debris generation associated with **severe weather events**, with or without precipitation, characterized by **wind speeds ranging from 74 mph to 157+ mph**. At the upper end of this range, the scenario includes **tornado events**, which can produce highly variable and localized debris conditions. The debris estimates generated under this scenario

[21] Hauer, Richard J.; Hauer, Angela J.; Hartel, Dudley R.; Johnson, Jill R. 2011. Rapid Assessment of Tree Debris Following Urban Forest Ice Storms. Arboriculture & Urban Forestry 37(5):236–246. https://www.srs.fs.usda.gov/pubs/ja/2011/ja_2011_hauer_001.pdf

[22] https://www.fema.gov/sites/default/files/2020-07/fema_325_public-assistance-debris-mgmt-plan_Guide_6-1-2007.pdf, Chapter 6

incorporate multiple variables beyond wind speed, including **household density**, **vegetation cover**, and the **prevalence of commercial properties**, all of which influence both the quantity and composition of storm debris.

For Charlevoix County, the model inputs include **11,274 households**, a **Heavy vegetation** classification, and a **Light commercial property** designation. Heavy vegetation is typically associated with mature neighborhoods and wooded areas where dense tree canopy cover limits visibility of the ground or structures, increasing the likelihood of vegetative debris during severe wind events. The Light commercial property classification reflects a lower concentration of large commercial structures relative to residential land uses, which influences the proportion of construction and demolition (C&D) debris expected in the debris stream.

In addition to debris volume estimates, it is important to consider anticipated debris composition. FEMA guidance[23] describes typical tornado debris as including vegetative debris, construction and demolition (C&D) debris, personal property/household items, hazardous waste, household hazardous waste (HHW), white goods, and vehicles and vessels (see Figure 8).

The resulting debris estimates, segmented by precipitation condition and wind speed category, are presented in the table below. These estimates are intended to support emergency planning by illustrating the potential range of debris volumes that could be generated under severe weather scenarios affecting Charlevoix County.

COUNTY	HOUSEHOLDS	COMMERCIAL PROPERTY	VEGETATION	WIND SPEED	PRECIPITATION	SCENARIO 2 DEBRIS ESTIMATE CUBIC YARDS
Charlevoix	11,274	Light	Heavy	74-95 MPH	None to Light	33,822
				74-95 MPH	Medium - Heavy	40,586
				96-110 MPH	None to Light	135,288
				96-110 MPH	Medium - Heavy	162,346
				111-129 MPH	None to Light	439,686
				111-129 MPH	Medium - Heavy	527,623
				130-156 MPH	None to Light	845,550
				130-156 MPH	Medium - Heavy	1,014,660
				157+ MPH	None to Light	1,352,880
				157+ MPH	Medium - Heavy	1,623,456

[23] https://www.fema.gov/sites/default/files/2020-07/fema_325_public-assistance-debris-mgmt-plan_Guide_6-1-2007.pdf, Chapter 6

Table 10: RRS Estimated Severe Weather Debris Volumes CY

		Typical Debris Streams								
		Vegetative	Construction & Demolition (C&D)	Personal Property/ Household Items	Hazardous Waste	Household Hazardous Waste (HHW)	White Goods	Soil, Mud and Sand	Vehicles and Vessels	Putrescent
Types of Disasters	Hurricanes / Typhoons	X	X	X	X	X	X	X	X	X
	Tsunamis	X	X	X	X	X	X	X	X	X
	Tornadoes	X	X	X	X	X	X		X	X
	Floods	X	X	X	X	X	X	X	X	X
	Earthquakes		X	X		X	X	X		
	Wildfires	X		X		X	X	X		
	Ice Storms	X				X				

Figure 13: FEMA-325 "Figure 6.2 – Typical Debris Streams for Different Types of Disasters"[24]

Facility Inventory

Name	Address	Address	Description
St Mary's Cement US LLC	16000 Bells Bay Rd	Charlevoix	Type III Landfill
Charlevoix Transfer Station	15890 Bells Bay Rd.	Charlevoix	Processing & Transfer Facility
Beaver Island Transfer Station and Recycling Center	36770 East Side Drive	Beaver Island	Processing & Transfer Facility

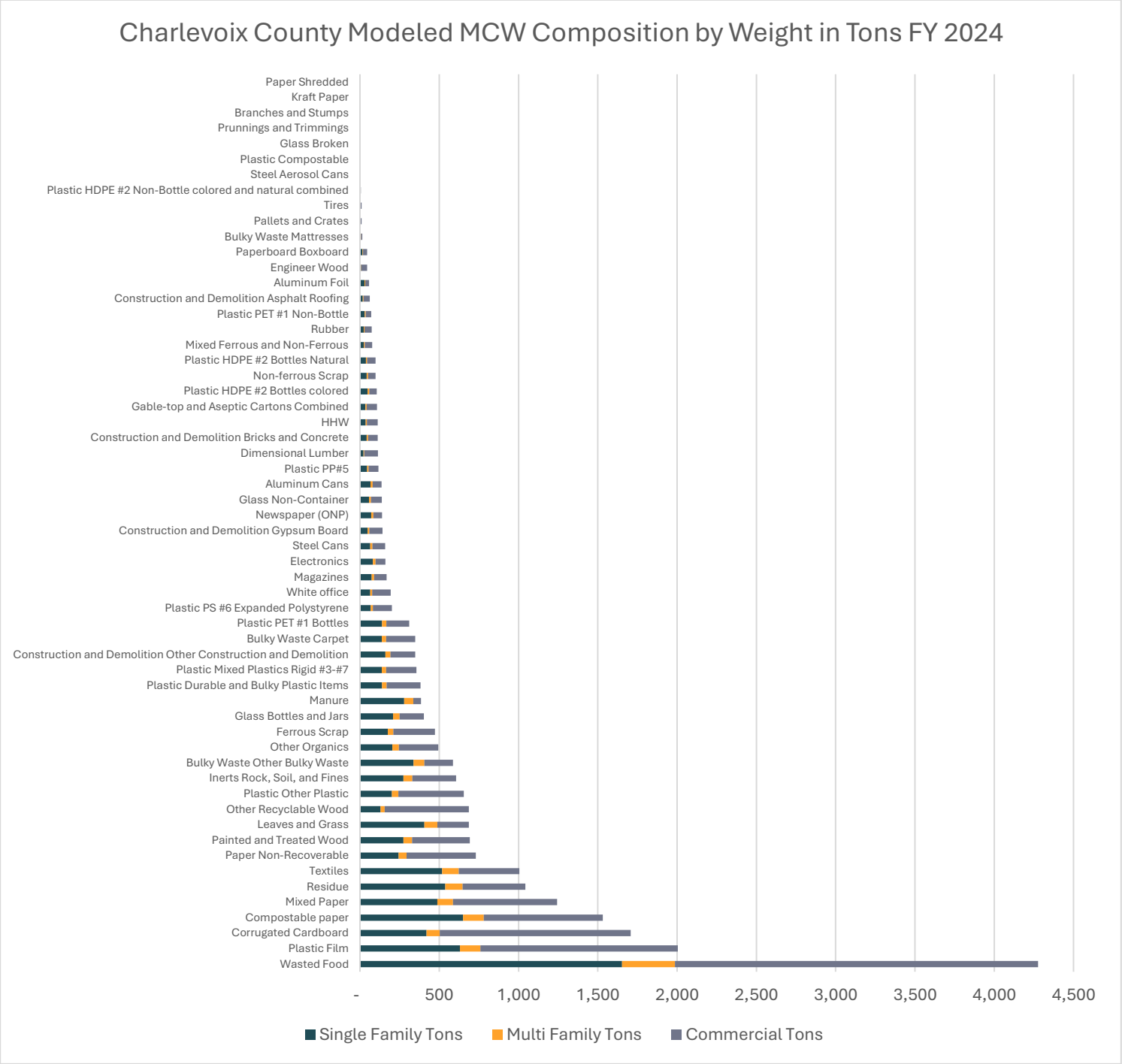
[24] https://www.fema.gov/sites/default/files/2020-07/fema_325_public-assistance-debris-mgmt-plan_Guide_6-1-2007.pdf

Boyne Valley Township Transfer Station	1408 S. Addis Rd	Boyne Falls	Processing & Transfer Facility
Melrose Township Transfer Station	4449 State St	Boyne Falls	Processing & Transfer Facility
Charlevoix County Recycling - Boyne City	1251 Boyne Avenue	Boyne City	Other Source Separated Facility
Charlevoix County Recycling - Charlevoix City	1030 Grant Street	Charlevoix	Other Source Separated Facility
Charlevoix County Recycling - Boyne Valley Township Transfer Station	1408 S. Addis Rd	Boyne Falls	Other Source Separated Facility
Charlevoix County Recycling - Melrose Township Transfer Station	4449 State St	Boyne Falls	Other Source Separated Facility
Charlevoix County Recycling - City of East Jordan	110 Bartlett Street	East Jordan	Other Source Separated Facility
Beaver Island Transfer Station and Recycling Center	36770 East Side Drive	Beaver Island	Other Source Separated Facility
City of East Jordan Transfer Station	700 Nichols Street	East Jordan	Compost Facility
Boyne City - North Boyne Yard	1321 ROBINSON ST	Boyne	Compost Facility
City of Charlevoix Stump-Composting Area	6894 S US HIGHWAY 31	Charlevoix	Compost Facility

Table 11: Materials Management Infrastructure

Appendix

RRS MCW Composition Model



Definitions of the Benchmark Recycling Standards

Michigan Legislature. (1994). Natural resources and environmental protection act, Act 451 of 1994, Part 115, § 11502. Retrieved from Michigan Legislature website: https://www.legislature.mi.gov/documents/mcl/pdf/mcl-451-1994-ii-3-115.pdf

(6) "Benchmark recycling standards" means all of the following requirements:

(a) 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:

(*i*) 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.

(*ii*) 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.

(*iii*) 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.

(*iv*) The curbside recycling is provided by the municipality or the resident has access to curbside recycling by the resident's chosen hauler.

(b) By January 1, 2032, the following additional criteria:

(*i*) 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.

(*ii*) 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.

BUSINESS SECTOR DEMOGRAPHICS, NUMBER OF ESTABLISHMENTS AND NUMBER OF JOBS

Datasets generated by Esri, provided by Networks Northwest

ESTABLISHMENTS

Industry	2018	2023
Construction	117	146
Retail Trade	114	120
Accommodation and food services	79	97
Health care and social assistance	55	87
Other services (except public administration)	76	82
Professional, scientific, and technical services	44	68
Manufacturing	45	57
Administrative support and waste management and remediation services	53	57
Arts, entertainment, and recreation	37	41
Real estate and rental and leasing	29	40
Finance and insurance	29	36
Wholesale Trade	16	21
Unclassified	8	18
Transportation and warehousing	11	10
Agriculture, forestry, fishing and hunting	5	8
Information	8	8
Utilities	4	5
Management of companies and enterprises	1	2
Educational services	5	0
Mining, quarrying, and oil and gas extraction	1	

JOBS

Industry	2018	2023
Manufacturing	2,451	2,874
Accommodation and food services	1,827	1,838
Retail Trade	876	879
Construction	609	593
Administrative support and waste management and remediation services	253	302
Other services (except public administration)	305	275
Arts, entertainment, and recreation	267	270
Real estate and rental and leasing	184	214
Utilities	148	197
Finance and insurance	161	153
Wholesale Trade	53	110
Transportation and warehousing	79	65
Agriculture, forestry, fishing and hunting		47
Unclassified	11	35
Information	24	29
Mining, quarrying, and oil and gas extraction		
Professional, scientific, and technical services		
Management of companies and enterprises		
Educational services	67	
Health care and social assistance	1,422	