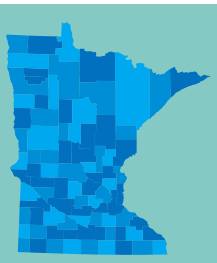
Packaging and Paper Products

November 2025

DRAFT Minnesota Preliminary Assessment for Packaging Waste and Cost Reduction Act

A report of findings on Minnesota's current management of packaging and paper products covered under the Packaging Waste and Cost Reduction Act including tonnage of materials, inventory of existing infrastructure, and available markets.

MINNESOTA POLLUTION CONTROL AGENCY



Preliminary Assessment for the Packaging Waste and Cost Reduction Act

About this report

The Minnesota Pollution Control Agency (MPCA) hired Eunomia Research and Consulting (Eunomia) in partnership with Foth Infrastructure & Environment (Foth) to complete the Preliminary Assessment. This is the first of two reports to be completed to inform the implementation of the Packaging Waste and Cost Reduction Act.

Legislative charge

Minnesota Statute, Chapter 115A.1450, Subdivision 1 (a) & Subdivision 3.

(a) By December 31, 2025, the commissioner must complete a preliminary assessment according to this section.

*Subd. 3.**Content of preliminary assessment.***

A preliminary assessment must be completed for a preceding period of no less than 12 months and no more than 36 months, that includes:

(1) identification of currently or recently introduced covered materials and covered materials types;

(2) tons of collected covered materials;

(3) the characteristics of recycling and composting programs, including a description of single-stream and dual-stream recycling systems offered in the state and prevalence of their use, average frequency of collection of covered materials for recycling and composting, types of collection containers used, commonly accepted materials for recycling and composting, and total costs by type of covered entity;

(4) processing capacity at recycling facilities, including total tons processed and sold, composition of tons processed and sold, current technologies utilized, and facility processing fees charged to collectors delivering covered materials for recycling;

(5) capacity of, technology used by, and characteristics of compost facilities to process and recover compostable covered materials;

(6) capacity and number of drop-off collection sites;

(7) capacity and number of transfer stations and transfer locations;

(8) average term length of residential recycling and composting collection contracts issued by political subdivisions and an assessment of contract cost structures;

(9) an estimate of total annual collection and processing service costs based on registered service provider costs;

(10) available markets in the state for covered materials and the capacity of those markets; and

(11) covered materials sales by volume, weight, and covered materials types introduced by producers.

Minnesota Pollution Control Agency

520 Lafayette Road North | Saint Paul, MN 55155-4194 |

651-296-6300 | 800-657-3864 | Or use your preferred relay service. | Info.pca@state.mn.us

This Preliminary Assessment is available in alternative formats upon request, and online at www.pca.state.mn.us.

Authors

Ann Ballinger, Eunomia
Emmie Bescombes, Eunomia
Claire Chu, Eunomia
Sarah Edwards, Eunomia
Molly Hickman, Eunomia
Kaitlin Reese, Eunomia
Ella Thirroueiz, Eunomia
Nathan Klett, Foth
Angie Lemar, Foth
Mallory Anderson, MPCA
Quinn Carr, MPCA

Contributors/acknowledgements

Molly Flynn, MPCA
Nathan Reinbold, MPCA
Danielle Drussell, MPCA
Gabi Rosenthal, MPCA
Ben Crowell, MPCA
Alison Cameron, MPCA
Trevor Thomas, MPCA
Erin Hertog, MPCA

Prepared for:

Minnesota Pollution Control Agency
520 Lafayette Road
St. Paul, MN 55155

Prepared by:

Eunomia Research and Consulting
https://eunomia.eco/

Foth
www.foth.com

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Acronyms and Glossary of Terms

List of Acronyms

CAA	Circular Action Alliance
EPS	Expanded polystyrene
GIS	Geographic Information System
HDPE	High-Density Polyethylene
LDPE	Low-density polyethylene
MN	Minnesota
MPCA	Minnesota Pollution Control Agency
MSW	Municipal Solid Waste
MMSW	Mixed Municipal Solid Waste
MWP	Mixed Waste Processing (MWP)
NC	North Central
NE	Northeast
NW	Northwest
OCC	Old corrugated containers
PET	Polyethylene terephthalate
PP	Polypropylene
PRO	Producer Responsibility Organization
PS	Polystyrene
PVC	Polyvinyl chloride
REC	Minnesota Recycling Education Committee
RDF	Refuse Derived Fuel
SCORE	Select Committee on Recycling and the Environment
SE	Southeast
SSO	Source separated organics
SW	Southwest
SWMP	Solid Waste Management Plan
TCMA	Twin Cities Metropolitan Area
WTE	Waste to Energy

Glossary of Terms

Aerated Static Pile: A composting method in which organic materials are piled and aerated using a system of perforated pipes or blowers, without the need for turning.

Air knives/air separation: Equipment used for density separation to separate heavy materials (glass, grit, rocks) from lighter materials (paper, plastics).

Balers: Equipment used to densify recovered materials that have been separated in a material recovery facility (MRF) into a single commodity. Balers allow MRFs to densify commodities to allow for more cost-effective shipment of materials.

Ballistic separation: Equipment that rotates in an elliptical motion to move lighter 2-dimensional materials like paper run over the screen, heavier 3-dimensional materials like containers bounce backwards from the screen, and small materials like broken glass fall through holes that remove them from the stream. The 3 fractions from a ballistic separator are typically collected on three different conveyors for additional separation (3-dimensional containers), quality control (2-dimensional) and glass or residue.

Commercial, Industrial, and Institutional Waste: Waste generated by businesses, institutions, and industrial facilities.

Conveyors: Device used to transfer materials from one area of the MRF to another or between pieces of equipment

Covered material: Packaging and packaging components, food packaging, and paper products sold, offered for sale, distributed, or used to ship a product within or into Minnesota, including online purchases and shipments. Covered material does not include exempt materials.

Drum separator: Drum separators use a combination of high-speed conveyors, fans, and a rotating drum to separate materials based on weight and density.

Eddy Current separator: A type of sorting equipment that uses magnetic rotors to create a force called an eddy current that separates non-ferrous metals such as aluminum, die-cast metal, and copper, from non-metallic materials like paper or plastic.

Environmental center: Locations that accept a wide variety of materials including recyclable materials, problem materials, and household hazardous waste. This includes the definition of a “recycling center” from Minn. Stat. § 115A.555, including specific opening hours requirements.

Extended Producer Responsibility (EPR): An environmental policy approach in which a producer's responsibility for a product is extended to the post-consumer stage of that product's life cycle.

Liberation device (bag opener, shredder, metering drum/wheel/bunker, etc.): Equipment used to open bagged materials to allow for sortation of the bagged contents.

Magnets: Equipment used to recover ferrous metals and transfer them to a separate conveyor.

Manual presort: Typically, an area at the beginning of a MRF where a person or people physically remove contaminants or larger materials (may or may not be recyclable) that may damage downstream equipment.

Materials Recovery Facility (MRF): A solid waste plant that sorts and processes materials to prepare them for recycling. MRFs may accept dual-stream or source-separated recyclables where materials such as paper have been sorted by individuals before collection, commingled recyclable material, or mixed streams that contain both solid waste and recyclable material. The sorting equipment and technology integrated into a MRF depends on what type of material stream it is designed to accept.

Mixed Waste Processing (MWP): A facility or system that receives unsorted municipal solid waste and separates it into recyclable, compostable, and residual waste streams using mechanical and/or manual methods.

Multi-Family residences: Residential buildings containing multiple separate housing units, such as apartments, condos, or townhomes.

Municipal Solid Waste (MSW): MSW refers to household waste, commercial waste, waste generated by other nonindustrial locations, waste with characteristics similar to that generated at a household or commercial business, or any combination thereof. MSW does not include municipal wastewater treatment sludges, industrial process wastes, automobile bodies, combustion ash, or C&D debris.

Mixed Municipal Solid Waste (MMSW): MMSW refers to household waste, commercial waste, waste generated by other nonindustrial locations, waste with characteristics similar to that generated at a household or commercial business, or any combination thereof that has not been source-separated. MMSW does not include municipal wastewater treatment sludges, industrial process wastes, automobile bodies, combustion ash, or C&D debris.

NAICS Codes: Standardized codes from the North American Industry Classification System used to classify business establishments by industry.

Optical sorting: Optical sorting systems are a technology that includes advanced cameras or near infrared and sensors to identify waste and use jets of air to move and sort materials into categories.

Organics recycling: Programs that accept food scraps and compostable packaging and paper (source separated organics) to be delivered to a compost site or anaerobic digester to be recycled.

Organized collection services: Refers to collection services that are coordinated by a city, town or county for all households within the jurisdiction.

Open market collection services: Refers to collection services where individuals, households or property owners independently choose their own hauler.

Recycling (and/or organics) drop-off sites: locations where collection containers are made available for residents to drop-off single-stream recyclables and/or organics (SSO). These sites are minimally or not staffed. Collection containers are typically carts, dumpsters, or roll-off containers (some covered and some sectioned by material).

Recycling shredders: Shredding machines cut materials into smaller, more uniform pieces for further processing. Shredding also reduces material volumes which makes it easier to manage and transport. Shredding machinery can be used on a wide variety of materials, including metal, plastic, paper, wood, and electronics.

Refuse Derived Fuel (RDF): A combustible product created by processing mixed municipal and industrial waste into a more consistent, higher-energy fuel source.

Retail drop-off sites: locations where a person can drop off a specific recyclable material at a retail location for recycling, for example plastic film.

Robotics employing AI: Equipment using cameras to identify materials and "learn" using AI to improve the ability to identify the material a robotic arm is intended to pick. The camera tells the robot arm the specific location of the targeted material.

SCORE funding: State or local grants (often from recycling or waste programs) provided to support waste reduction, recycling, or organics management initiatives.

Screens: Screening equipment is a common type of equipment in MRFs that separate materials based on size and shape (2-dimensional vs 3-dimensional). Some examples include star screens, debris roll screens, glass breaker screens, disc screens which are typically used to separate materials based by size and are typically a series of shafts, connected at both ends, spaced based on the size of material, that rotate to agitate materials to allow smaller material to fall between the rotating shafts and larger materials to pass over the top to the next piece of equipment. Auger screens also separate materials by size and have rotating shafts that are only connected at one end to minimize wrapping of long stringy materials. Inclined screens are similar to screens used for size separation but are inclined and separate containers (3 dimensional) from flat (2 dimensional) materials and the small heavier fraction like broken glass, grit, or stones fall through the screen.

Single Family residences: Residential buildings designed to house one family, typically a standalone home with its own entrance and utilities.

Single-stream recycling: materials that go into a commingled stream to be further sorted, often at a material recovery facility, before being sold. This includes corrugated cardboard, mixed paper, aluminum, metal cans, bottles and jars, and plastic bottles and tubs.

Source-Separated Organics (SSO) or "organics": Materials that are separated at the source including materials like food scraps, soiled paper, and compostable packaging that can be composted or break down in a controlled microbial degradation to yield a humus-like product that meet compost standards and do not exceed 15 percent by weight of contamination.

Source-Separated Organics (SSO) or "Organics" Facilities: Specialized facilities that receive and process organic materials (such as food scraps, yard trimmings, and soiled paper) that have been separated from other waste streams at the point of generation.

Static Pile Composting: A composting method where organic materials are piled and aerated without turning, often using perforated pipes or blowers.

Throughput Capacity: The maximum amount of material that a facility or system can process over a specific period, usually measured per day or year.

Tons-Per-Day (TPD): A unit of measurement expressing the total weight of a material, substance, or waste stream generated, processed, or disposed of over the course of one day.

Tons-Per-Year (TPY): A unit of measurement expressing the total weight of a material, substance, or waste stream generated, processed, or disposed of over the course of one year.

Trommel: A trommel is an inclined rotating drum or tube that agitates material as it travels from one end to another. The drum or tube has various sizes of holes around the outside perimeter of the drum

that allows materials of various sizes to pass through the holes and larger material to exit at the end of the trommel. Typically, there are 3 different size fractions separated by a trommel. Trommels may have sharp protrusion as the start of the trommel to open bags

Twin Cities Metro Area (TCMA): Area of the state that includes the counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington.

Waste-to-Energy (WTE): A process or facility that converts non-recyclable waste materials into usable forms of energy, such as electricity, heat, or fuel, typically through combustion, gasification, or other thermal technologies.

Windrow Composting: A long, narrow pile of organic materials arranged for composting, typically turned periodically to maintain aerobic conditions.

Contents

Executive summary

Packaging and paper products account for more than one-third of the state's municipal solid waste (MSW) stream. The Packaging Waste and Cost Reduction Act (Minn. Stat. § 115A.144-115A.1463) creates an extended producer responsibility (EPR) program for packaging and paper products statewide.

The Minnesota Pollution Control Agency (MPCA) contracted with Eunomia to complete a Preliminary Assessment and Needs Assessment as required in the Packaging Waste and Cost Reduction Act. The two assessments will gather critical information about packaging and paper product introduction, use and reuse, and management in Minnesota (MN) that will inform the development of the EPR program statewide.

The Preliminary Assessment sets the stage prior to the comprehensive Needs Assessment. It includes:

- An overview of the **characteristics of recycling and composting programs** in the state;
- An overview of **existing infrastructure**;
- **A summary of the amount and types of packaging, food packaging, and paper products** introduced by producers into the state, along with the tonnages collected for recycling in the state; and
- High-level insight into **service costs and contractual arrangements for collection**.

The latest census data indicate that MN's current population is at 5.84 million. Over half of the MN population, 3.2 million residents, reside in the Twin Cities metro area (TCMA region). Population density ranges from 9,200 persons per square mile in the densest parts of the TCMA to 113 persons per square mile in the least dense parts of the state up in the northeastern part of MN.

MN's Packaging Waste and Cost Reduction Act applies to 'covered entities'; these covered entities include single family residences, multifamily residences, colleges, schools and childcare facilities, non-profit corporations with an annual revenue of less than $35,000,000, state agencies, political subdivisions, public areas, and public entities.[1] An estimated count of the number of covered entities in the state is shown in Table 1.

Table 1: Number of Covered Entities by Type in 2024

Type of covered entity	Total
Households	**2,265,170**
Single-Family households	**1,772,517**
Multi-Family households	**435,441**
Mobile Homes	**57,212**
Schools and childcare	**2,139**
Childcare	375
K-12 schools	1,669
Colleges & Universities	95
Non-profits (less than $35M in revenue)	**2,433**
Public buildings and spaces	**2,809**

[1] Minnesota Statutes § 115A.144 (2025). Retrieved from https://www.revisor.mn.gov/statutes/cite/115A/full#stat.115A.144

Recycling program characteristics vary significantly across MN, reflecting differences in collection systems, service coverage, accepted materials, drop-off infrastructure and recycling ordinance structures. Single-stream recycling is the dominant collection method statewide, although some counties in Greater MN continue to use source-separated or partially separated systems.

Access to recycling services also differs by region. The TCMA and parts of the NC and SE regions have high curbside collection coverage, while the more rural NE, NW, and SW regions rely primarily on drop-off sites.

The most common recycling collection containers used are 96-gallon carts for single family units, while multifamily buildings commonly use dumpsters, and some counties employ specialized systems such as bag-based or tote-based source separation systems.

The acceptance of recyclables including cardboard, mixed paper, glass bottles and jars, and aluminum and steel cans is almost universal throughout MN; however, the acceptance of PET and HDPE is less consistent, and materials such as PS, film, flexibles, and compostable packaging are not widely accepted.

Drop-off infrastructure also varies throughout MN, with almost 600 drop-off sites available for residents statewide. The drop-off sites are more concentrated in the NW and SW regions which are both almost 70% rural.

In MN, the collection of food scraps and compostable packaging and paper is referred to as “organics” and more formally source-separated organics (SSO). Access to these programs varies by region with some programs in Greater MN, mostly serviced through drop-off collection by residents. The TCMA is the only region where all cities have either organics recycling or drop-off services.

Recycling and compostable materials are managed through a network of Material Recovery Facilities (MRFs), transfer stations, composting facilities that are spread throughout the State. Table 2 shows the number of facilities by facility type by region within the state. Also shown in the table are the MRFs in neighboring states that receive and process recyclable materials from Counties in MN.

Table 2: Number of Facilities by Facility Type in Minnesota by Region

Facility Type	TCMA	NE	NW	NC	SE	SW	Out-State
MRFs	6	3	4	1	1	2	3
Transfer Station Solid Waste & Recycling	49	36	34	28	26	15	
Composting/Organics - SSO	4	1	1	2	0	1	

There are 13 recycling markets in MN for plastics, 26 for metals, 9 for paper/fiber, and 2 for glass, though updates to this database are required. According to the U.S. EPA’s Recycling Infrastructure Map[2], there are 151 potential primary end markets for metals, 85 for plastic, 75 for paper/fiber and 44 for glass.

[2] Environmental Protection Agency (2025) Recycling Infrastructure and Market Opportunities Map | US EPA accessed Nov 2025

In 2024, approximately 394,000 tons of covered materials were collected for recycling for residential households, with paper representing the largest share. Residential recycling data does not include multi-family buildings, which are serviced on commercial collection routes; therefore, multi-family tonnages were estimated using ratios from the project teams previous EPR work for Washington State. An estimated 48,000 tons of covered materials were collected from multi-family households. Tonnages from schools were also estimated at 13,000 tons based on lbs/student figures from Colorada State and the number of students in Minnesota public and private schools

Cost data for recycling and composting services was difficult to obtain, due to limited data being available for the Preliminary Assessment. For the Needs Assessment, further data will be obtained through surveys and interviews to provide more informed cost estimates.

However, provisional total recycling service costs by region were calculated for 2024 (incorporating residential curbside, commercial, and drop-off costs). These high-level figures indicated a total recycling service cost of ~$118m for MN. The Service Cost per Household in MN was estimated at $4.35 for 2024.

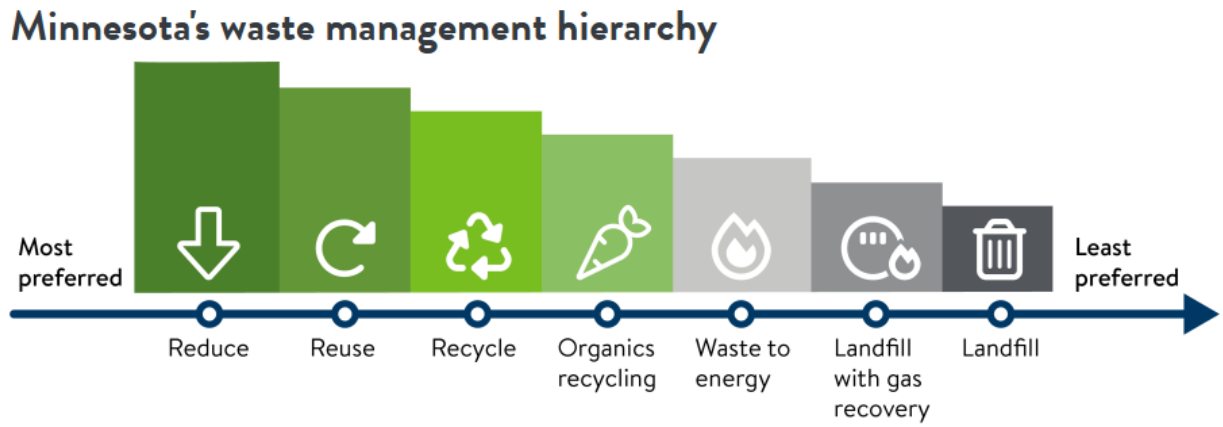
Provisional costs for organics services were also estimated, though due to limited data this is for residential curbside cost only. The residential organics service cost was estimated at $50.4m for MN, the majority of this being in the TMCA region ($42m).

Introduction

Background

The Minnesota (MN) Legislature has recognized the need for effective solid waste management to protect the environment and human health of Minnesotans. This commitment is demonstrated by the passage of the Waste Management Act (Minn. Stat § 115A) in 1980 to the passage of the Packaging Waste and Cost Reduction Act (Minn. Stat § 115A.144-115A.1463) in 2024. Throughout that time the MN Legislature has continued to discuss and pass laws that help prioritize moving materials up the state's waste management hierarchy.

Figure 1: MN waste management hierarchy



Packaging and paper products account for more than one-third of the state's mixed municipal solid waste (MSW) stream. The Packaging Waste and Cost Reduction Act creates an extended producer responsibility (EPR) program for packaging and paper products statewide. EPR policies incentivize more sustainable design and hold producers responsible for reducing the environmental impacts of the items they produce and managing them throughout the entire life cycle. MN's Packaging Waste and Cost Reduction Act goes beyond recycling and composting, as covered in this report, and includes waste reduction and reuse, which will be covered in the Needs Assessment. Program requirements apply to the following materials sold, offered for sale, distributed, or used to ship a product within or into MN, including online purchases and shipments ("covered materials"):

- Packaging: materials to transport, market, protect, or handle a product;
- Food packaging: materials to market, protect, handle, deliver, serve, contain, or store food and beverages; and
- Paper products: products made from wood or cellulosic fibers.

The Packaging Waste and Cost Reduction Act is designed to achieve the following objectives:

- **Less packaging overall and toxicity reduction.** More sustainable packaging options (refill and reuse) result in overall reduction in packaging materials manufactured and marketed, plus more efficient use of durable packaging. The program will also incentivize more sustainable design through eco-modulated fees that prioritize reducing impacts on the environment and human health, notably through waste and toxicity reduction of covered materials.
- **More packaging that is refillable, reusable, recyclable, and compostable.** All covered materials must be refillable by the consumer, reusable, recyclable, or compostable by 2032. Today, a lot

of items are single-use and disposable (e.g., multilayer plastic packaging); even if Minnesotans wanted to, they could not easily refill, reuse, recycle, or compost these covered materials.

- **More curbside collection and places to recycle**. Curbside services for recyclables and compostables will be expanded where they're currently limited or unavailable, and there will be more options, such as drop-off locations, for materials that are best collected through other methods. Some Minnesotans have limited or no access to these services and others do not have places to drop off recyclable or compostable materials that cannot be picked up curbside.
- **Reduced costs.** Producers will reimburse service providers for at least 90% of the cost of activities directly related to the refill, reuse, recycling, or composting (e.g., collection, transportation, sorting, preparation, etc.) of covered materials for covered entities, which includes single and multifamily housing, local governments, schools and childcare, and most nonprofits. This reduces what residents, local government, and others must pay.
- **Expanded infrastructure and jobs.** Producers will invest in infrastructure and responsible markets, resulting in more green jobs and business development related to collecting and managing covered materials.
- **Investment in education and clear standards.** The program includes public education to help people know what packaging is refillable, reusable, recyclable, or compostable and collection lists so Minnesotans can recycle and compost the same items throughout the state.

The Minnesota Pollution Control Agency (MPCA) is responsible for:

- **Gathering the initial data for program development** through a Preliminary Assessment and the Needs Assessment (repeated every five years);
- **Establishing statewide requirements** for the Producer Responsibility Organization (PRO) to meet in respect of waste reduction (including refill), reuse, recycling, composting, and use of postconsumer materials in new production;
- **Developing collection lists** for "commingled" recycling, composting, and alternative collection/recycling;
- **Reviewing and approving the PRO stewardship plan** (revised every five years) and annual reporting that tracks program progress and outcomes;
- **Approving the selection of independent auditors** to perform annual financial audits of the PRO;
- **Approving covered material exemptions** if a specific federal or state health and safety requirement prevents the material from being reduced or made reusable, recyclable, or compostable; and
- **Ensuring program compliance and enforcement,** including prohibiting the sale of products by producers who are not compliant.

In 2025 the MPCA confirmed registration of Circular Action Alliance (CAA) as the Producer Responsibility Organization (PRO) which will be responsible for:

- Implementing the program on behalf of producers;
- Developing stewardship plans (revised every five years) and annual reports that track program progress and outcomes;
- Collecting producer fees;
- Reimbursing service providers for collection, transfer, processing, administrative costs, and refill and reuse; and
- Providing technical assistance to producer members, ensuring they collectively meet statewide requirements and performance targets.

An Advisory Board made up of 17 voting members representing a broad scope of impacted parties and one non-voting representative from the MPCA is responsible for:

- Reviewing all program documentation, including the stewardship plans and annual reports; and
- Providing program guidance and recommendations to the MPCA and PRO.

Purpose of the Preliminary Assessment

The MPCA contracted with Eunomia to complete a Preliminary Assessment and Needs Assessment as required in the Packaging Waste and Cost Reduction Act (Minn. Stat. § 115A.144-115A.1463). The two assessments will gather critical information about packaging and paper product introduction, use and reuse, and management in MN that will inform the development of the EPR program statewide.

The Preliminary Assessment includes:

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The Preliminary Assessment sets the stage for the Needs Assessment. The Needs Assessment, unlike the Preliminary Assessment, must be repeated every five years. The Needs Assessment is the next report in this series due on December 31, 2026, and it will include:

- An official baseline for program measures and outcomes – including proposals for statewide requirements;
- Recommendations on where investments should be made in collection, sorting, and responsible markets;
- A recommended methodology for reimbursement rates for service providers;
- An evaluation of environmental improvements and accountability; and
- An assessment of best practices for education and outreach.

Structure of the Preliminary Assessment

The report is structured as follows:

- **Minnesota community profile:** Provides an overview of the demographics in MN, including an overview of population, population density, and urban/rural split. It also introduces the region groupings that are used throughout the report as a means of grouping data and explores covered entities across the state.
- **Methodology for data gathering:** Provides a high-level overview of the main data sources and data collection methods used in the Preliminary Assessment.
- **Recycling and composting programs:** Introduces the list of covered materials. Details the characteristics of recycling and composting programs, for each, outlining available data on service coverage, accepted materials, types of collection containers, and coverage of drop-off sites. Provides an overview of the waste infrastructure across the state, including transfer

stations, landfills, recycling facilities and composting facilities. Provides indicative insight into contractual arrangements.

- **Covered materials :** Provides an overview of covered material tonnages introduced by producers, as well as tonnages recycled by region.
- **Indicative :** Outlines indicative insight into service costs for recycling and composting.
- **End markets for covered materials**: Provides discussion surrounding the end markets for covered materials.

Minnesota community profile

Regions used in the Preliminary Assessment

The MN legislature has split the state into two regions within the Solid Waste Management Act (Minn Stat § Chapter 115A):

- The seven-county metro area, which includes counties of Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington; and
- Greater MN, which are all other counties outside the metro area.

For the purposes of this assessment, however, the state has been split into 6 regions. These regions use MN's planning areas[3] as a basis, but with the boundaries amended to avoid breaking up solid waste joint power agreements. These agreements enable the pooling of resources, often including sharing facilities and waste infrastructure. The counties organized under solid waste joint power boards and a solid waste management district are shown in Figure 2, and outlined in Table 1.

Figure 2: Map of Minnesota solid waste joint power districts

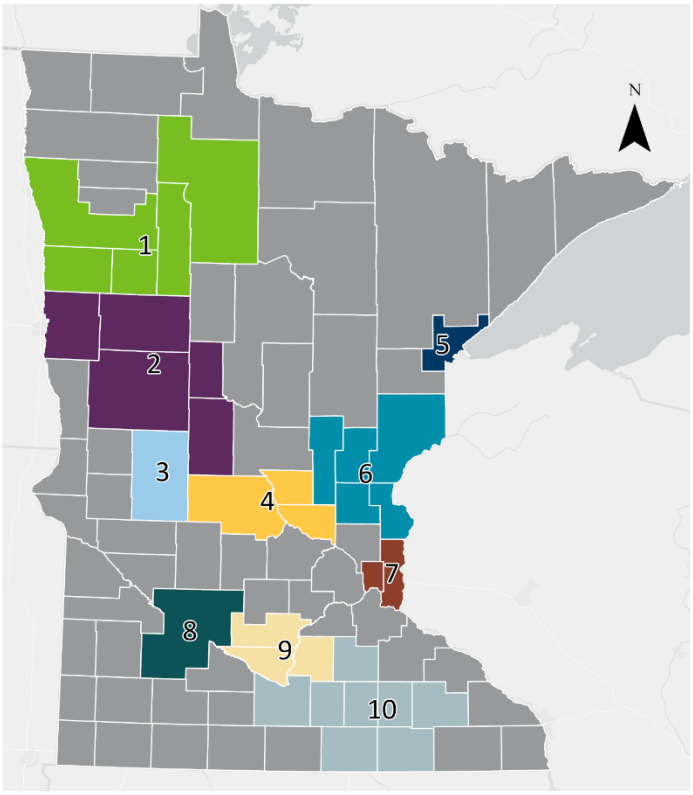


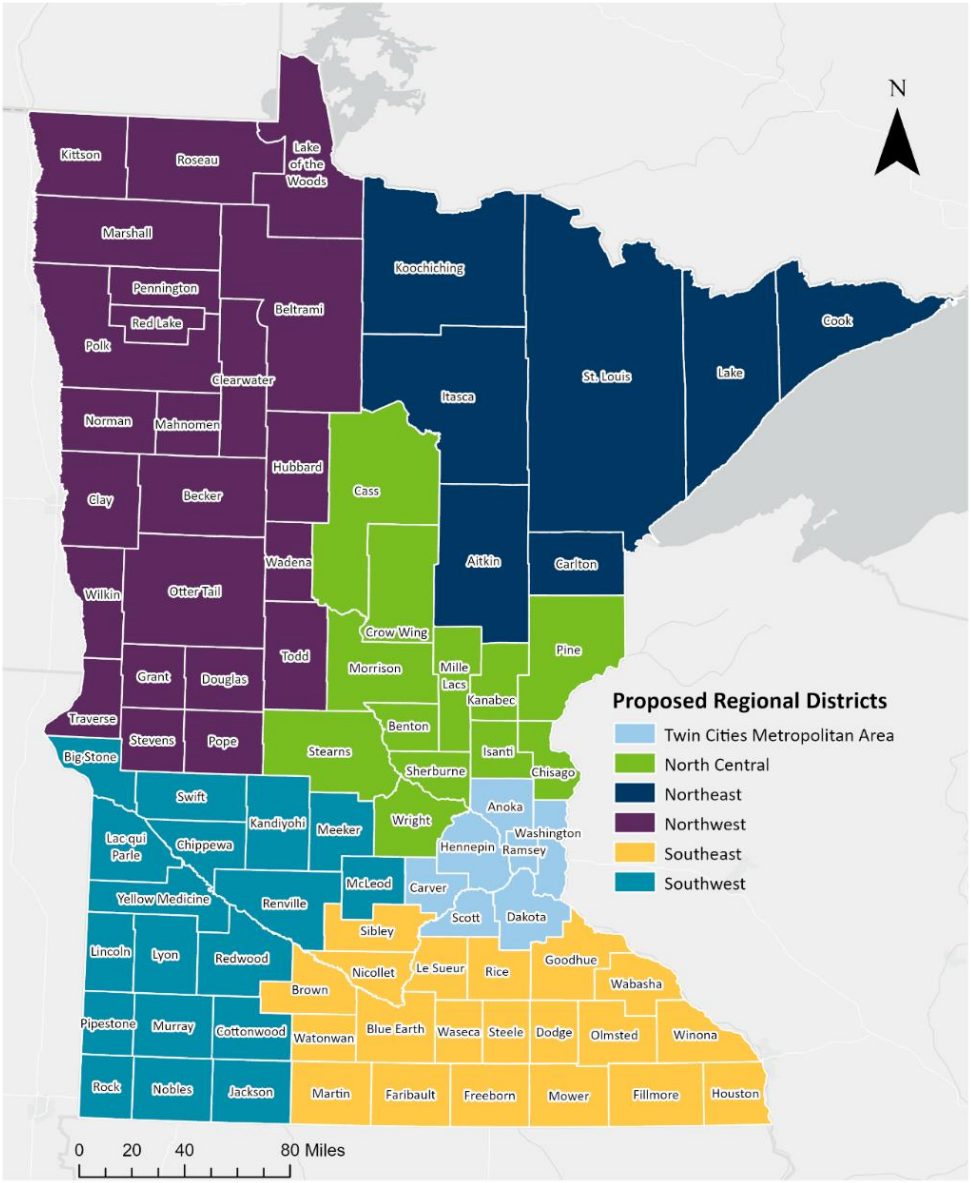
Table 1: Minnesota solid waste joint power districts

Joint Power District	Label
Five County Advisory Board	1
Prairie Lakes Municipal Solid Waste Authority	2
Pope/Douglas Solid Waste Management	3
Tri-County Solid Waste Management Commission	4
Western Lake Superior Sanitary District	5
East Central Solid Waste Commission	6
Ramsey & Washington Recycling and Energy Board	7
Redwood/Renville Regional Solid Waste Authority	8
Tri-County Solid Waste	9
The Southeast Minnesota Recyclers' Exchange	10

[3] Minnesota Government (n.d) apps.deed.state.mn.us/assets/lmi/areamap/plan.shtml (Accessed November 11, 2025)

The 6 regions used in this analysis are the Twin Cities Metro Area (TCMA), the Northeast Region (NE), the Northwest Region (NW), the North Central Region (NC), the Southeast Region (SE), and the Southwest Region (SW) and shown in Figure 3 along with the counties within each region.

Figure 3: Map of Minnesota Preliminary Assessment regions



Minnesota demographics

A goal of this assessment is to generate a shared understanding of the state of the current recycling and organics system for packaging and paper products. This assessment relies on data and information available in existing reporting and planning structures. Access to service, cost of service, and education are all key foundations to effective recycling and organics programs. Population density is a key aspect in the cost of collection service (as trucks have farther distances to drive) as well as access to transfer capacity, material recovery facilities, and markets. The Needs Assessment will complete an assessment

of current best practices to increase public awareness, educate, and complete outreach activities accounting for culturally responsive materials and methods.

Table 2 shows the distribution of MN's population across the 6 regions, showing how demographics vary across regions and highlighting the differences in population concentration and urbanization levels across the state. Table 2 also shows the percentage of MN's population that were living below the US Census's poverty thresholds in 2024 and the percentage of MN's population over 5 years of age whom English is not their first language.

Table 2: Minnesota population, population density, and urban/rural split by region in 2024

	TCMA	NE	NW	NC	SE	SW	Total
Population	**3,247,971**	**327,259**	**440,378**	**775,462**	**763,764**	**287,554**	**5,842,388**
Proportion of population	56%	6%	8%	13%	13%	5%	
Population Density (population/sq mile)	9,223	113	428	1,156	1,294	431	
Urban (% of population)	94.67%	51.66%	30.99%	49.26%	54.53%	30.36%	
Rural (% of population)	5.33%	48.34%	69.01%	50.74%	45.47%	69.64%	
Population Below Poverty Threshold (%)*[4]	8.48%	12.69%	11.57%	8.43%	9.76%	10.29%	
Population Over 5 whom English is not their first language (%)*[5]	6.26%	0.74%	1.59%	1.87%	3.77%	4.38%	

*Data here is for 2023 as 2024 US Census American Community Survey data is not yet available

The TCMA is the most populous region, with over 3.2 million residents, representing more than half of MN's population. This region also has the highest population density of over 9,200 persons per square mile and is predominantly urban with over 94% of residents in the region residing in urban areas, as classified as urban by the Census's Bureau which classifies areas with a population of at least 5,000 as urban.[6]

The NW and SW regions are the most rural with approximately 69% of their populations residing in rural areas. These regions also have much lower population densities, with the NW region having a population density of 428 persons per square mile and the SW region having a population density of 431 persons per square mile. The SE and NC regions exhibit more balanced distributions between urban and rural populations, showing a mix of cities and agricultural communities. They also have higher population density than seen in the NW and SW regions. The NE region also shows a balanced

[4] U.S. Census Bureau. (2024, December 12). *American Community Survey 5-Year Data (2009–2023)*. https://www.census.gov/data/developers/data-sets/acs-5year.html
[5] U.S. Census Bureau. (2024, December 12). *American Community Survey 5-Year Data (2009–2023)*. https://www.census.gov/data/developers/data-sets/acs-5year.html
[6] U.S. Census Bureau. (2024, December 16). *Urban and Rural.* https://www.census.gov/programs-surveys/geography/guidance/geo-areas/urban-rural.html

distribution between rural and urban populations; however, the population density in this region is significantly lower at approximately 113 persons per square mile.

The percentage of individuals living below the poverty threshold varies slightly by region. More than 10% of the populations in the NE, NW, and SW regions are living below the poverty threshold. The TCMA, NC and SE regions all have between 8% and 10% of their populations living below the poverty threshold. The share of residents by region whom English is not their first language also varies by region. It is highest in the TCMA at 6.26%, followed by the SW and SE regions at 4.38% and 3.77%.

Minnesota covered entities

Table 3 shows the number of covered entities across MN's regions. Households' data used in this section was aggregated from the US Census's American Community Survey[7], schools and childcare data was aggregated from MN GIS maps on school program locations throughout the state from the Minnesota Department of Educations[8], and non-profits and public buildings data was extracted using NAICs codes 81- Non-profit Organizations and 92 - Public Administration (the following public administration NAICs codes were excluded from as they were deemed to not be covered entities: executive offices, executive offices and legislative offices, combined, correctional institutions, parole offices and probation offices, spare research and technology, national security, and international affairs.[9]

According to MN's Packaging Waste and Cost Reduction Act, covered entities are defined as 'a person or location that received covered services for covered materials' and includes single family residences, multifamily residences, colleges, schools and childcare facilities, non-profit corporations with an annual revenue of less than $35,000,000, state agencies, political subdivisions, public areas, and public entities.[10]

The TCMA contains the largest share of covered entities throughout the state, reflecting its population density. There are over 932,000 single-family homes and 309,000 multi-family units in the region. The TCMA contains almost half the total number of universities, colleges, and K-12 schools and childcare facilities, at 900. There are over 1,450 non-profits and 770 public buildings and spaces in the TCMA.

Outside the TCMA, housing is more dispersed and primarily characterized by single-family homes. The NC and SE regions contain the highest number of single-family homes outside the TCMA with the NC region containing over 236,000 single-family homes and the SE region containing over 250,000 single-family homes.

Mobile homes account for approximately 57,000 units statewide. The TCMA, NW, NC, and SE regions all contain over 10,000 mobile homes while the NE and SW regions both contain less than 6,000 mobile homes. The SE region contains the highest number of schools and childcare facilities, non-profits and public buildings and spaces outside of the TCMA, followed by the NW and NC regions. The NE and SW

[7] United States Census Bureau. (2025, September 29). *American Community Survey (ACS)*. https://www.census.gov/programs-surveys/acs/
[8] Minnesota Department of Education. (2025). *Minnesota Department of Education*. https://education.mn.gov/mde/index.htm
[9] NAICS Association, LLC. (n.d.). *NAICS code & SIC identification tools*. https://www.naics.com/search/
[10] Minnesota Statutes § 115A.144 (2025). Retrieved from https://www.revisor.mn.gov/statutes/cite/115A/full#stat.115A.144

regions contain the smallest number of schools and childcare facilities and also the smallest number of residents.

Table 3: Number of covered entities by type and region in 2024

	TCMA	NE	NW	NC	SE	SW	Total
Households	**1,257,984**	**129,024**	**175,961**	**283, 139**	**305, 521**	**116, 541**	**2,265,170**
Single-Family (up to 4 units)	932,861	107,017	142,103	236,679	252,282	101,575	**1,772,517**
Multi-Family (5+ units)	309,449	16,097	23,510	34,603	40,232	11,550	**435,441**
Mobile Homes	15,674	5,910	10,348	11,857	10,007	3,416	**57,212**
Schools and childcare	**900**	**74**	**292**	**292**	**362**	**219**	**2,139**
Childcare	87	17	71	62	81	57	**375**
K-12 schools	773	55	207	220	263	151	**1,669**
Colleges & Universities	40	2	14	10	18	11	**95**
Non-profits*	1,451	64	234	241	308	135	**2,433**
Public buildings and spaces	774	166	475	410	636	348	**2,809**

*All Non-profits are included in this table and not just those with a revenue of less than $35,000,000.

Methodology for data gathering

This section describes the main sources of information used to inform this assessment. Further details are provided as appropriate throughout the report, outlining the methods used to compile and calculate data from these sources. The Preliminary Assessment – which gathers data on the existing waste management systems in operation across the state - draws to a significant extent on existing documentation and datasets. Key datasets include the following:

- **United States Census Bureau** and the **State of Minnesota State Demographic Center's data** on population, rurality, and housing stock characteristics;
- The **Minnesota Department of Education School Program Locations database** to provide locations of schools and libraries throughout MN;
- The **North American Industry Classification System (NAICS) data** provides locations of organizations by sector, particularly for public spaces and non-profit organizations;
- **MPCA service provider registration** provides information on the cost of collection, processing services, and transfer operations by those who are classified as a "service provider" in the Packaging Waste and Cost Reduction Act
- **MPCA SCORE reporting**, provided details on waste collection system performance (including collected tonnages) and information on county recycling and organics programs through a supplemental survey called the **program details** survey completed every five years by counties;
- **MPCA facility reporting** provides details on waste collection at permitted facilities in the state to track the flow of waste by material types (any data classified as proprietary by facilities was not shared, only public data was used to inform this report)
- **MPCA permit data** for facilities, providing details on location and capacity;
- **Solid Waste Management Plans (SWMPs)** – here data was only taken from plans that have been completed in the past 5 years, since waste collection systems change over time and older data might therefore not be representative of current systems and approaches; and
- Recent **stakeholder engagement activity undertaken by MPCA** as part of the **Resource Management Report**.[11]

In addition, information on covered material sales introduced by producers was informed by the registered PRO, CAA.

Counties in MN are required to develop SWMPs and routinely update them. These plans are required to include program details for recycling and composting (of both organics and yard waste). Table 4 shows the recent SWMPs available across the state (by region) which were used to inform the report. SWMPs from 32 counties were collected covering over 75% of statewide population. Older SWMPs were not used since the older SWMPs could describe program details which are out of date.

[11] Minnesota Government (n.d) MPCA Resource Management Report accessed November, 11 2025

Table 4: Availability of recent SWMP by region

Region	Counties with recent SWMP	Proportion of households in region covered by these plans
TCMA	Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington	100%
NE	Aitkin, Carlton, Cook, Itasca, Koochiching, Lake, St Louis, Western Lake Superior Sanitary District	100%
NW	Douglas, Pope, Traverse	13.5%
NC	Cass, Crow Wing, Sherburne, Stearns, Wright	66.3%
SE	Fillmore, Freeborn, Olmsted, Steele, Winona	40.8%
SW	Big Stone, Chippewa, Kandiyohi, Swift	24.8%
Statewide		**77.3%**

Data gaps

This assessment was used to identify key data gaps left from existing data collection and reporting structures in-place by state agencies and departments that can be leveraged for the implementation of the Packaging Waste and Cost Reduction Act.

Many of the sources of documentation did not provide complete coverage across all counties. For example, only 84 of the 87 counties completed the program details survey as part of SCORE reporting. The exclusion of SWMPs not updated within the past five years leaves an incomplete picture of programs in Greater MN. In addition, some program details needed for this assessment are not included by all counties in SWMPs.

Cities are the most common local government unit to have organized collection agreements for recycling service for their residents. There is no reporting to the state by cities or townships on recycling and organics programs. This creates a significant gap on both cost and programmatic details for this report. Registration of service providers, which includes local governments that have organized collection agreements with waste management companies was limited and not a robust data set to inform this report.

To provide cross-checks against the validity of the data obtained from these sources the project team:

- Contacted four of the MPCA's solid waste planners who regularly work with counties in Greater MN;
- Obtained details from the websites of haulers who are very active across the county, in addition to county and city websites aimed at providing information to residents; and
- Completed informal outreach with several facilities across MN, to help provide insight into MN's infrastructure.

The information provided in this Preliminary Assessment will be further elaborated upon in the next stage of the research – the Needs Assessment - which will include more substantial primary data collection through outreach to interested parties including the advisory board, counties, cities, and townships, service providers like haulers and MRF operators, CAA, and other interested parties like environmental and community organizations within the state.

Recycling and composting programs

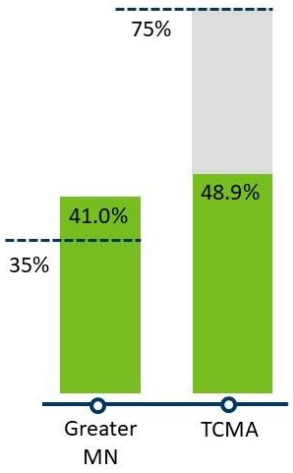
This section highlights the services currently in place for collecting and managing covered materials. It provides an overview of what covered materials include, the characteristics of recycling and composting collection programs, and outlines the infrastructure in place for the sorting and processing of covered materials.

Recycling legislation and requirements in Minnesota

Minnesota's Waste Management Act establishes a foundation that has created the recycling programs in existence today. Minnesota's waste management is guided by a waste management hierarchy established in law (Minn. Stat. 115A.02), which puts waste reduction and reuse as the first order of priority followed by recycling and composting.

In 2014, the state legislature updated the recycling targets for counties in the TCMA to achieve a 75% recycling rate by 2030, based on the total weight of solid waste generated (Minn. Stat. § 115A.551). For counties in Greater MN the goal is 35%, as seen in Figure 4

Figure 4. Progress toward recycling targets set by MN Legislature



In 2023, the statewide combined organics and recycling rate was 45.3% percent with Greater MN counties achieving a 41% rate and counties in the TCMA achieving a 48.9% rate.

The Waste Management Act establishes funding mechanisms for recycling including SCORE funding (Minn. Stat. § 115A.557), capital assistance project funding (Minn. Stat. § 115A.54), and state waste management bonds (Minn. Stat. § 115A.58). The combination of these funding streams supports reliable funding streams for programmatic costs as well as public solid waste infrastructure projects.

The MPCA has multiple reporting requirements including an annual report from counties (SCORE report), reporting from haulers (Minn. Stat. § 115A.93), and reporting from facilities to track the flow of MSW in the state. In future years a waste composition study requirement (Minn. Stat. § 115A.412) will go into effect. It directs owners and operators of most waste facilities in the state to complete waste composition studies on a rotating schedule. This waste composition requirement builds on an existing practice of routine waste composition studies at waste-to-energy facilities as part of air permit requirements.

The Waste Management Act also includes a range of programmatic policy like establishing solid waste management plans (Minn. Stat. 115A.46), collection licensing (Minn. Stat. § 115A.553), and requiring volume- or weight-based pricing (Minn. Stat. § 115A.9301).

The Opportunity to Recycle law (Minn. Stat. § 115A.552) requires all counties to ensure that all residents have an opportunity to recycle (curbside, drop-off sites, or an environmental center). It states that an opportunity to recycle must include:

1. An environmental center in the county and sites for collecting recyclable materials that are convenient;
2. Curbside pickup, centralized drop-off, or an environmental center for recycling in cities with a population of 5,000 or more people; and

3. Monthly pickup of recycling in cities with more than 20,001 people (cities of the first or second class) and in the TCMA, cities with 5,000 or more people.

There are also recycling requirements for sports facilities and certain commercial buildings (Minn. Stat. § 115A.151).

MPCA also has dedicated market development staff along with frequent recycling market grants including $5.3 million to 11 grant recipients in 2024 to bolster local markets.

Specific to the TCMA is the metropolitan long range policy plan for solid waste management (Minn. Stat. § 473.149). This plan sets goals and policies for the metropolitan solid waste system. Including in the most recent plan establishing mandatory pre-processing of waste at waste-to-energy (resource recovery) facilities and landfills by 2030 and make residential curbside organics collection available in cities with a population greater than 5,000 by 2030.

The state also has a Recycling Education Committee, which is a public-private partnership to develop acceptable material lists across the states based on input from MRFs and educators as well as an engaged Minnesota Composting Council that has complimented this work for organics recycling.

The Packaging Watse and Cost Reduction Act is a next step in establishing MN as a leader in moving materials up the waste management hierarchy.

Covered material categories for Preliminary Assessment

For the Preliminary Assessment, covered materials are broken down by material types and categories as set out in Table 5, reflecting currently or recently introduced and covered material types. This is a preliminary list that will be further developed and refined as part of the Needs Assessment. Due to limitations of available data, this list was further refined for the purposes of this report (Table 6).

Table 5: Provisional covered materials list, by material type and category

Material type	Material category
Paper	Corrugated Cardboard and Boxboard
	Newspaper and Magazines*
	Mixed Paper
	Other Paper
	Gable-top and Aseptic Cartons
Plastic	Plastic PET #1 Bottles
	Plastic PET #1 Non-Bottle
	Plastic HDPE #2 Bottles
	Plastic HDPE #2 Non-Bottle colored and natural combined
	Plastic PP#5
	Plastic PS #6
	Plastic Mixed Plastics Rigid #3-#7
	Plastic Film and Flexibles
Glass	Glass Bottles and Jars
	Glass Non-container
Metal	Aluminum Cans
	Aluminum Other
	Steel Cans
	Steel Other
Compostable	Compostable Paper
	Plastic Compostable

*Newspapers and magazines only include newspaper and magazine print publications related to news and currents events and small magazine with less than 95,000 in circulation.

Current data on collection system performance is based on information in the MPCA's SCORE report[12], which collates data on materials collected for recycling by county for 2023, based on reported data from the counties. Data reported through SCORE reporting is used within this assessment since it is the most recent and comprehensive data available in a relatively consistent format across the state.

[12] MPCA, 2025, 2023 SCORE Report, Available at: Workbook: SCORE report 2023

There are some limitations to the data collected through SCORE reporting. Counties have variable ability to report accurately by material-type as they are not a primary source for this information. In addition, different counties report different materials against each material category e.g. some counties report all rigid plastics under the material category 'mixed plastic containers and rigids', while other counties split out PET and HDPE but report all other polymers under 'mixed plastic containers and rigids'.

To this end, the following adjustments were made to the SCORE data:

- For SCORE material categories that most counties reported against, tons are reported in this Preliminary Assessment as per the SCORE data;
    - This includes boxboard and cardboard, aseptic containers and drink boxes, plastic wraps, and film, aluminum cans, and aluminum.
- Where only a few counties reported against a SCORE material category, these materials were grouped together to form a higher tier material category;
    - For example, tons of mixed glass containers, brown glass containers, clear glass containers, green glass containers, and reusable glass containers were all grouped into an overall Glass Containers category;
    - The groupings used for all materials are detailed in Table 6.
- Some counties did not report PET and HDPE separately and reported all rigid plastics under one category. An assumption was applied to separate out PET and HDPE for these counties; and
- Ferrous metal tons were assumed to include scrap metal as well as packaging materials, as tons reported in SCORE were very high. Therefore, 63% of ferrous tons were assumed to be scrap, based on MRF composition data, and were removed from the ferrous tons reported in this Preliminary Assessment.

These adjustments mean that reporting in this Preliminary Assessment has been done using the material categories in Table 6. These material categories were mapped as closely as possible with the covered materials above (Table 5). For some categories it was not possible to break down tons to the same level of detail as those in Table 5 at this stage without obtaining further waste composition data from facilities. A new statewide waste characterization study is being carried out, assuming this is complete in time, the data obtained from it will be used to inform the Needs Assessment.

The Packaging Waste and Cost Reduction Act does not include a waste composition study specific for covered materials to inform the Preliminary Assessment or Needs Assessments.

Table 6: SCORE data availability and mapping to covered material types and categories

Material Type	Material Category for Reporting	SCORE Categories Included in Material Category	SCORE data availability
Paper	Cardboard (OCC and Boxboard)	Boxboard and Cardboard	85 counties report against this in SCORE so there is good data available on this category
	Newspaper and Print	Catalogs and Magazines Newspaper Phone Books	Included and good coverage in SCORE data; however, some of this material category is excluded from covered materials as listed in the Bill 115A.1441 DEFINITIONS. Sub. 16. Exempt Materials
	Other Paper	Office Paper Mixed Paper Shredded Paper Kraft Paper Bags Plastic Lined Paper Bags	The breakdown of paper products was reported to varying levels by the different counties in SCORE. Therefore, these were combined into a 'other paper' category
	Cartons	Aseptic Containers and Drink Boxes	10 counties reported cartons separately in SCORE
Plastic	#1 PET	PET Bottles	Only 48 counties report against PET Bottles in SCORE, so assumptions were applied to other counties to split out #1 PET bottles from mixed rigid plastics
	#2 HDPE	HDPE Bottles - Natural HDPE Bottles - Colored HDPE - Injection Grade	Only 44 counties report to this level in SCORE, so assumptions were applied to other counties to split out #2 HDPE bottles from mixed rigid plastics
	Other Mixed Rigid Plastics #3 – #7	Mixed Plastic Containers and Rigids PP Bottles, Containers, and Bulky PS Rigids EPS Block Shapes and Foam Food Service LDPE Tubs and Lids PET Clam Shells	Very few counties report down to the individual polymer level, so these were combined into a mixed category. 42 counties only reported against mixed plastic containers and rigids in SCORE. An assumption was applied to split out #1 PET and #2 HDPE
	Flexible Plastics (Mixed Bags, Wraps and Film)	Mixed Retail Bags, Wraps, and Film	This includes mixed retail bags, wraps and film, but excludes ag film and boat wrap, which is not included in the covered materials
Glass	Glass Containers	Mixed Glass Containers Brown Glass Containers Clear Glass Containers Green Glass Containers	81 counties report total container glass in SCORE, with only 3 counties splitting container glass by color. Reusable glass containers were only reported by one county so have been included in this category

		Reusable Glass Containers includes Growlers Beverage Bottle Washing etc.	
	Non-Container Glass	Non-Container Glass	Covers any other glass reported
Metal	Aluminum Cans	Aluminum Cans	68 counties reported aluminum can tons in SCORE providing good data coverage
	Aluminum	Aluminum Food Service Ware replacing single use includes Silverware Trays Cafeteria Bowls Plates etc.	57 counties reported aluminum tons in SCORE, although it is not clear if some of these tons are aluminum cans where these were not separately reported. Food service ware was assumed to be primarily aluminum. Only 2 counites reporting very low tons against this category
	Ferrous Metals	Ferrous Metals	79 counties reported ferrous metals in SCORE so there is good data available on this category. A proportion was assumed to be scrap metal and was removed from the SCORE reported tons.

In addition to the packaging and paper collected as part of the recycling programs, some packaging and paper is compostable and will ultimately need to be treated through organics programs that collect SSO to be recycled. Most of the compostable packaging is likely to be food packaging. Analysis carried out on behalf of the MPCA in 2022 provides data on the proportion of Mixed Municipal Solid Waste (MMSW) that is compostable packaging (comprising both compostable paper and plastics).[13] The study used waste sampling to obtain data on the following waste streams:

1. Compostable paper and packaging;
2. Edible food (packaged);
3. Liquid and packaging from opened or expired food;
4. Inedible food (unpackaged); and
5. Edible food (unpackaged).

Food and compostable paper and packaging accounted for 27% of the total MMSW stream, with compostable paper and packaging making up 7% of total MMSW.

[13] RRS / GRG Analysis (2022) Food Waste Generation and Composition Study Analysis, Report for the MPCA

Characteristics of recycling programs

Recycling service characteristics

This section sets out the characteristics of the recycling programs and looks at recycling ordinances for residents and haulers across MN. Information presented here was gathered from county SWMPs updated in the last 5 years and discussions with MPCA solid waste planners. This was supplemented where necessary by data from the websites of key haulers providing services across MN.

Data is provided on both household services and commercial services. In considering these services, it should be noted that larger multi-family dwellings (usually 5+ units) are typically serviced by commercial waste service providers. Commercial waste collection services providers also provide waste collection to commercial entities covered under the bill[14] such as childcare centers, schools, some non-profit organizations, and public buildings and spaces.

Collection of recyclables is provided by several different methods in MN including:

- Single-stream collection whereby all recyclables are placed in one container and no further sorting by the resident is necessary is the most common;
- Dual-stream method asks residents to sort recyclables into two categories, usually fiber (paper and cardboard) and containers (bottles and cans); and
- Source separated requires separation of recyclables into three or more groups (see examples below).

Single stream recycling is the most prominent collection system across MN. Counties identified as not having single stream include:

- **Cass County** (NC Region): drop-off sites have source separated collection in multiple streams: mixed paper and metals, plastics, and glass;
- **Becker County** (NW Region): drop-off sites have source separated collection in three streams: glass, commingled metal and plastic containers, and mixed paper. Curbside residential recycling is single-stream, without glass. Commercial collection will transition to single-stream in 2026, but is currently source separated;
- **Clay County** (NW Region): drop-off sites have source separation of glass from other recyclables;
- **Mower County** (SE Region): drop-off sites have source separation into four streams: plastic containers, cardboard, mixed paper, and glass and cans; and
- **Otter Tail County** (NW Region): drop-off sites have source separated collection in five streams: glass, cans, paper, cardboard, and plastics. Otter Tail County is beginning to roll out single-stream curbside recycling in 2026, with glass source separated.

A complete review of all counties will be completed for the Needs Assessment and expanded to review city-level recycling programs and services.

Some cities throughout MN have ordinances requiring residents to recycle and some cities also have ordinances in place requiring haulers to provide recycling collection services. Table 7 shows the number of cities by region that have recycling ordinances in place. The data presented in this table was aggregated from a county level SCORE program details survey which was completed by 84 of 87 counties.

[14] Minnesota Statutes § 115A.144 (2025). Retrieved from https://www.revisor.mn.gov/statutes/cite/115A/full#stat.115A.144

Reporting on city activities is most common in counties in the TCMA. Counties reported to the MPCA that over 130 cities in the TCMA have ordinances requiring residents to recycle and over 175 cities having ordinances requiring haulers to provide recycling collection services.

Despite known ordinances at the municipal level, there are no reported recycling ordinances for residents or haulers in cities within the NE, NW, SE, and SW regions.

Table 7: Number of cities by region with ordinances requiring residents to recycle and requiring haulers to provide recycling collection services

	TCMA	NE*	NW*	NC	SE	SW	Total
Resident Recycling Ordinances	136	0	0	23	0	0	159
Hauler Recycling Ordinances	179	0	0	0	0	0	179

*Data used in this table includes information from 84 of 87 counties, counties missing are in the NE and NW region.

Recycling service coverage

This section outlines the characteristics of recycling service coverage across MN, focusing on the extent to which cities have access to organized curbside collection, open market collection, or drop-off only recycling services. The data presented in Table 8, Table 9, and Table 11, was aggregated a county level SCORE program details survey . The data is not representative of the state population by service-type and does not include information from Koochiching County in the NE region and Polk County and Todd County in the NW region as representatives from these counties did not complete the survey. Responses from Pope County and Douglas County were grouped together as well as Redwood County and Renville County and quantitative response have been split based on population. This section refers to cities instead of municipalities as this was the terminology used in the survey, but it cannot be guaranteed that responses only reflect cities and not municipalities.

Table 8 shows the percentage of cities in each region served by each curbside recycling collection service type – showing the proportion of organized collection, open market collection, or drop-off only recycling access in each region. The percentage of cities with open and organized curbside recycling collection services was calculated by taking the number of cities in each county with open and organized recycling collection services and dividing them by the total number of cities in each county. The percentage of cities with drop-off only recycling services was calculated by taking the number of cities in each county with no curbside collection services – but that have a drop-off site collection - by the total number of cities in each county. The above calculations were then aggregated at a regional level. The table shows significant regional variation in recycling services across the state which reflects differences in population densities, local government structures, and available infrastructure.

All cities in the TCMA and the NE and SW regions have curbside recycling collection services or drop-off recycling services. TCMA has the highest percentage of cities with organized collection services (51%) where municipalities or counties contract directly with haulers for household curbside recycling services and only 20% of cities in the region do not have access to curbside collection systems. Although all cities in the NE and SW regions have access to recycling services, over 90% of those in the NE region and 66% of those in the SW region only have access to these services through drop-off only. Cities in the NW and SE regions also predominantly only have access to recycling services through drop-off sites; in both regions a relatively small percentage of city populations do not have access to recycling services.

The table also shows that approximately 24% of cities in the NC region have access to open curbside recycling collection services where residents independently choose and contract with haulers. Over 43%

of cities in the NC region only have access to recycling services through drop-off sites and over 23% of cities do not have access to recycling services.

Interviews with MPCA solid waste planners confirmed that, in general, it is common for residents in more urban areas to have curbside recycling collection and residents in more rural areas to utilize drop-off sites.

Table 8: Number of and percentage of cities in each region with open market curbside collection, organized contract curbside collection, or drop-off only recycling collection services

	TCMA	NE*	NW*	NC	SE	SW
Organized	98	5	26	35	129	160
	50.78%	1.98%	3.51%	8.29%	24.34%	28.62%
Open	57	19	51	103	32	29
	29.53%	7.51%	6.88%	24.41%	6.04%	5.19%
Drop-off Only	38	229	645	183	348	370
	19.69%	90.51%	87.04%	43.36%	65.66%	66.19%
No Recycling Collection or Drop-off Services	0	0	19	101	21	0
	0.00%	0.00%	2.56%	23.93%	3.96%	0.00%

*Data used in this table is not representative of the state population by service-type and includes information from 84 of 87 counties, counties missing are in the NE and NW region.

Table 9 below shows the percentage of residents served by curbside recycling collection services by region in MN. This data was calculated by dividing the number of residents per county served by curbside recycling collection programs by the total number of residents per county. The data was then aggregated at a regional level. Over 75% of residents in the TCMA and the NC and SE regions are served by curbside recycling collection services. This aligns with expectations for the TCMA region; however, service provision was less than expected in the NC and SE regions and shows that cities within these regions with curbside recycling collection services are more densely populated. Similarly, over 65% of the residents in the SW region are served by curbside recycling collection services while only approximately 34% of the cities within this region have recycling collection services.

Only approximately 12% and 36% of residents in the NE and NW regions are served by curbside recycling collection programs which is reflected in Table 8 where over 90% of the cities in the NE region and 87% of the cities in the NW region are dependent on drop-off sites for recycling.

Table 9: Residents served by curbside recycling collection programs by region (%)

	TCMA	NE*	NW*	NC	SE	SW
% of Residents	75.19%	12.19%	36.29%	75.65%	75.29%	65.30%

*Data used in this table is not representative of the state population by service-type and includes information from 84 of 87 counties, counties missing are in the NE and NW region.

The most common collection frequency of curbside recycling collection service provision across MN is every other week, with ~63% of households receiving this collection frequency based on information in county SWMPs. Interviews with MPCA solid waste planners confirmed that every other week collection is typical and collection frequency varies across the state. Weekly recycling collection is required in Dakota County by ordinance. Once a month collection frequencies were found to be more common in

rural versus urban areas; however, MPCA solid waste planners indicated that some municipal request bids for collection service have gone unanswered because haulers will not bid on contracts that are less frequent than every other week due to cost concerns. Further variation in collection frequency may be due to consumer preference: MPCA solid waste planners indicated that in areas where there is an open market, residents may choose to pay more for a weekly collection.

Types of collection containers used

Interviews with MPCA solid waste planners confirmed that the most common collection container for curbside recycling is a 96-gallon cart. For multifamily and some rural areas, dumpsters are used. Some outliers to this norm include:

- **Swift County:** utilizes a 3-bag system for trash, recycling, organics; and
- **Mower County:** utilizes totes because they source separate all materials

Some areas trialed using carts smaller than 96-gallons when first rolling out single stream recycling; however, when services were provided every other week smaller carts were insufficient to hold the volume of recyclables.

Additional research on hauler websites and SWMPs indicates that 64-gallon and 32-gallon carts are also available in some areas and are usually linked to lower service costs to households.

Commonly accepted materials for recycling

The Minnesota Recycling Education Committee (REC) created the Recycling Outreach Guide for MN, which details the accepted and not accepted materials for different recycling programs. Table 10 details the commonly accepted materials for single-sort or single-stream recycling programs. The materials are broken into five categories: plastic, glass, cartons, metal, paper.

Table 10: REC Guidelines for single-sort or single-stream recycling[15]

Accepted	Not Accepted	Maybe Accepted
Plastic		
• #1, #2 containers, bottles and jugs such as: Soda, juice and water bottles, Milk and juice jugs ,Ketchup and salad dressing bottles, Dishwashing and laundry product bottles and jugs, Shampoo, soap and lotion bottles, Yogurt, pudding and fruit cups, Margarine, cottage cheese, cream cheese and other tubs and lids, Clear berry and produce containers,	• #3, #4, #6, #7 plastic • Plastic straws • Pumps and sprayer tops from bottles • Utensils • Styrofoam™, foam cartons, and foam packing material • Chip bags, granola and candy wrappers • Garden hoses • Bulky rigid plastics (ex: Kiddie pools, laundry baskets, window blinds)	Accepted for recycling at the majority of MRFs, but one or more MRFs (outside the TWMA) do not accept them: • #5 containers like yogurt, pudding and fruit cups, margarine, cottage cheese, cream cheese and other tubs and lids and some deli containers NOT accepted for recycling at the majority of MRFs, but one or more MRFs do accept them: • Black containers and bottles • Clear, rigid packaging from toys, electronics and other products

[15] See https://www.recycleminnesota.org/uploads/1/5/1/5/151529420/rec_outreach_guide_4_final.pdf

Clear plastic egg cartons, Clear to go cups • #5 containers, bottles and jugs such as: Soda, juice and water bottles, Milk and juice jugs ,Ketchup and salad dressing bottles, Dishwashing and laundry product bottles and jugs, Shampoo, soap and lotion bottles, Clear berry and produce containers, Clear plastic egg cartons, Clear to go cups	• Microwaveable food trays • Motor oil and other containers that held hazardous products • Pouches • Toys • Plastic gloves • Meal prep packaging • Drink pouches	NOT accepted for recycling at any MRF, but commonly collected for recycling at specialty drop-off locations: • Plastic bags, film, and wrap • Tyvek envelopes
Glass		
• Food and beverage bottles and jars	• Ceramics/pottery • Drinking glasses • Glass dishes • Mirrors • Vases • Window glass • Glass bakeware • Nail polish and hobby paint containers	Accepted for recycling at the majority of MRFs, but one or more MRFs do not accept them: • Mason jars NOT accepted for recycling at any MRF, but commonly collected for recycling at specialty drop-off locations: • Light bulbs
Cartons (aseptic and gable-top cartons)		
• Clear plastic egg cartons	• Ice cream cartons • Plastic coated paper takeout cartons • Foam egg cartons • Foil drink pouches	Accepted for recycling at the majority of MRFs, but one or more MRFs do not accept them: • Milk and juice cartons • Juice boxes • Soup, broth and wine cartons NOT accepted for recycling at the majority of MRFs, but one or more MRFs do accept them: • Paper egg cartons
Metal		
• Food and beverage cans • Decorative popcorn and cookie tins	• Batteries	Accepted for recycling at the majority of MRFs, but one or more MRFs do not accept them: • Aluminum foil (must be clean) • Aluminum trays, tins, or pie tins (must be clean) NOT accepted for recycling at the majority of MRFs, but one or more MRFs do accept them: • Aerosol cans (e.g. shaving cream)

		• Cardboard can (i.e. oatmeal container or crescent roll container) NOT accepted for recycling at any MRFs, but commonly collected for recycling at specialty drop-off locations: • Containers that held hazardous products such as paint thinner • Holiday lights • Loose metal caps • Paint cans • Pressurized cylinders like propane and helium tanks • Scrap metal, such as pots and pans, hangers, shelves, nails, auto parts, pipes and poles • Wire NOT accepted for recycling at any MRF, but commonly collected for recycling at specialty drop-off locations: • Hazardous aerosols
Paper		
• Cardboard • Cereal and cracker boxes • Magazines, catalogs, newspapers and inserts • Mail, office and school papers • Phone books and other soft cover books • Shoe boxes, gift boxes, tissue boxes and electronics boxes • Cardboard tubes from toilet paper, and paper towels (only the inner cardboard tube is recyclable, NOT the paper on the roll) • Toothpaste, medication and other toiletry boxes • Refrigerator boxes	• Greeting cards that are shiny, play music, contains aluminum foil or plastic • Paper berry cartons • Paper cups, plates and bowls • Paper napkins or towels • Paper soiled with food or grease • Shipping envelopes padded with bubble-wrap • Tissue paper • Waxed cardboard (such as bulk produce boxes) • Wrapping paper	Accepted for recycling at the majority of MRFs, but one or more MRFs do not accept them: • Freezer boxes (most boxes today are pure boxboard without a plastic lining or plastic fibers, making them recyclable) • Pizza delivery boxes (for more info see the FAQ section on page 33) • Cardboard cans (i.e. oatmeal container or crescent roll container) • Unlined Kraft paper such as used for shipping padding (flatten and place in a paper bag for best results) NOT accepted for recycling at the majority of MRFs, but one or more MRFs do accept them: • Hardcover books • Paper egg cartons • Shredded paper • Cardboard cans with metal lids • Lined kraft bags • Padded paper shipping envelope NOT accepted for recycling at most MRFs, but commonly collected for recycling at specialty drop-off locations: • Shredded paper

Coverage of recycling drop-off collection sites

Table 11 shows the number of recycling drop-off sites by region in MN. The table shows that recycling drop-off infrastructure is more concentrated in rural regions, where curbside collection services are more limited. The NW region has the greatest number of recycling drop-off sites (191), followed by the SW regions (127), and the SE and NE regions (107 and 104).

The TCMA has 23 drop-off sites, as reported by counties, despite having the state's largest population. This is because of the region's extensive curbside collection coverage which is shown in Table 8. The NC region only has 43 drop-off sites; however, 23% of cities in this region are not served by recycling collection services or drop-off sites and approximately 76% of residents are served by recycling collection programs.

Table 11: Number of recycling drop-off sites by region

	TCMA	NE*	NW*	NC	SE	SW	Total
Number of Drop-off Sites	23	104	191	46	107	127	598

*Data used in this table is not representative of the state population by service-type and does includes information from 84 of 87 counties, counties missing are in the NE and the NW regions.

Capacity at drop-off sites is scalable. Drop-off sites are equipped with carts, dumpsters, or roll-offs and capacity can adjust by adjusting the frequency of service of collection containers.

Characteristics of composting programs

Organics and yard waste collection service characteristics

This section outlines the characteristics of organics and yard waste programs across the state. Organics management systems (composting or other methods of organic waste treatment) are required to recycle compostable packaging and paper. Compostable packaging and paper likely to be collected through systems that accept and treat source-separated organics (SSO), which is referred to as "organics" (sometimes referred to food scraps collection). Information was gathered from recent county SWMPs, permit data, a county level SCORE program details survey, and through discussions with MPCA solid waste planners. This was supplemented where necessary by data from the websites of key haulers and county information providing services across the state.

The data used in Table 12, Table 13, and Table 14 was aggregated from a county level SCORE program details survey. The data is not representative of the state population by service-type and includes information from 84 of 87 counties, with data missing from counties in the NE and NW region. Responses from Pope County and Douglas County were grouped together as well as Redwood County and Renville County and quantitative response have been split based on population. This section refers to cities instead of municipalities as this was the terminology used in the survey, but it cannot be guaranteed that responses only reflect cities and not municipalities.

Table 12 shows the percentage of cities in each region served by each type of service – whether this is an organized collection, open market collection, or drop-off only access. In most regions of Greater Minnesota, the cities have relatively limited access to organics collection; however, in the TCMA, all cities have access to organics collection services or organics waste drop-off services. Since the TCMA region accounts for 56% of the population of the state, the data suggests that considerably more than half of state residents have access to some form of organics collection service, although for the majority this is in the form of a drop-off service.

Table 12: Number of and percentage of cities with organics collection service by type by region in 2024

	TCMA	NE*	NW*	NC	SE	SW
Organized	53	0	0	5	8	2
	27.46%	0.00%	0.00%	1.18%	1.51%	0.36%
Open	12	0	9	5	23	0
	6.22%	0.00%	1.21%	1.18%	4.34%	0.00%
Drop-off Only	128	34	289	179	157	79
	66.32%	13.44%	39.00%	42.42%	29.62%	14.13%
No SSO /Unknown	0	219	443	233	342	478
	0.00%	86.56%	59.78%	55.21%	64.53%	85.51%

*Data used in this table is not representative of the state population by service-type and includes information from 84 of 87 counties, counties missing are in the NE and NW region.

In MN, yard waste cannot be placed in MSW or sent to a landfill or waste-to-energy facility (Minn. Stat. 115A.931), because of this prohibition there is a robust collection system for yard waste throughout the state. Understanding this collection network may help identify opportunities for small-site composting to help manage compostable packaging and paper. Compostable paper yard waste bags are also a covered material under the Packaging Waste and Cost Reduction Act.

Table 13 shows the number of yard waste collection programs in MN by region. The TCMA has the greatest number of programs (93) followed by the SW region (22). The NE, NW, NC and SE regions each have less than 10-yard waste collection programs throughout the region.

Table 13: Number of yard waste collection programs in Minnesota by region in 2024

	TCMA	NE*	NW*	NC	SE	SW	Total
Number of Collection Programs	93	1	8	4	5	22	133

*Data used in this table is not representative of the state population by service-type and does not includes from 84 of 87 counties, counties missing are in the NE and NW region.

Table 14 shows the percentage of residents served by both organics and yard waste curbside collection services in MN by region. This confirms that the region with the highest proportion of residents being served by both organics and yard waste curbside collection services is the TCMA. The TCMA accounts for 56% of the statewide population and 61% of the residents with access to organics curbside collection.

Table 14: Residents served by organics and yard waste curbside collection services by region in 2024

	TCMA	NE*	NW*	NC	SE	SW
SSO Curbside Collection Programs	15.03%	0.00%	0.00%	2.81%	2.87%	3.88%
Yard Waste Curbside Collection Programs	29.46%	0.31%	18.34%	10.02%	3.40%	14.46%

*Data used in this table is not representative of the state population by service-type and does not includes from 84 of 87 counties, counties missing are in the NE and NW region.

Organics collection programs – where they exist – rely heavily on drop-off sites to provide access to residents. The MPCA has set a requirement in the most recent Metropolitan Solid Watse Management Policy Plan requiring all TCMA counties to offer residential, curbside organics collection in cities with populations above 5,000 by 2030.[16] Hennepin County has the most expansive organics program with 20 cities offering curbside collection. Examples of organics collection in the TCMA area:

- **Hennepin County:** Since 2022 all cities with 10,001 or more inhabitants are required to offer curbside organics collection or require haulers to provide curbside collection of organics. Cities with 10,000 inhabitants or less must establish a drop-off collection site for organics.
- **Ramsey and Washington Counties:** Since a pilot program started in 2023, these counties are in the process of rolling out a food scrap collection system. This uses a weekly collection system that will separate the durable food scraps bags from the trash at the Recycling & Energy Center or contracted transfer stations, using robot AI arms to remove the durable food scraps bags from the trash. Bags are provided free of charge to residents, and coverage is for households in both multi-family and single-family dwellings.
- **Anoka County:** Curbside organics collection is not offered county-wide. Residents within several municipalities have an option for curbside organics collection.
  - Circle Pines, Columbia Heights, and Fridley have organized collection for organics collection service. Circle Pines offers a 35-gallon cart, with a cost of $7.50 a month.[17] Columbia Heights offers 7-gallon containers, with a cost of $13.38 a quarter.[18] Fridley offers a 32-gallon cart, with a cost of $12.16 a month.
  - Coon Rapids and Lino Lakes residents can access curbside organics collection if they have Walters as their waste hauler.
- **Carver County**: Curbside organics is not offered county-wide. There are drop-off sites in the county available for residents to use. Curbside collection services are being piloted to a limited number of Chaska and Chanhassen residents, this program will discontinue at the end of 2025
- **Dakota and Scott Counties**: Curbside organics is not yet offered in the county. There are drop-off sites available for residents to use.

There are some Greater MN counties which are known to provide organics curbside collection to at least some of the county's residents:

- **Mcleod County (SW region):** The City of Hutchinson collects commingled organics and yard waste. The city owns the compost site, and it is the only known facility in the state that commingles organics and yard waste.
- **Rice (SE region):** Northfield Curbside Compost[19] provides curbside collection to residents in their service area using 5-gallon buckets
- **Goodhue County (SE region):** The City of Redwing piloted curbside organics collection and did not continue the program.

[16] See https://www.pca.state.mn.us/sites/default/files/w-sw7-22.pdf
[17] See https://www.ci.circle-pines.mn.us/organics
[18] See https://www.columbiaheightsmn.gov/departments/public_works/refuse_and_recycling/yard_waste_organics.php
[19] See https://www.curbsidecompostmn.coop/about-us/

Also in the Greater Minnesota area, Western Lake Superior Sanitary District (which serves the Duluth area) requires restaurants, colleges, hospitals, nursing homes, assisted living facilities, food processors, and caterers operating within the district to separate and recycle pre-consumer food waste.[20]

Types of collection containers used

In terms of the types of collection containers used, curbside containers for organics collection are typically 32-gallon while yard waste and drop-off containers are generally 96-gallon. As was described above, Ramsey and Washington counties use durable compostable bags co-mingled with trash service; a similar system is also in operation for some cities in Hennepin and Anoka counties.

Other containers referenced by MPCA solid waste planners include totes and clear bags. For organics, Swift County residents are instructed to leave the clear bags untied so that they can be easily emptied by the collection service. The City of Lino Lakes in Anoka County also uses a bag system for organics. Lino Lakes instructs residents to use BPI certified compostable bags that are tied and placed on top of trash inside the trash cart for curbside pickup. These are the only two programs using bags that were indicated through regional planner interviews and may be an incomplete list.

Commonly accepted materials for organics composting

The Minnesota Composting Council produced the Organics Recycling Guide, which details the accepted, not accepted, and maybe accepted materials for different types of organics programs. Table 15 details the commonly accepted materials for organics recycling for composting meaning materials that are collected and brought to a large-scale / industrial compost facility/site, industrial composting facility/site, or commercial composting facility/site. The materials are broken into four categories: food scraps, paper, other compostable/household food related items, yard waste.

Table 15: Minnesota Composting Council Organics Recycling Guide[21]

Accepted	Not Accepted	Maybe (depends on program/facility)
Food Scraps *incidental amounts are accepted		
• Fruits and vegetables – peels, pits, shells and rinds • Meat, fish, shellfish and bones – bones, scales and shells • Dairy products – yogurt, cheese, butter • Eggs and eggshells • Bakery and dry goods – pasta, grains, beans and rice, bread and cereal, nuts and shells, dough, pastries and pies • Pet food	• Grease or oil* • Chewing gum • Stickers on produce • Liquids*	n/a

[20] See https://wlssd.com/services/food-waste/for-businesses/

[21] See http://www.mncompostingcouncil.org/uploads/1/5/6/0/15602762/organics_recycling_outreach_guide_-_7.19.22.pdf

Paper *must have BPI on the product or product container ** some composters will accept these items but prefer they are not promoted on educational materials to the general public due to potential contaminants that come with them and because they cannot obtain BPI certification at this time		
• Napkins, and food-soiled paper towels • Paper egg cartons (remove sticker labels) • BPI certified plates, bowls and containers* – cups, plates and bowls*, containers* • Paper bags (recycle if not soiled) • BPI certified parchment and wax paper* • Paper bags (recycle if not soiled) • Parchment and wax paper* • Tissue paper • Paper towel and toilet paper rolls**	• Paper that can be recycled • Products labeled "biodegradable" or PLA that are not BPI certified • Cartons (milk cartons, juice boxes, soup, broth and wine cartons) • Paper products (plates, boats, cups bowls) without BPI certification • Paper products used with chemical-based cleaners • Refrigerated and frozen food boxes • Fast food wrappers (fry bags and burger/sandwich wrappers [unless BPI certified]) • Butcher paper, parchment paper, wax paper, muffin cups (unless BPI certified) • Microwave popcorn bags • Ice cream containers • Take-out food pails (unless BPI certified) • Paper coated with foil • Wax/produce cardboard boxes • Wrapping paper and tissue paper (gift wrap / packing) • Shredded paper • Receipts	• Pizza boxes from delivery** • Toilet paper (used as a tissue), Paper towels and tissues from bathrooms** • Facial tissues**
Other Compostable/Household Food Related Items *must have BPI logo on product or product container ** some programs accept commingled organics and yard waste. Be sure to check with the composting facility your material goes to verify if they accept commingled materials		
• Coffee grounds and filters • Tea • Tea bags (no synthetic filter or metal) • Houseplant trimmings	• Recyclable materials (glass, plastic, paper, metal) • Cleaning and personal care wipes • Petwaste or litter	• Yard waste** • Cotton balls and paper swabs • Animal bedding

• Wooden items such as wood chopsticks, popsicle sticks and toothpicks • BPI certified compostable products*: cups, plates and bowls*, utensils and straws*, bags*, containers*, bamboo products*, bagasse products* • Single-use coffee pods*	• Diapers • Menstrual and incontinence products • Non-BPI certified plastic (bags, containers) • Products labeled as “biodegradable” or PLA that are not BPI certified • Dryer lint and dryer sheets • Dental floss • Medicines • Cigarettes • Fireplace or BBQ ashes • Charcoal or ashes • Lumber and sawdust • Rocks, soil and dirt • Latex products – gloves, balloons • Rubber and rubber bands • Wax (wax paper, [unless BPI certified], candle wax, car wax, waxed bones) • Tape of any kind • Vacuum cleaner bags and contents • Floor sweepings • Black Walnut Shells • Pull tabs from restaurants / bars	• Hair and nail clippings (undyed and not painted) • Nutritional supplement powders (no vitamins, minerals or pill form)
Yard Waste		
• Acorns • Branches • Brush • Garden plants • Grass clippings • Hay • Leaves • Mulch (no dirt or soil) • Pine cones • Pine needles • Prunings from bushes or trees • Tree bark • Tree debris • Twigs • Wood chips (no dirt or soil)	• Dirt or soil • Pet waste • Sawdust • Sod	• Diseased plant material • Fruit from trees • Noxious weeds • Stumps • Trees • Weeds gone to seed

In addition to the Minnesota Composting Council Guidance, two county websites were reviewed for examples of how the guidance is being used. Information provided to Hennepin County residents includes a description of the compostable packaging and paper that is accepted within its organics collection program:[22]

- Certified compostable products – including paper and plastic plates, bowls, cups, containers, and utensils are accepted for organics recycling. The certified products must have the BPI logo on them or the term "certified compostable" to be accepted;
- Food soiled pizza boxes, food soiled napkins and paper towels, and paper bags soiled with food and grease are similarly accepted, along with paper egg cartons.
- Paper items that have a shiny or smooth surface, such as coffee cups, to-go containers and ice cream tubs, are likely to have a plastic lining and are not accepted for organics recycling unless they have been identified as a certified compostable item.
- Similarly takeout food pails are also not accepted, or shredded paper.

While no information as to the acceptability of compostable packaging is provided by Ramsey County itself, service operators provide some guidance; information provided to residents of Saint Paul provides a similar list to that of Hennepin County with regards to accepted materials:[23]

- Non-recyclable paper: greasy pizza boxes, paper towels, tissues, dirty paper bags and tissue paper;
- BPI certified compostable products.

A less detailed version of the same list is provided for residents of Circle Pines who use its organics collection service.

Coverage of organics drop-off collection sites

Table 16 shows the number of organics and yard waste drop-off sites by region in MN. In total there are 185 organics and 454-yard waste drop-off sites throughout the state. The TCMA has the greatest amount of organics drop-off sites and the SW region has the greatest amount of yard waste drop-off sites.

Table 16: Number of SSO and yard waste drop-off sites by region

	TCMA	NE*	NW*	NC	SE	SW	Total
Number of Drop-off Sites - organics	127	12	21	8	14	3	**185**
Number of Drop-off Sites - Yard Waste	51	22	86	53	109	133	**454**

*Data used in this table is not representative of the state population by service-type and does includes information from 84 of 87 counties, counties missing are in the NE and NW region.

In the TCMA Carver, Dakota, and Scott counties use drop-off sites to provide collection options for organics to residents. Examples of counties with organics drop-off sites in Greater MN:

- **Sherburne County (NC region)**: 5 drop-off sites

[22] See https://www.hennepin.us/en/residents/recycling-hazardous-waste/organics-recycling
[23] See https://www.stpaul.gov/sites/default/files/2023-06/%2BFood%20Scraps%20Recycling_Updated%202023_V.2.pdf

- **Pope, Douglas, and Becker Counties (NW region)**: 9 drop-off sites in Pope/Douglas, 5 drop-off sites in Becker, one drop-off site in Hubbard
- **Carlton County and WLSSD:** one drop-off site in Carlton and 15 drop-off sites throughout Duluth, Hermantown, and Proctor
- **Blue Earth and Nicollet Counties (SE region):** 3 drop-off sites in Blue Earth and 2 drop-off sites in Nicollet

Figure 5 displays the organics drop-off sites available to residents across the state from the Minnesota Composting Council. The explanation of the color coding is provided in Table 17.

Figure 5: Map of Minnesota residential organics drop-off sites[24]

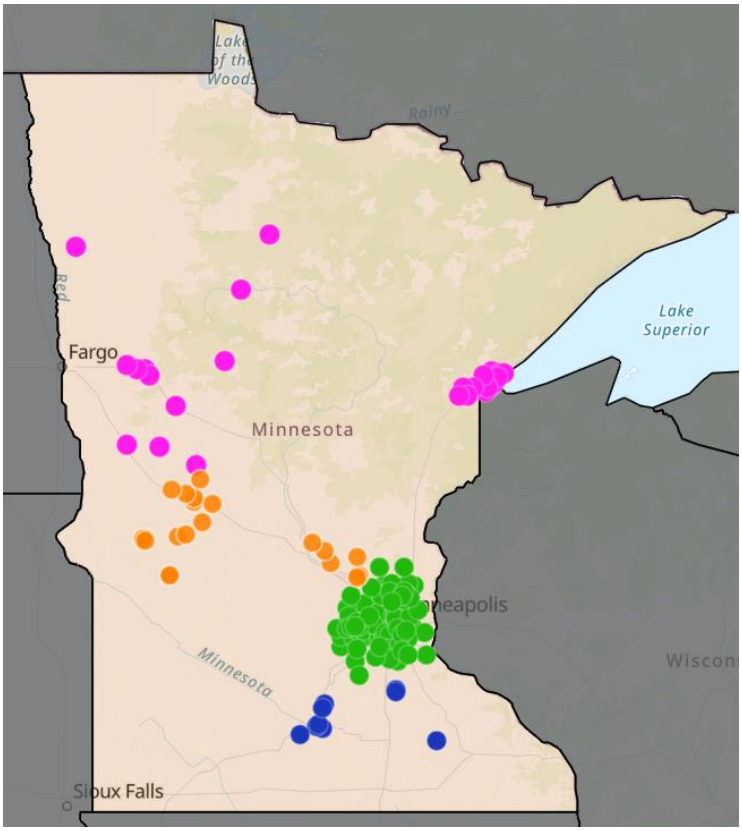


Table 17: Number of Minnesota residential organics drop-off sites[25]

Location*	Dot color in map
Central Minnesota	Orange
Metro Area	Green
Northern Minnesota	Pink
Southern Minnesota	Blue

*location groupings based on data source, these are different to the regions used in the report

[24] See http://www.mncompostingcouncil.org/residential-collection--drop-off-programs.html
[25] See http://www.mncompostingcouncil.org/residential-collection--drop-off-programs.html

Overview of infrastructure

Introduction to recycling, transfer station, and composting infrastructure in Minnesota

The recycling system outlined above is managed through recycling and composting infrastructure throughout the state including Material Recycling Facilities (MRFs), transfer stations, and organics composting facilities. Table 18 shows the number of respective facilities by region throughout the State, with a total of 17 in-state and 3 out-state MRFs, 188 transfer stations, and 9 organics composting facilities.

Table 18: Recycling, transfer station, and organics compost facility infrastructure by region

	TCMA	NE	NW	NC	SE	SW	Out-State
MRFs	6	3	4	1	1	2	3
Transfer Station Solid Waste & Recycling	49	36	34	28	26	15	
Composting -SSO	4	1	1	2	0	1	

Material Recovery Facilities (MRFs)

Figure 6 below provides the location of the MRFs in regions throughout MN. While all regions contain at least one MRF there are still some parts of the state where the distance to a MRF is significant. For example, counties in the far northwest or far southwest corners of the state, as well as a county like Itasca where the nearest recycling is over 100 miles away. There are three out-of-state MRFs shown on the map that are utilized for processing MN materials because they are closer in proximity than an MN MRF. There are four MRFs in the TCMA that, as we can see from Table 19, are managing most of the material processed in the state.

Figure 6 was compiled from data collected through annual facility reports submitted to the MPCA. This figure shows the distribution of MRFs by region. The MRFs shown range in size, complexity and capacity from a simple conveyor with manual sortation to state-of-the-art facilities with optical sorters and AI driven robotic sortation. Capacities range from several tons per day (TPD) to nearly 650 TPD.

Several MRFs outside of MN are also shown on Figure 6 including Millennium Recycling in South Dakota where material from counties in the SW may be delivered, Harters in Wisconsin, where material from counties in the SE, and MinnKota in North Dakota where waste may be delivered from some NW region counties.

Figure 6 - MRFs in Minnesota & Surrounding States

This assessment is required to include the processing capacity at recycling facilities, including total tons processed and sold and the composition of tons processed and sold at recycling facilities. However, data reported by facilities in their annual reports to the MPCA used to inform this assessment may not accurately reflect the true processing capacity of a facility. The data reported is the actual tons processed by each facility annually and not specifically the processing capacity of the facility. The data on processing capacity will need to be obtained through survey, interviews and/or site visits. The processing capacity in tons per hour (TPH) depends on many factors including but not limited to season (material density impacts), specific material composition, moisture content, and other variables. Facility reporting to the MPCA does not account for equipment used, which can have a significant impact on throughput of material. For example, equipment for processing recyclable materials can be operated at different speeds to process more or less material which will impact the sortation effectiveness and ultimately the quality and specification of the materials being captured. A processing facility can increase the processing speed of the equipment to clear the tipping floor or to accommodate a maintenance shift but, in turn, may reduce the quality of the material recovered.

The processing capacity will be requested in TPH as part of the Needs Assessment, to avoid uncertainties around operating hours as that impacts annual processing capacity (TPY). The data listed as “recycling facilities” that was provided by MPCA shows some MRFs as “permit by rule” facilities and do not specifically have a “permitted” capacity. Processing capacity will provide valuable information beyond the reported number of tons processed in previous years. Another item that impacts processing capacity and commodities recovered is related to facility improvements through operational improvement or equipment updates. For example, Polk County is currently installing robotic sorters to recover additional materials which will not be captured in the data provided by the MPCA. WM’s Twin Cities MRF and Eureka Recycling’s MRF both have had upgrades in recent years. Additional information on facilities that capture and market recyclable commodities from mixed waste through Mixed Waste Processing (MWP) or Refuse Derived Fuel (RDF) production will be included in the Needs Assessment. These facilities have “processing capacity” that are not based on tons of single stream recyclables received but rather MSW received but may also operate a separate shift dedicated to single stream recyclables in addition to a shift or shifts for processing MSW.

MRF materials processed by commodity

As stated above there are a total of 17 MRFs in the state, with at least one in each of the 6 defined regions. The capabilities at each facility vary and will be covered more completely during the Needs Assessment through surveys, site visits, or interviews. Table 19 shows the composition of the tons processed as reported by MRFs to the MPCA through annual facility reporting.

Table 19: Composition of Tons Processed by Region (tons per year)

	TCMA	NE	NW	NC	SE	SW
Corrugated cardboard and boxboard	20,6147	4,629	6,457	0	581	0
Newspaper & magazines	26,176	10	414	0	0	0
Mixed Paper	123,951	2,840	1,161	0	243	0
Other Paper	43	81	132	0	63	0
Gable-top and aseptic carton	340	0	0	0	0	0
Plastic PET #1 Bottles	24,257	407	655	0	0	0
Plastic PET #1 Non-Bottles	0	0	0	0	0	0
Plastic HDPE #2 Bottles	5,992	334	488	0	0	0
Plastic HDPE #2 Non-Bottles	0	0	0	0	0	0
Plastic PP#5	2,289	0	59	0	0	0
Plastic PS#	0	0	0	0	0	0
Plastic Mixed Plastics Rigid #3-#7	5,619	0	253	0	175	0
Plastic Film and flexible	1	0	384	0	0	0
Glass Bottles and Jars	0	0	0	0	0	0
Glass Non-container	76,821	1,484	4,509	0	296	0
Aluminum Cans	8,490	378	463	0	17	0
Aluminum Other	2,223	16	86	0	2	0
Steel Cans	11,719	1,660	2,277	4,868	22	0
Steel Other	1,900	57	40,414	0	0	0
Commingled/single/dual stream	0	0	1,099	0	0	0
Other (Recyclables)	0	0	1,659	0	0	0
TOTALS	**495,968**	**11,896**	**60,510**	**4,868**	**1,399**	**0**
	86%	**2%**	**11%**	**.8%**	**.2%**	**0**

Table 19 shows that the majority, at 86%, of material is being processed in the TCMA region, with the NW region being a distant second with only about 11% of the total tons processed/sold annually. The SW region has two MRFs identified as permitted facilities, but they are not reporting any recyclable materials processed at their facility to the state. The only material provided in facility reporting data for the SW region was MSW. Further data from these facilities, and other MRFs, on materials managed as well as capacity will be gathered for the Needs Assessment. Data from facility operators will be collected via surveys, site visits, and interviews.

MRF equipment and technologies

Capacity, or “throughput capacity” is a key metric for understanding the overall capacity of MRFs. Throughput capacity is the maximum amount of material that a facility or system can process over a specific period, usually measured per day or year. This allows a long-term view on MRF operation as daily operations vary as described above.

There is a wide range of equipment used at recycling facilities throughout the state. Facilities with throughput capacities below ~7,500 TPY will typically have limited equipment and may include conveyors, magnets, eddy current separation, and manual sortation. Facilities with more throughput capacity will typically include some or all of the following sorting equipment.

- **Manual presort:** Typically an area at the beginning of a MRF where a person or people physically remove contaminants or larger materials (may or may not be recyclable) that may damage downstream equipment;
- **Conveyors:** Device used to transfer materials from one area of the MRF to another or between pieces of equipment;
- **Liberation device** (bag opener, shredder, metering drum/wheel/bunker, etc.): Equipment used to open bagged materials to allow for sortation of the bagged contents;
- **Screens:** Screening equipment is a common type of equipment in MRFs that separate materials based on size and shape (2-dimensional vs 3 dimensional). Some examples include star screens, debris roll screens, glass breaker screens, disc screens which are typically used to separate materials based by size and are typically a series of shafts, connected at both ends, spaced based on the size of material, that rotate to agitate materials to allow smaller material to fall between the rotating shafts and larger materials to pass over the top to the next piece of equipment . Auger screens also separate materials by size and have rotating shafts that are only connected at one end to minimize wrapping of long stringy materials. Inclined screens are similar to screens used for size separation but are inclined and separate containers (3 dimensional) from flat (2 dimensional) materials and the small heavier fraction like broken glass, grit, stones fall through the screen.
- **Ballistic separation:** Ballistic separators rotate in an elliptical motion to move lighter 2-dimensional materials like paper run over the screen, heavier 3-dimensional materials like containers bounce backwards from the screen, and small materials like broken glass fall through holes that remove them from the stream. The 3 fractions from a ballistic separator are typically collected on three different conveyors for additional separation (3 dimensional containers), quality control (2 dimensional) and glass or residue.
- **Trommel:** A trommel is an inclined rotating drum or tube that agitates material as it travels from one end to another. The drum or tube has various sizes of holes around the outside perimeter of the drum that allows materials of various sizes to pass through the holes and larger material to exit at the end of the trommel. Typically, there are 3 different size fractions separated by a trommel. Trommels may have sharp protrusion as the start of the trommel to open bags.
- **Magnets**: Equipment used to recovery ferrous metals and transfer them to a separate conveyor;
- **Eddy current separator:** A type of sorting equipment that uses magnetic rotors to create a force called an eddy current that separates non-ferrous metals such as aluminum, die-cast metal, and copper, from non-metallic materials like paper or plastic.
- **Optical sorting:** Optical sorting systems are a technology that includes advanced cameras, or near infrared and sensors to identify recoverable materials and use jets of air to move and sort materials into categories.
- **Robotics employing AI:** Equipment using cameras to identify materials and “learn” using AI to improve the ability to identify the material a robotic arm is intended to pick. The camera tells the robot arm the specific location of the targeted material;
- **Air knives/air separation:** Equipment used for density separation to separate heavy materials (glass, grit, rocks) from lighter materials (paper, plastics); and

- **Balers**: Equipment used to densify recovered materials that have been separated in the MRF into a single commodity. Balers allow MRFs to densify commodities to allow for more cost-effective shipment of materials.
- **Recycling shredders:** Shredding machines cut materials into smaller, more uniform pieces for further processing. Shredding also reduces material volumes which makes it easier to manage and transport. Shredding machinery can be used on a wide variety of materials, including metal, plastic, paper, wood, and electronics.

Based on the data on the composition of tons processed, nearly 97% is processed in the TCMA and NW regions. Therefore, it is not surprise that these two regions have facilities with technologically advanced processing equipment. The remaining regions of the state process significantly fewer tons and have less technology and more manual sortation.

Other facilities

The solid waste and recycling infrastructure in MN is diverse and complex. For some regions the distance between facilities can be more than 100 miles, while for others it may be less than 10 miles. As explained above, equipment used and amount of material processed depends on the type of material being processed. MN is relatively unique in that there are 6 facilities processing MSW to recover recyclables before the waste goes to a waste-to-energy facility for electrical generation or electrical generation and steam heat. These facilities that pre-process MSW to recover recyclables, include Polk County, Perham, and Pope/Douglas in the NW region, City of Red Wing and Minnesota Waste Processing in the SE region and Recycling & Energy in the TCMA region.

Transfer stations

Table 18 above indicates that there are 188 transfer station facilities. to Figure 7 to Figure 12 show the distribution of transfer stations throughout the six regions of the state.

Figure 7 - TCMA Region Transfer Stations

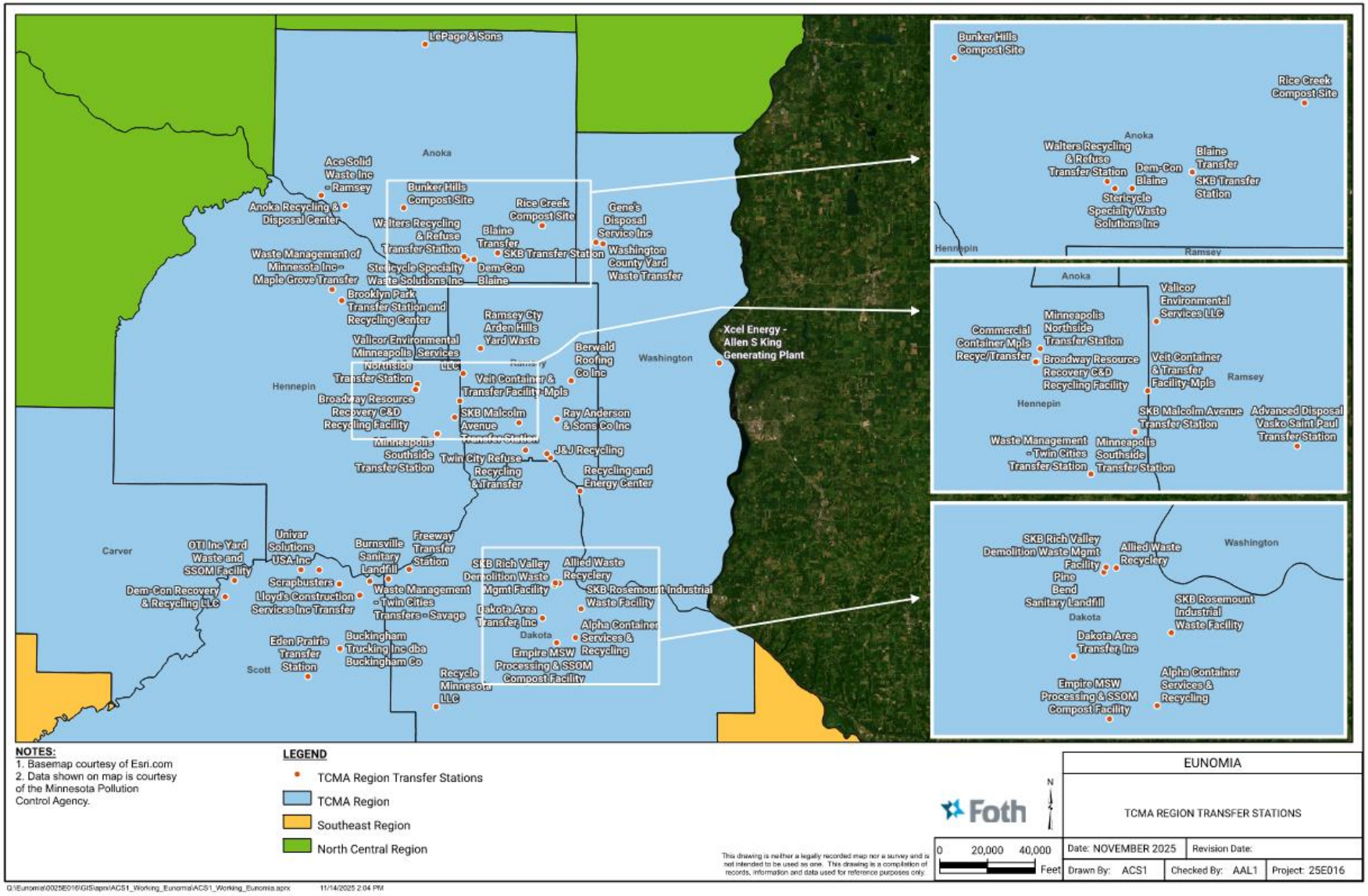


Figure 8 - Northeast Region Transfer Stations

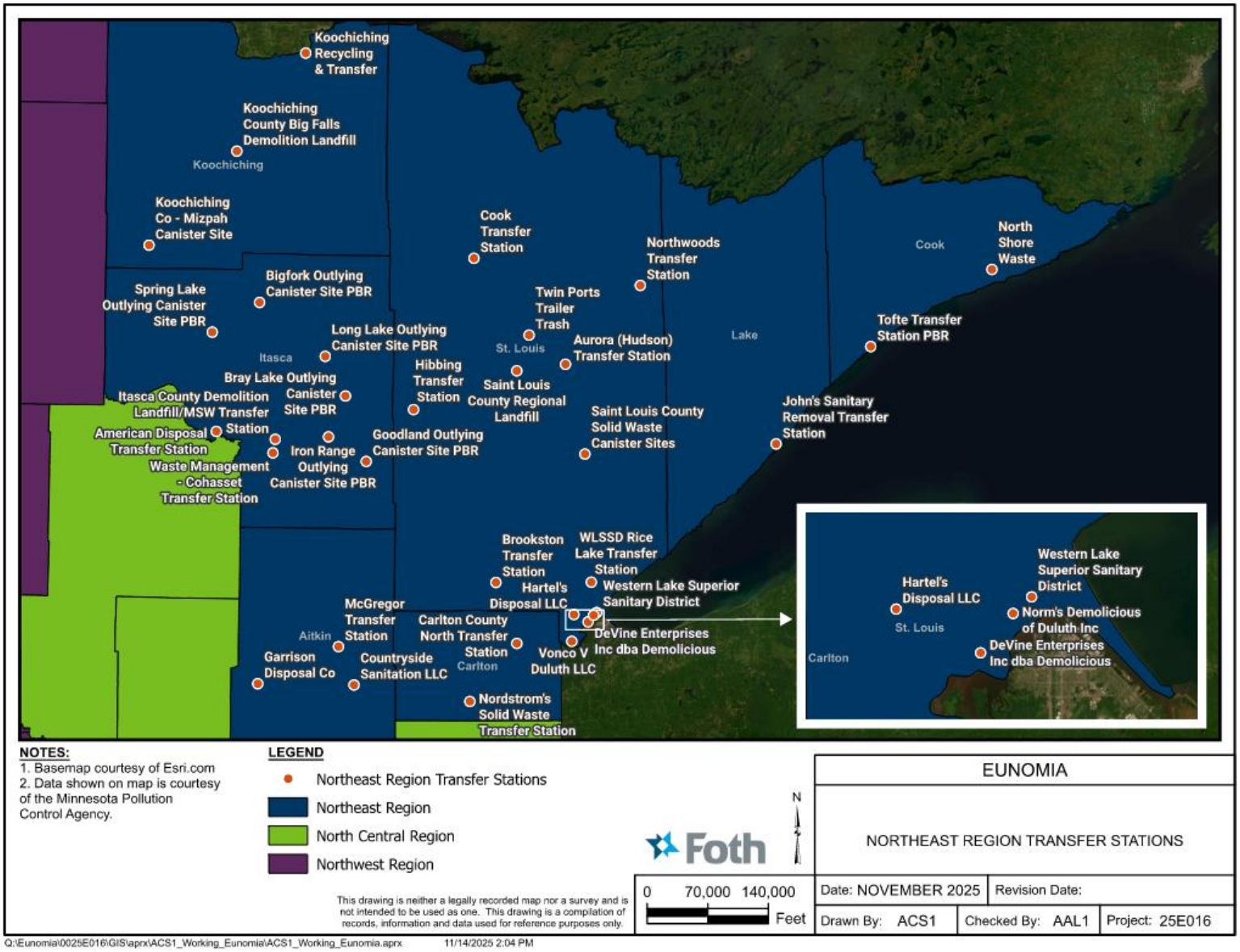


Figure 9 - Northwest Region Transfer Stations

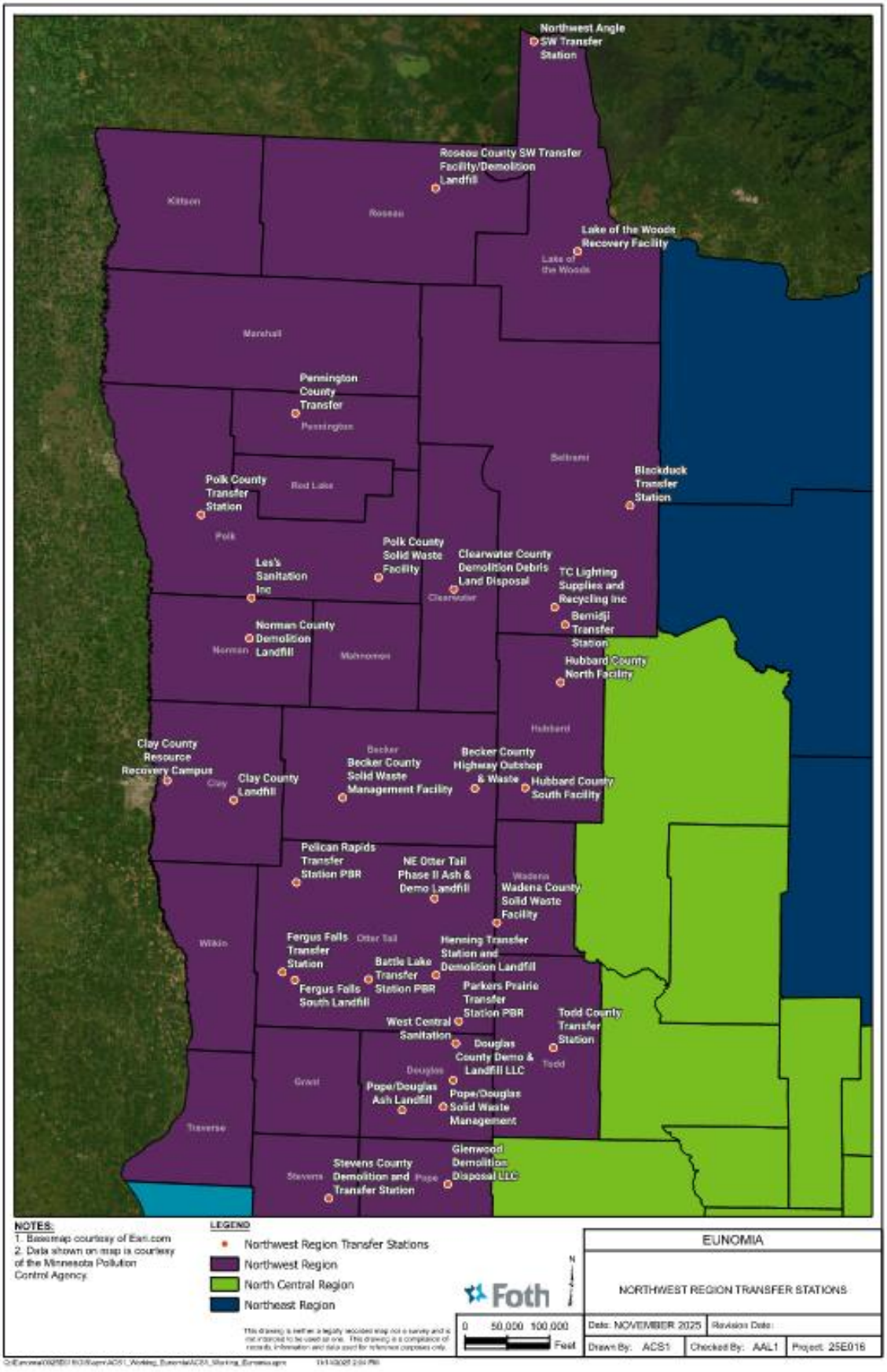


Figure 10 - North Central Region Transfer Stations

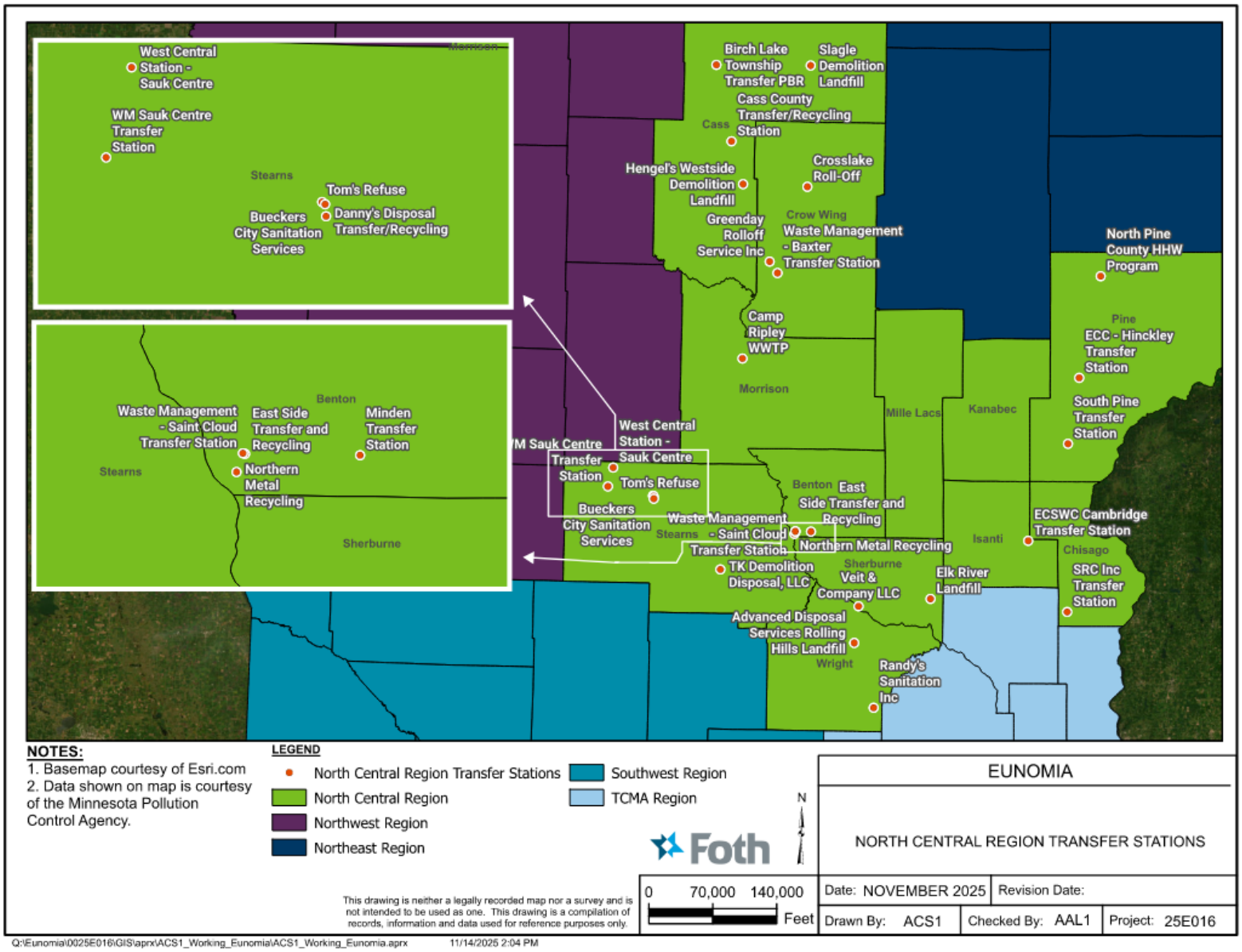


Figure 11 - Southeast Region Transfer Stations

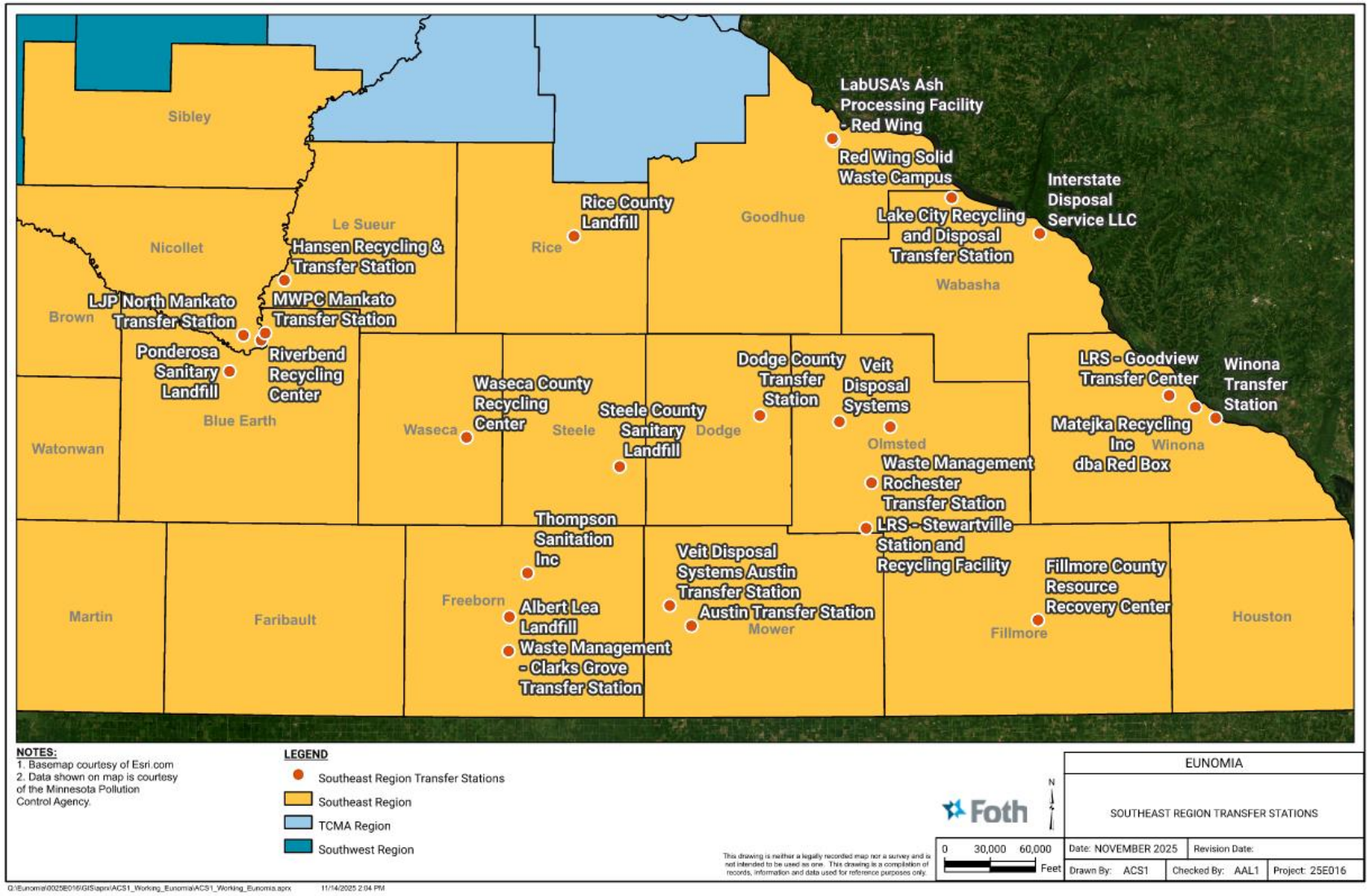
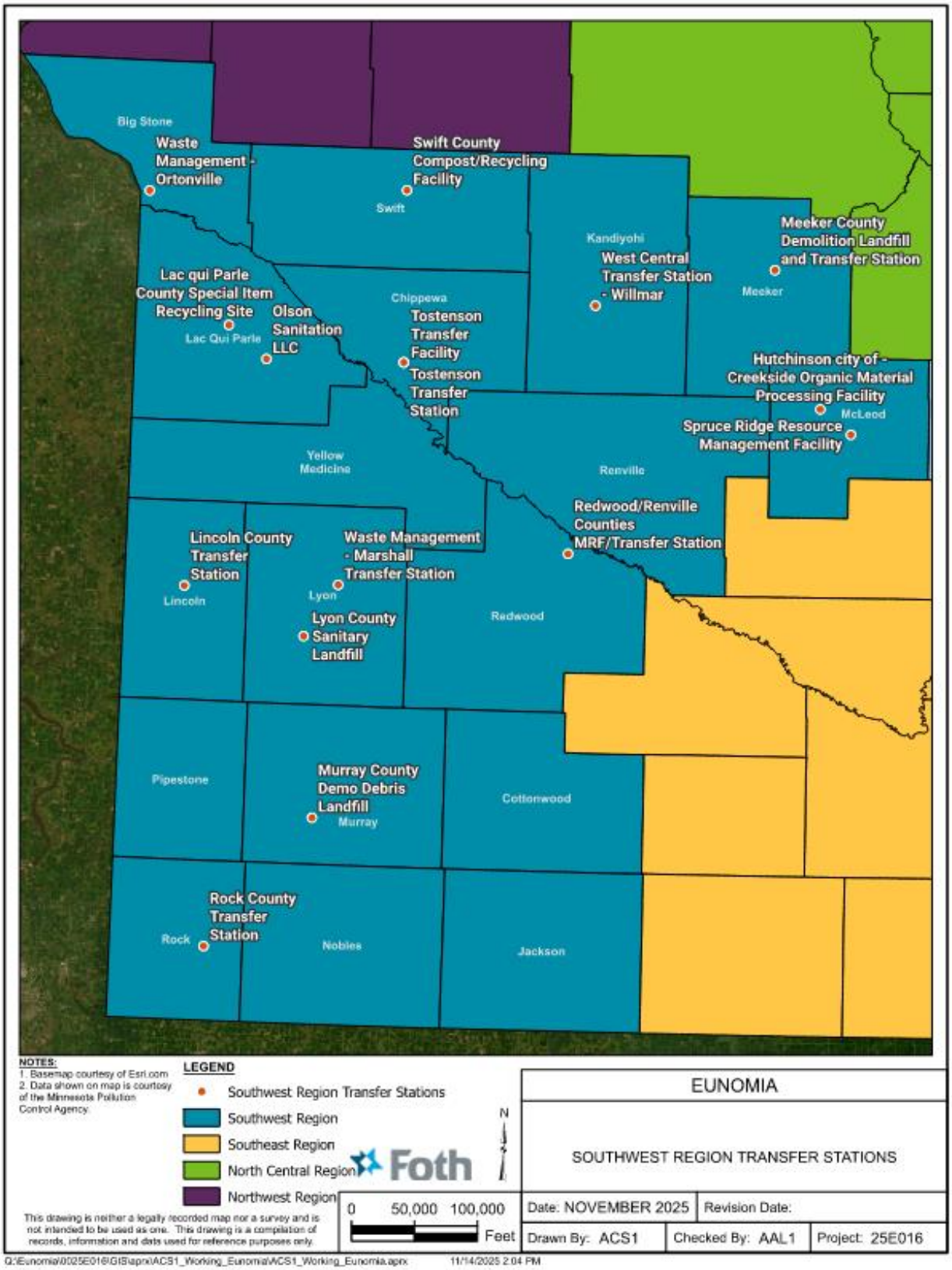


Figure 12 - Southwest Region Transfer Stations



Transfer station capacity data is submitted annually by facilities to the MPCA. The sum of facility permit capacities by region and split by "solid waste & recycling" facilities and solid waste only facilities is shown in Table 20 below.

Table 20: Transfer station permitted capacity by region

	TCMA	NE	NW	NC	SE	SW
Number of **Solid Waste & Recycling** Facilities that reported capacity data	2	1	4	1	2	1
Solid Waste & Recycling Facility Permitted Capacity (Tons per Year)	363,503	9000	83,700	35,000	120,000	6500
Number of **Solid Waste Only** Facilities that reported capacity data	43	33	26	24	22	13
Solid Waste Only Facility Permitted Capacity (Tons per Year)	4,162,006	574,544	386,154	72,4041	1,025,792	225,831

Composting facilities

For this Preliminary Assessment, the focus was on composting facilities permitted to accept organics or SSO which are shown in Figure 13.

Figure 13 - SSO Composting Facilities

Table 21 shows the 9 organics facilities that accept SSO and their locations around the regions of the state. The composting facilities in the TCMA region are permitted to manage over 68% of the overall state's capacity. The data for Table 21 below was taken from the Facility Capacity Data gathered by the MPCA.

Table 21: Composition of SSO tons processed by region

	TCMA	NE	NW	NC	SE	SW
SSO Facilities in Region	4	1	1	2	0	1
Permitted Capacity (tons/yr)	204,000	16,000	7,800	80,0151	0	4,400

Technologies used at compost facilities can include debaggers, shredders, windrow turners, frontend loaders, aeration, static pile, aerated static pile, and covered aerated static pile. There are three main styles by which these facilities are designed:

- **Aerated Static Pile:** A composting method in which organic materials are piled and aerated using a system of perforated pipes or blowers, without the need for turning. Covered or uncovered.
- **Static pile composting:** A composting method where organic materials are piled and aerated without turning, often using perforated pipes or blowers.
- **Windrow composting:** A long, narrow pile of organic materials arranged for composting, typically turned periodically to maintain aerobic conditions.

Larger facilities in the TCMA region have begun adding technologies such as debaggers and shredders to their process to be able to manage large amounts of food waste coming into their facility with packaging. Majority of the facilities use front end loaders and wind row turners to process smaller amounts of SSO, and are selective about inputs to combat contamination issues. Actual processing data and equipment data will be collected from facilities through surveys, site visits and interviews during the Needs Assessment. A common technology used to remove contamination are **drum separators**, which use a combination of high-speed conveyors, fans, and a rotating drum to separate materials based on weight and density.

Contractual arrangements

Information on contract structures for recycling services was available for cities in Ramsey County which sits in the TCMA. Contract lengths here vary between one year and seven years between cities with the majority being 5-year contracts.

For Greater MN, SWMP review revealed two counties with organized recycling collection:

- **Steel County:** has a 5-year contract with recycling hauler Thompson Sanitation Inc. from November 2023 to October 2028; and
- **Big Stone County:** has a 5-year contract with Waste Management.

Data on the set annual cost increases for these contracts was available for 3 cities within Ramsey County and were as follows:

- the lower of 5% or the consumer price index (CPI), capped at 5%;
- the higher of 5% or the CPI, capped at 8%; and
- 3%.

All cities in Ramsey County where contract details were available bill monthly for their recycling services and prices range from $4.49 per month to $7.99 per month for single family units and from $2.50 per month to $7.61 per month for multi-family units.

Cost structures for typical recycling collection contracts allow haulers increase or decrease their rates based on the annual CPI.

Some contracts establish revenue sharing, where the city can receive revenue from the sale of the recyclable materials. This is a feature in about one in five of the cities in Hennepin County.

Covered materials introduced by producers and collected for recycling

Introduced by producers

Currently, MN-specific data on covered materials introduced by producers is not available. This information will become available once a plan is approved and fee collection and reporting begins. In the absence of this data, the total tonnage of covered materials introduced by producers in 2024 was estimated using data from other jurisdictions. The project team also requested input from CAA Minnesota, the PRO for MN's EPR program, to help best estimate covered materials introduced by producers in the absence of MN-specific supply data. The project team assessed these inputs with MN data to generate estimates of covered materials introduced by producers in MN.

Table 22 provides an estimated range of tons per capita of covered materials that was used to estimate tons supplied by producers in MN. These estimates have been informed by multiple data sources described below.

Canadian jurisdictions – producer reported tonnages

The Canadian jurisdictions referenced include British Columbia, Manitoba, Saskatchewan, and Ontario, which have mature EPR for packaging and paper programs with publicly available annual reports detailing producer-reported tonnages by material category (e.g., paper, flexible plastic, rigid plastic, metal, glass). The data from these jurisdictions cannot be used directly to estimate the potential amount of covered material introduced by producers in MN for the following reasons:

- The covered entities are not the same (e.g., some jurisdictions include paper and packaging generated by government entities and the de minimis levels vary – tons supplied into the jurisdiction and gross revenue)
- The covered materials are not the same (e.g., no Canadian jurisdiction includes reusable/refillable packaging; all exempt packaging materials that are covered in other policies such as beverage deposit return or EPR for household hazardous and special products)
- Consumption levels are different as are other factors such as average household expenditures, household income, and gross domestic product
- There is limited data on compostable packaging and paper

The data from these jurisdictions was adjusted to account for the differences noted above to produce an estimated range for MN.

Preliminary producer ranges incorporating US states with packaging EPR producer reported tonnages

CAA provided aggregated high and low ranges of pounds per capita based on a combination of Canadian and US jurisdictions, including British Columbia, Manitoba, Ontario, Saskatchewan, Oregon, Colorado, and a modeled estimate for California.

Databases on packaging sold in the US

The project team also used packaging-specific datasets and past reports to validate the producer reported tonnages and bolster these estimates. The following sources were used:

- GlobalData: this dataset is not EPR-specific but provides national-level estimates of packaging placed on the market across material categories.[26]
- "How Circular is Glass?" Report: Eunomia's previous report on glass production in four countries includes an analysis of glass packaging sold in the US.[27]
- "How to Scale the Recycling of Flexible Film Packaging" Report: Eunomia's previous report on flexible film packaging includes an analysis of flexible plastic sold in the US.[28]

Table 22: Estimated covered materials introduced by producers annually

Material Category	Low (lbs/capita)	High (lbs/capita)	Proportion of covered materials	Total Tons
Paper	91	124	44% – 54%	265,829 - 362,228
Rigid Plastic	22	42	13% - 15%	63,824 - 122,690
Flexible Plastic	9	40	5% - 14%	25,534 - 115,695
Metal	14	19	7% - 8%	40,897 - 55,503
Glass	31	52	17% - 19%	90,557 - 152,614
Compostable	1	7	1% - 2%	3,035 - 20,448
Total	**168**	**284**	**100%**	**489,676 - 829,178**

Across the jurisdictions reviewed, EPR for packaging and paper programs vary in scope and obligations, which affects how tonnage data can be interpreted for MN. Canadian programs such as British Columbia, Ontario, Manitoba, and Saskatchewan generally cover both packaging and printed paper, while MN's planned program exempts some printed paper. Oregon's program does not include alcoholic beverages because they are covered under Oregon's Bottle Bill, whereas MN does. These differences in covered materials and entities were considered when applying data from these jurisdictions to MN to avoid over- or under-estimating tonnages to the extent possible with the available data.

These per capita estimates were then applied to MN state population to obtain a total estimate for the amount of covered materials introduced by producers shown in Table 22. Due to the key differences in economic markets and EPR programs, the total tons are presented as ranges.

The Packaging Waste and Cost Reduction Act requires that measurement moves beyond a single measure. Recycling and composting rates are predominantly measured by weight. To begin to round out measurement outcomes are required to consider where unit-based and volume-based measurement adds value. This assessment is required to include the volume of materials introduced.

[26] See https://www.globaldata.com/product/packaging-primary-packaging-outers-volume-database/
[27] See https://eunomia.eco/reports/how-circular-is-glass/
[28] See https://plasticsrecycling.org/wp-content/uploads/2024/08/Pyrolysis-Role-in-_FFP-Recycling-Report.pdf

Material volumes were calculated using the composition of recyclables, and using volume conversions of recyclables as shown in Table 23 using EPA's Volume-to-Weight Conversions Factors.[29]

Table 23: Estimated covered materials introduced by producers annually, by volume

Material Category	Volume converter (Lbs per cubic yard)	Low estimate converted from weight to cubic yards	High estimate from weigh to cubic yards
Paper	312	1,706,373	2,325,164
Rigid Plastic	29	4,456,372	8,566,563
Flexible Plastic	35	1,459,086	6,611,143
Metal	87	944,830	1,282,268
Glass	380	476,616	803,232
Compostable	35	173,429	1,168,457
Total	-	**9,216,706**	**20,756,827**

Collected for recycling

Data on the tons of collected covered materials is presented in Table 24, Table 25, and Table 27 which show respectively the materials collected for recycling by residential single-family households, multi-family households, and schools. In understanding these tables, it is important to note the coverage of the waste collection service to each type of waste generator:

- Property types covered by the residential service are typically single-family dwellings to four-plex dwellings, as such the service does not cover all households;
- Residential multi-family units are reported as commercial waste. These tonnages were therefore estimated according to the ratio of recycling that is collected from multi-family versus single-family units. This ratio was estimated according to Eunomia's previous work on EPR targets in the State of Washington, which was based on reported tonnages from single-family and multi-family waste generators;[30] and
- Schools include all public and private schools and waste is reported under commercial waste. To estimate the tons of covered materials collected for recycling, the lbs/student of recycled materials from Colorado were used and multiplied by the total number of students in MN. The proportion of waste that was paper, plastic, metal or glass was determined using a 2010 waste composition of school waste.[31]

Multi-family waste collected quantities are much higher in the TCMA region – which has a high concentration of larger apartment blocks.

[29] See https://www.epa.gov/sites/default/files/2016-04/documents/volume_to_weight_conversion_factors_memorandum_04192016_508fnl.pdf
[30] See https://apps.ecology.wa.gov/publications/documents/2307060.pdf
[31] See https://www.pca.state.mn.us/sites/default/files/p-p2s6-14.pdf

Table 24: Total tons of covered material collected for recycling in 2024 by region - residential (households with 4 or less units)

Material Type	Material Category	TCMA	NE	NW	NC	SE	SW	Total
Paper	Cardboard (OCC and boxboard)	38,932	7,504	6,753	10,818	13,292	8,193	**85,492**
	Newspaper and Print	61,888	3,468	2,747	8,671	7,138	4,619	**88,531**
	Other Paper	58,037	4,420	2,700	8,146	11,943	5,865	**91,111**
	Cartons	216	0	5	8	234	10	**473**
	Total Paper	**159,073**	**15,392**	**12,204**	**27,643**	**32,608**	**18,687**	**265,608**
Plastic	#1 PET	4,050	335	651	740	1,606	467	**7,849**
	#2 HDPE	1,842	196	761	483	1,365	483	**5,131**
	Other Mixed Rigid Plastics #3 – #7	8,685	927	662	1,706	1,677	1,140	**14,796**
	Flexible Plastics (Mixed Bags, Wraps and Film)	67	4	386	289	78	3	**828**
	Total Plastic	**14,644**	**1,462**	**2,459**	**3,218**	**4,727**	**2,093**	**28,603**
Glass	Glass Containers	42,458	4,903	4,165	8,241	8,064	3,991	**71,822**
	Non-Container Glass	0	0	0	362	813	432	**1,607**
	Total Glass	**42,458**	**4,903**	**4,165**	**8,603**	**8,877**	**4,423**	**73,429**
Metal	Aluminum Cans	2,375	427	1,043	718	755	443	**5,761**
	Aluminum	2,376	150	204	681	956	143	**4,511**
	Ferrous Metals[32]	2,901	2,237	2,805	1,783	3,709	2,635	**16,071**
	Total Metal	**7,652**	**2,814**	**4,053**	**3,182**	**5,421**	**3,220**	**26,342**
Total	Total	**223,827**	**24,572**	**22,881**	**42,647**	**51,632**	**28,424**	**393,982**

Table 25: Estimate of total tons of covered material collected for recycling in 2024 by region – multi-family households of 5 or more units

	TCMA	NE	NW	NC	SE	SW	Total
Paper	24,786	1,153	960	1,886	2,613	1,032	32,430
Plastic	2,522	107	186	266	436	112	3,629
Glass	6,635	359	366	630	763	261	9,015

[32] Ferrous metal tons were assumed to include scrap metal as well as packaging materials, as tons reported in SCORE were very high. Therefore, 63% of ferrous tons were assumed to be scrap, based on MRF composition data, and were removed from the ferrous tons reported in this Preliminary Assessment.

Metal	1,037	219	317	211	487	202	2,475
Total	**34,980**	**1,839**	**1,830**	**2,993**	**4,299**	**1,607**	**47,548**

Table 26: Estimate of total tons of covered material collected for recycling in 2024 by region – schools

	TCMA	NE	NW	NC	SE	SW	Total
Paper	5,348	200	724	1,272	1,204	490	9,239
Plastic	1,747	65	237	416	393	160	3,018
Glass	75	3	10	18	17	7	130
Metal	212	8	29	50	48	19	365
Total	**7,382**	**276**	**999**	**1,756**	**1,662**	**677**	**12,752**

In order to better compare performance between the regions, residential tons were also assessed on a lbs/household basis (Table 27). It is important to note that residential tons data used to calculate these statistics do not include material collected from larger apartment buildings. For highly urban areas, such as TCMA, collected tonnages data will more significantly underreport the actual amounts collected from householders than is the case for less densely populated districts with fewer apartment blocks. The demographics data confirms that 25% of housing units in the TCMA region are multi-family housing units with 5 units or more; the comparable proportion for the NW and NC regions is 14% and 13% respectively.

Table 27: Pounds per household of covered material collected for recycling in 2024 by region - residential (households with 4 or less units)

Material Type	Material Category	TCMA	NE	NW	NC	SE	SW	Total
Paper	Cardboard (OCC and boxboard)	83	140	95	91	105	161	96
	Newspaper and Print	133	65	39	73	57	91	100
	Other Paper	124	83	38	69	95	115	103
	Cartons	0	0	0	0	2	0	1
	Total Paper	**341**	**288**	**172**	**234**	**259**	**368**	**300**
Plastic	#1 PET	9	6	9	6	13	9	9
	#2 HDPE	4	4	11	4	11	10	6
	Other Mixed Rigid Plastics #3 – #7	19	17	9	14	13	22	17
	Flexible Plastics (Mixed Bags, Wraps and Film)	0	0	5	2	1	0	1
	Total Plastic	**31**	**27**	**35**	**27**	**37**	**41**	**32**
Glass	Glass Containers	91	92	59	70	64	79	81
	Non-Container Glass	0	0	0	3	6	9	2
	Total Glass	**91**	**92**	**59**	**73**	**70**	**87**	**83**

Metal	Aluminum Cans	5	8	15	6	6	9	7
	Aluminum	5	3	3	6	8	3	5
	Ferrous Metals	17	114	108	367	80	141	93
	Total Metal	**27**	**125**	**125**	**379**	**94**	**153**	**105**
Total	Total	**491**	**531**	**390**	**713**	**460**	**649**	**519**

It was not possible to determine the recycling rates of covered materials only within this assessment. An assessment of overall collected for recycling rate, including all recyclables and compostables collected for recycling can give an indication of how well each region is currently performing and is shown in Table 28. There is no separate data available on the amounts of compostable packaging and paper collected for composting. Table 28 indicates the TCMA region is the best performing in terms of recycling rate, while the NW and NC regions have the lowest performance.

Table 28: Overall recycling rate by region (including materials that are not covered)

		TCMA	NE	NW	NC	SE	SW	Total
Collected for Recycling* (including organics)	Residential	542,980	37,695	45,403	132,072	90,810	85,778	**934,739**
	Commercial	1,159,428	106,053	117,237	164,805	341,692	66,202	**1,955,417**
Trash (Landfill, WtE, Onsite)**	Total Trash	1,782,335	190,580	266,916	481,344	557,258	189,978	**3,468,411**
Overall Recycling Rate		49%	43%	38%	38%	44%	44%	**45%**

*Includes organics, yard waste, and materials beyond what is a covered material in the Packaging Waste and Cost Reduction Act **Waste to Energy

Indicative service costs

Recycling costs

Cost data for recycling services was limited. Only 5 of the SWMPs included costs to households, and this was usually presented as a bundled cost with trash services. For the Needs Assessment, further data will be obtained through surveys and interviews.

Data on costs relies on service provider registration and costs from organized recycling collection agreements in Hennepin County and Ramsey County. Data from these sources were used to calculate an average cost of recycling per household for urban and rural areas. Cost data included amounts for collection, transfer, and processing costs and are net of material revenue, and cover single-family and multi-family households. It was not possible to apply separate costs to single-family and multi-family, as there was little data available on multi-family costs. The costs per household were further cross-checked against known costs from other states. Calculated costs per household are shown in Table 29. A range of $4-$14 per month per household for curbside recycling services was found.

Table 29: Estimated cost of recycling service per household per month

Cost per household per month	Low	High
Curbside Recycling Service	$4.00	$14.00

The assumed costs per household were applied to the number of households within each region that has access to either a curbside recycling service or drop-off only. The low value was used for urban households, and the high value for rural households, which also accounts for the higher than average number of multi-family households in urban areas. The results of this are shown in Table 30, showing total costs of recycling services in MN to be in the region of $118 million. The TCMA region accounted for 45% of the total costs, which is expected due to the high population in this region and the high proportion of households offered curbside services. Where drop-off only services were the predominant recycling system, such as in the NE and NW regions, costs were lower.

Table 30: Estimated total recycling service costs by region for 2024 ($ million)

	TCMA	NE	NW	NC	SE	SW	Total
Residential Curbside Costs	$51.6m	$1.7m	$8.0m	$21.1m	$22.0m	$9.3m	$113.7m
Commercial Costs	No data available						
Drop Off Costs	No data available						
Total	$51.6m	$1.7m	$8.0m	$21.1m	$22.0m	$9.3m	$113.7m

We have developed estimates of the costs of recycling service per household in Table 31, taking into account the relative contribution from curbside and drop-off services. This shows an average cost per

household of $4.35 per month across the state. Areas with a high urban population (TCMA), as well as regions offering mainly drop-off services (NE and NW regions) have the lower costs per household overall. The NE region had the lowest costs as only 12% of households have a curbside collection, and drop-off costs were modelled at a lower cost per household than curbside collections. Regions that have a mix of urban and rural communities and offer curbside services to the majority of the households (NC, SE and SW) had the highest costs per household. This is due to the cost of collection from rural households being higher than that of urban households.

Table 31: Estimated recycling service costs per household by region for 2024

	TCMA	NE	NW	NC	SE	SW	MN State
Total	**$3.55**	**$1.54**	**$4.09**	**$6.34**	**$6.19**	**$6.86**	**$4.35**

Due to the data and methodology limitations, costs are indicative only. Variances in cost due to contract length, haulers, and service design were not accounted for, as well as variances across regions. Further, these costs cover single-family and multi-family households but do not cover commercial entities, where rates were variable and the number of entities covered was not known.

Further cost data will be gathered for commercial entities as part of the Needs Assessment through surveys and interviews to gain a much clearer understanding of the number of entities and the variations in costs between entities.

Organics costs

Cost data for organics services relies on service provider registration, and costs from organized recycling collection services in Hennepin County and Ramsey County. These were used to create an assumption on the cost of curbside collections of organics by household, shown in Table 32. An average cost per household of $6.30 was calculated. The cost per household was then applied to the number of households covered by the service within each region. No data was available for the cost of drop-off only organics services.

Over 80% of the total costs are for organics services delivered to the TCMA region. This is because 29% of residents have a curbside collection service in this region, compared to less than 20% in all other regions.

Table 32: Estimated total organics service costs by region for 2024 ($ million)

	TCMA	NE	NW	NC	SE	SW	Total
Residential Organics Costs	$42.0m	$0.0m	$2.6m	$2.7m	$1.5m	$1.6m	$50.4m
Commercial Costs	No data available						
Drop Off Costs	No data available						
Total	**$42.0m**	**$0.0m**	**$2.6m**	**$2.7m**	**$1.5m**	**$1.6m**	**$50.4m**

Data for the cost of organics services for covered entities that receives service as commercial waste generators was not available.

End markets for covered materials

End markets are essential to the functioning of recycling and organics programs as they are an outlet for diverted materials from the waste stream. They convert the materials into commodities and supply them to manufacturers for the production of new products. The US EPA defines potential primary end markets *'as industries that can potentially use recycled material directly in production';* it further defines recycling facilities as being those that produce secondary raw materials from the recovered recyclables.[33]

The Packaging Waste and Cost Reduction Act defines a responsible market as a materials market that:

- reuses, recycles, composts, or otherwise recovers materials and disposes of contaminants in a manner that protects the environment and minimizes risks to public health and worker health and safety;
- complies with all applicable federal, state, and local statutes, rules, ordinances, and other laws governing environmental, health, safety, and financial responsibility;
- possesses all requisite licenses and permits required by a federal or state agency or political subdivision;
- if the market operates in the state, manages waste according to the waste management goal and priority order of waste management practices stated in the statute; and
- minimizes adverse impacts to environmental justice areas, as defined in the statute.

The MPCA maintains a recycling markets directory which shows the available markets for recycling by material type throughout the state. This directory lists a variety of entity types such as those that process scrap material, those that recycle material into secondary raw materials such as glass cullet or plastics resins, and those that use secondary raw materials to produce new products such as glass container manufacturers. Table 33 shows the number of recycling markets in MN by material type according to the MPCA's recycling markets directory, which was last updated in 2023.

Table 33: Available recycling markets in Minnesota by material type according to the MPCA recycling market directory[34]

	Plastic	Glass	Metals	Paper/Fiber
Number of Available Markets in State	13	2	26	9

The US EPA also maintains a recycling infrastructure and markets opportunity map which shows recycling facilities and potential primary recycling end markets throughout the US. The map was developed from 2021-2022 to assist in efforts to meet the National Recycling Goal of increasing the US

[33] US EPA (2021-2022) *Recycling Map* [Interactive map]. ArcGIS Experience. https://experience.arcgis.com/experience/6aaa6b2293eb41c4a77845e6304f176a/page/Recycling-Map (accessed November 6, 2025)
[34] Minnesota Pollution Control Agency. (n.d.). *Recycling markets*. Minnesota Pollution Control Agency. https://webapp.pca.state.mn.us/recycling-markets/search (Accessed November 6, 2025)

recycling rate to 50% by 2030[35]. Table 34 shows the number of recycling facilities and potential primary end markets in MN by material type according to the US EPA's Recycling Infrastructure map. The number of potential primary end markets for each material category is significantly higher than the number of recycling facilities, as typically there are facilities that produce secondary raw materials - and many of the facilities listed as potential primary end markets are scrap processors and manufacturers that use secondary raw materials to manufacture new products.

Table 34: Number of recycling facilities and potential primary end markets in Minnesota according to the us EPA's recycling infrastructure and markets opportunity map[36]

	Plastic	Paper/Fiber	Glass	Metals
Number of Potential Primary End Markets	85	75	44	151
Number of Recycling Facilities	3	2	1	0

Details on the individual facilities include the following:

- The glass facility identified by the US EPA as a recycling facility is Sibelco's (formerly Strategic Material Inc) glass beneficiation plant in St. Paul, MN, which produces glass cullet from recovered glass.[37]
- The paper and fiber facilities identified include that run by Liberty Paper Incorporated in New Hope MN, a paper mill transforming OCC into high-quality paper, which is then layered to produce a variety of customized corrugated products.[38]
- A second paper mill is run by Sofidel America in Duluth, MN; this mill has a production capacity of 65,000 metric tons per year.[39]
- The plastic facilities are Choice Plastics in Mound MN, Discover Plastics in Rogers, MN and Gopher Resource in Eagan MN.

Data is not publicly available on the capacity of markets and will be collected as part of the Needs Assessment. In addition to understanding the locations and capacity of available markets for materials the Needs Assessment will also require a review of markets meeting the definition of responsible market.

[35] US EPA (2021-2022) *Recycling Map* [Interactive map]. ArcGIS Experience. https://experience.arcgis.com/experience/6aaa6b2293eb41c4a77845e6304f176a/page/Recycling-Map (accessed November 6, 2025)
[36] US EPA (2021-2022) *Recycling Map* [Interactive map]. ArcGIS Experience. https://experience.arcgis.com/experience/6aaa6b2293eb41c4a77845e6304f176a/page/Recycling-Map
[37] Sibelco. (n.d.). *St Paul* [Web page]. https://www.sibelco.com/en/sites/st-paul (Accessed November 6, 2025)
[38] Liberty Packaging Inc. (n.d.). *Paper mill*. https://www.libertypackaginginc.com/paper-mill/ (Accessed November 6, 2025)
[39] Sofidel. (n.d.). *Sofidel America*. https://www.sofidel.com/en/the-group/sofidel-in-the-world/sofidel-america/ (Accessed November 6, 2025)

Appendix – A

Region for Packaging Waste and Cost Reduction Act	County
Twin Cities Metro Area (TCMA)	Anoka
	Carver
	Dakota
	Hennepin
	Ramsey
	Scott
	Washington
North Central (NC)	Benton
	Cass
	Chisago
	Crow Wing
	Isanti
	Kanabec
	Mille Lacs
	Morrison
	Pine
	Sherburne
	Stearns
	Wright
Northeast (NE)	Aitkin
	Carlton
	Cook
	Itasca
	Koochiching
	Lake
	St. Louis
Northwest (NW)	Becker
	Beltrami
	Clay

	Clearwater
	Douglas
	Grant
	Hubbard
	Kittson
	Lake Of The Woods
	Mahnomen
	Norman
	Otter Tail
	Pennington
	Pennington
	Polk
	Pope
	Red Lake
	Roseau
	Stevens
	Todd
	Traverse
	Wadena
	Wilkin
Southeast (SE)	Blue Earth
	Brown
	Dodge
	Faribault
	Fillmore
	Freeborn
	Goodhue
	Houston
	Le Sueur
	Martin
	Mower
	Nicollet
	Olmsted
	Rice

	Sibley
	Steele
	Wabasha
	Waseca
	Watonwan
	Winona
Southwest (SW)	Big Stone
	Chippewa
	Cottonwood
	Jackson
	Kandiyohi
	Lac Qui Parle
	Lincoln
	Lyon
	McLeod
	Meeker
	Murray
	Nobles
	Pipestone
	Redwood
	Renville
	Rock
	Swift
	Yellow Medicine