



*City Council Memorandum*

**To: Mayor Fasbender & City Councilmembers**  
**From: Dan Wietecha, City Administrator**  
**Date: November 20, 2023**  
**Item: Commercial Waste Characterization Study**

**Council Action Requested:**

Informational only.

**Background Information:**

The City previously received an incentive/grant “to reduce the costs to the payers of solid waste collection services in the City or to implement the solid waste strategies and tactics in the Dakota County Solid Waste Master Plan, or both.”

The City used some of these funds for its 2022 share of the new Solid Waste & Recycling Coordinator shared with the Cities of Farmington and Rosemount and to purchase “Big Belly” trash and recycling bins for the downtown.

In November 2022, the City contracted with Foth Infrastructure & Environment for a Commercial Waste Characterization Study to be conducted in summer 2023. The intent of the study is to learn about current practices, establish baseline data, and identify opportunities for improvements.

**Financial Impact:**

N/A

**Committee Discussion:**

N/A

**Attachments:**

- Report: Commercial Recycling Study, November 2023

Report

# **Commercial Recycling Study**



**City of Hastings**  
Hastings, Minnesota

November 2023

Project ID: 22H024.00

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November 6, 2023

Dan Wietecha, City Administrator  
City of Hastings  
101 4<sup>th</sup> Street East  
Hastings, MN 55033

Re: Commercial Recycling Study – City of Hastings, Minnesota

Dear Dan Wietecha:

Foth Infrastructure & Environment, LLC (Foth) is pleased to present the findings from the City of Hastings (City) Commercial Recycling Study. At the City's request, and with input from the City and Dakota County, Foth developed procedures to investigate current recycling practices from a sample of commercial businesses, thereby establishing baseline data for future comparison. Additionally, potential improvements and/or opportunities for City-provided support were identified. The study assessed over 100 businesses from six different business types.

The established procedures included visual assessment and physical investigation of waste and recycling. Conducted procedures were designed for repeatability and are described in the report. Future study, if conducted following the established procedures, will allow for comparison to the baseline data and can validate any applied improvements or support.

Foth appreciates the opportunity to assist the City with its recycling goals, and the assistance from the City and Dakota County with the study. Please contact the undersigned with any questions on the study or the enclosed report.

Sincerely,

Foth Infrastructure & Environment, LLC



Nathan Klett, P.E.  
Client Team Leader  
Licensed in MN



Angie Lemar  
Project Environmental Scientist

cc: Renee Burman - Dakota County

Enclosure

# Commercial Recycling Study

Project ID: 22H024.00

Prepared for  
**City of Hastings**  
101 4<sup>th</sup> Street  
Hastings, MN 55033

Prepared by  
**Foth Infrastructure & Environment, LLC**

November 2023

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# Commercial Recycling Study

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# Commercial Recycling Study

## Executive Summary

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The City of Hastings (City) retained Foth Infrastructure & Environment LLC (Foth) to conduct a commercial recycling characterization study, which was conducted to assess compliance with the recently updated City and Dakota County (County) ordinances. The ordinances require recycling of specified items (Designated List of Recyclables [Recyclables]) and require that other specified items (Designated List of Contaminants [Contaminants]) are not placed in the recycling container.

The study was designed to establish baseline data of recycling composition by weight at a sample of businesses, assess and characterize the presence of recycling within samples of trash, evaluate compliance with recycling preparation requirements, and provide recommendations for actions to increase the proportion of recycling to trash.

Initially, locations of interest for visual assessment and physical waste sorts were identified. A list of potential business locations based on North American Industrial Classification System (NAICS) Code was provided by the City. The locations of interest for the visual assessment were selected based on locations along the commercial corridors of Vermillion Street and Highway 55. Agreement for the physical waste sorts was obtained from the locations of interest and select businesses were contacted based on proximity to the waste sort location and selection of breadth of business types. A total of seven businesses from five NAICS codes agreed to participate in the physical waste sorts.

The visual assessments were conducted on over 100 businesses; and recycling and trash container sizes, NAICS Codes, and hauling service provider were recorded. The visual assessments indicated that 18% of the assessed businesses lacked a recycling container, and hauling service was provided by Tennis Sanitation and Highland Sanitation at 65% of the assessed businesses.

The physical waste sort was conducted at the County maintenance building in proximity to the selected locations. While the available quantity of sample material depended on pick-up day for each business, sufficient material was sampled at the participating businesses. The results of the study indicate that the composition of recyclables and the presence of recycling in trash varied by business and likely by business type. Cardboard was recycled at the highest percentage among four of the five businesses with both a recycling container and available sample, ranging from 79 to 100%. Contamination of the recycling was 0 to 11% by weight for the five business with both a recycling container and available sample. The presence of recycling in trash samples ranged from 3 to 49%, varying by business type. Recycling samples were generally observed to be in compliance with recycling preparation requirements, with residual food on recyclable items as the most common occurrence of improperly prepared recyclables.

Recommendations include providing targeted support based on business types; and working with businesses and haulers to ensure businesses are provided with recycling containers. Specific actions are recommended within the Recommendations section, and procedures and materials for duplicating the commercial recycling study are included in Appendix D to validate the recommended actions, if implemented, and assess recycling rates over time.

## 1. Introduction

Dakota County (County) and the City of Hastings (City) recently updated their respective ordinances incorporating new recycling requirements for businesses, which took effect in 2021. On behalf of the City, Foth Infrastructure & Environment, LLC (Foth) conducted a study to assess compliance with the ordinances and identify opportunities for increasing recycling.

### 1.1 City and County Requirements

The County established a 2018-2038 Solid Waste Management Plan in 2018 defining Dakota County's vision for solid waste management and incorporating the aggressive new recycling goal set forth for the metropolitan area by the Minnesota Pollution Control Agency (a 75% recycling rate by 2030). Subsequently, the County's Ordinance 110 was revised, requiring recycling based on the Designated List of Recyclables (Appendix A) and prohibiting placement of the Designated List of Contaminants in recycling containers (Appendix A). The City ordinance Chapter 50.06 was also amended to incorporate the County requirements.

The County has published a Business Compliance Brochure (Appendix B) that summarizes recycling requirements for all businesses in the County and states that all commercial property owners and managers are required to:

1. Have recycling service.
2. Recycle designated materials.
3. Co-locate recycling with trash containers.
4. Label containers.
5. Provide recycling education.
6. Submit an annual report to the County.

### 1.2 Commercial Recycling Study

The City is interested in benchmarking compliance with the recycling requirements and identifying potential improvements and/or opportunities for City-provided support to meet the stated recycling goal. Foth, with City and County input, developed study procedures to investigate current recycling practices among City businesses.

The study was designed to establish and document investigation procedures, record baseline data for future comparison, measure compliance with the recycling regulation, and identify specific tasks to increase recycling. The study was designed for repeatability and any future studies, if conducted following the established procedures, will allow for comparison to the baseline data and can validate any applied improvements or support.

The following information was considered necessary to meet the study objectives:

1. Determine recyclable material types and quantities in recycling and trash receptacles by business type.
2. Determine the major contaminant type in recycling receptacles.
3. Determine compliance with recycling preparation requirements including placing items loose in containers.

In order to obtain breadth of information across a variety of business, the following business types were targeted:

1. Health services;
2. Restaurant/drinking establishments;
3. Lodging;



4. Retail; and
5. Manufacturing.

A sample of representative City businesses from the referenced business types were identified for the study.

## 2. Methodology

The study was organized to select study participants, conduct visual assessments, conduct physical waste sorts, compile data, and evaluate results. Initially, locations of interest were identified based on concentration of business type along commercial corridors. Visual assessments were designed to collect specified data from businesses along the locations of interest. A subset of the identified businesses agreed to participate in the physical waste sort. Methodology and procedures are described in the following sections.

### 2.1 Locations of Interest/Study Participants

The City provided a list of businesses that contained 296 businesses along with priority business types to include in the study. Businesses were identified based on the North American Industry Classification System (NAICS) and the associated NAICS codes were assigned to each business. The priority business types, as provided by the City, are as follows:

- ◆ Manufacturing (NAICS code 31-33)
- ◆ Retail Trade (NAICS code 44-45)
- ◆ Health Care and Social Assistance (NAICS code 62)
- ◆ Accommodation and Food Services (NAICS code 72)

Note that while food and grocery stores were initially identified as a priority business, these business types were included in a separate focused study conducted by the County and were therefore excluded from this study.

The businesses in the City that also met the priority business criteria were used to develop the locations of interest for the visual assessments and the physical waste sorts. The locations of interest for the visual assessments were based on routing generally along the main commercial corridors of the City. Agreement was obtained from the businesses for participation in the physical waste sort. Potential businesses from the initial list were refined based on proximity to the sorting location. Potential businesses were contacted via letter (Appendix C) and/or email with follow-up phone call or visit to obtain participant agreement.

### 2.2 Visual Assessments

The following data was collected for each location assessed:

- ◆ Estimate of NAICS Code
- ◆ Estimated trash container size
- ◆ Estimated recycling container size, if available
- ◆ If trash and recycling containers were shared with other businesses
- ◆ Hauler
- ◆ Other relevant notes

### 2.3 Physical Waste Sorts

The physical waste sort was conducted by collecting samples from the recycling and trash containers at participating businesses and transporting the samples to the sorting station. The samples were sorted, classified, and weighed. All relevant data was recorded on field forms. Following completion of the

measurements, all recycling and trash were properly disposed, and the sorting station was cleaned to remove residual materials. The physical waste sort was conducted by a four-person team.

Procedures and templates based on the completed physical waste sort for use in a future study are included in Appendix D. The following information is included in Appendix D: Procedure, Sorting Station Layout Map, Equipment List, Tote Labels, and Field Forms.

### 2.3.1 Sample Collection

A two-person team accessed the recycling and trash containers at each business location. Appropriate personal protective equipment (PPE) was utilized as well as ladders if dumpster access was necessary. A representative sample size was defined as a minimum of 25% of the available material or three 32-gallon garbage cans. Samples were placed into the 32-gallon garbage cans and transported to the sorting station.

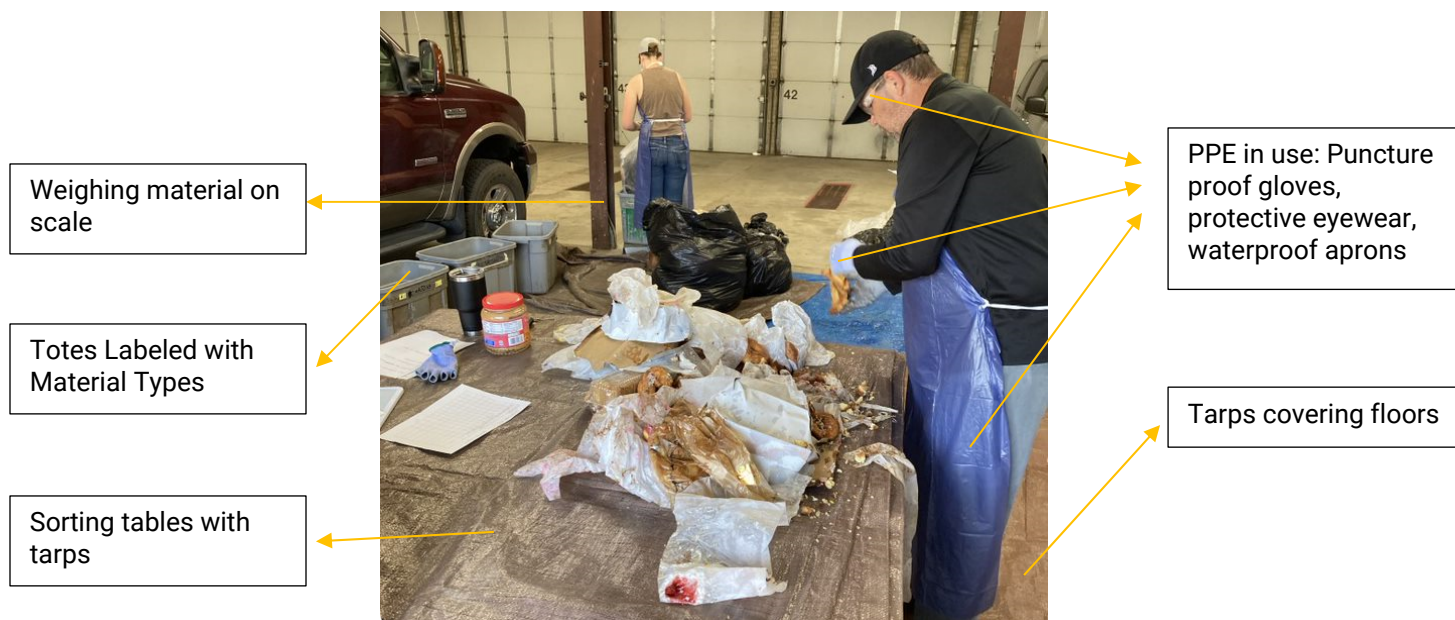
### 2.3.2 Sorting Station

The Dakota County Maintenance Building, 900 County Road 47, is located near the commercial corridors of the City and was selected as the sorting location. The building consists of a covered garage with large overhead doors which can be opened to mitigate odors. The sorting station (see Figure 2-1) was set up as intake, sorting, measuring, and disposal areas. The intake area provided for placement of incoming sample material. The sorting area included tables and tarped floor for a sorting workspace and totes for placement of the sorted material. Several approximate 27-gallon totes were labeled per the following categories:

- ◆ PAPER: Newspaper and inserts, magazines and catalogs, mail and office papers;
- ◆ CARDBOARD: Paperboard, corrugated cardboard;
- ◆ CARTONS (aseptic packaging and gable top cartons): Beverage, broth and soup cartons, juice boxes, milk cartons;
- ◆ METAL CANS: Food and beverage aluminum, tin, and steel cans;
- ◆ GLASS BOTTLES AND JARS: Food and beverage bottles and jars;
- ◆ RECYCLABLE PLASTIC BOTTLES, CONTAINERS AND JUGS: Recyclable polyethylene terephthalate (PET) (Society of the Plastics Industry [SPI] code #1), such as beverage bottles, Recyclable high-density polyethylene (HDPE) (SPI Code #2), such as beverage, milk and laundry jugs, and recyclable polypropylene (PP) (SPI #5), such as food tubs;
- ◆ CONTAMINANTS: Found in recycling; and
- ◆ RECYCLING: Found in trash.

The first six categories represent the Designated List of Recyclables. The measuring area included a scale of sufficient size and the disposal area consisted of the dumpsters located on site or at other County owned facilities offsite.

**Figure 2-1  
Sorting Station Set Up**



### 2.3.3 Sorting Process

Upon intake, sample information including generator identification was recorded on the field form. Each item in the sample containers was removed and examined. Specific attributes were noted on the field form if warranted, including the preparation of recycled items. All items were placed in the most appropriate sorting tote. Following the sort process, each tote was weighed. Tote contents were placed in the appropriate County dumpster, and the sorting station was cleaned sufficiently between samples to maintain adequate housekeeping.

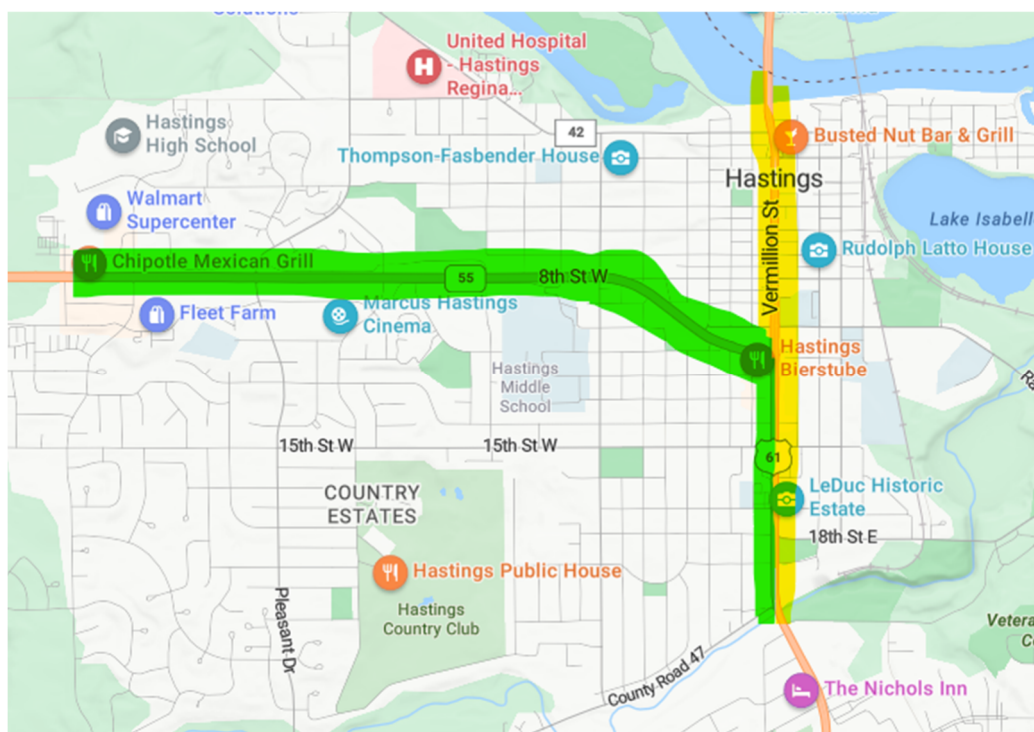
## 3. Results

Locations of interest were developed with input by the City and County based on the list of businesses with the NAICS codes. The visual assessments were conducted on Monday, June 26<sup>th</sup> by Foth staff. Obtaining business agreement for the physical waste sorts was completed and the physical waste sorts were conducted on Tuesday, August 8<sup>th</sup> and Wednesday, August 9<sup>th</sup> by Foth staff and representatives from the City and County.

### 3.1 Locations of Interest/Study Participants

Two sections of the City were identified as the locations of interest for the visual assessments. The sections are shown in the Visual Assessment Routes Map (3-1). Generally, the locations of interest were defined as Vermillion Street between Highway 47 and the Mississippi River as shown in yellow, and Highway 55 between Vermillion Street and General Sieben Drive as shown in green. These locations consist of the City's main commercial corridors.

**Figure 3-1  
Visual Assessment Map**



A targeted list of potential businesses was developed for contact to obtain agreement from study participants. The targeted list met the qualifications of prioritized business type based on NAICS code and in proximity to the sorting station on or near to Vermillion Street. The resulting list was comprised of 28 businesses. Each business was contacted via letter and/or email (see Appendix C) to request participation in the study and response to the enclosed survey of current waste services. Follow-up phone calls were required in some cases. Seven businesses agreed to participate, and the results are summarized as follows:

**Table 3-1  
Targeted Businesses**

<b>Business Type</b>	<b>NAICS Code</b>	<b>Number of Potential Businesses</b>	<b>Agreed to Participate</b>	<b>Participants/Notes</b>
Manufacturing	31-33	4	1	<b>Manufacturer</b> ; sales and assembly of industrial parts
Retail	44-45	7	1	<b>Retail</b> ; shared dumpsters between a laundry and a liquor store
Health Services	62	4	1	<b>Day spa</b> (and short-term lodging rental)
Arts, Entertainment, and Recreation	71	1	0	Declined to participate
Accommodation & Food Service	72	8	3	<b>Bakery, Restaurant A, Restaurant B</b>
Professional, Scientific, Technical Services	81	4	1	<b>Graphic Design</b>

Prepared by: AAL1  
Checked by: NOK

The study participant label is indicated above in bold italics. Note the list of business types differs slightly from the initial City priority business type list based on the presence of business types in the selected location and the similarity to the initial list. A total of eight business declined to participate in the study and no response was received from the remaining 13 businesses.

### 3.2 Visual Assessment Results

The visual assessments were conducted by observing and recording the required data items from the businesses located along the specified routes. The estimate of NAICS code (business type) were recorded. The recycling and trash container locations were observed to document approximate container sizes, and the apparent hauler based on container stickers or branding. A total of 107 businesses were assessed and business types are summarized in Table 3-2.

**Table 3-2**  
**Summary of Businesses by NAICS Code**

Business Type	NAICS Code	Number of Businesses
Manufacturing	31-33	1
Retail Trade	44-45	21
Health Services	62	3
Arts/Entertainment	71	3
Accommodation & Food Service	72	37
Professional, Scientific, Technical, Other Services	81	42
<b>Total</b>		<b>107</b>

Prepared by: AAL1  
Checked by: NOK

#### 3.2.1 Container Sizes

Observed container sizes for trash and recycling are as follows:

**Table 3-3**  
**Business Container Sizes Observed**

Container Type	Trash	Recycling
96-Gallon Roll Cart	29	33
2-yard	33	20
4-yard	29	22
6-yard	7	7
8-yard	3	6
Roll off Dumpster	5	0
None	1	19
<b>Total</b>	<b>107</b>	<b>107</b>

Prepared by: AAL1  
Checked by: NOK

The three smallest trash container sizes were observed at 85% of the businesses assessed. Please note that a recycling container was observed at one business but not a trash container. The three smallest

recycling containers were observed at 70% of the businesses assessed. A recycling container was not observed at approximately 18% of businesses assessed.

### 3.2.2 Haulers

Haulers servicing the assessed businesses, as observed from apparent stickering or branding of the trash and recycling containers, are as follows:

**Table 3-4  
Summary of Haulers**

Hauler	Locations
Tennis Sanitation	49
Highland Sanitation & Recycling	20
Republic Services	13
WM	11
Other/Unknown	7
Nitti Sanitation	6
Advanced Disposal	1
<b>Total</b>	<b>107</b>

Prepared by: AAL1  
Checked by: NOK

The data collected indicates that Tennis Sanitation had approximately 46% of the market share followed by Highland at approximately 19% of the market share.

Each of the top five haulers serviced locations without recycling containers. Thirty-six percent of WM's locations were without recycling containers and 10 to 30% of the remaining four haulers' locations were without recycling containers. Ten percent of Tennis' locations were without recycling containers.

## 3.3 Physical Waste Sort Results

The physical waste sort participants responded to the survey and allowed the sort team access to the trash and recycling dumpsters. The physical waste sort was conducted on August 8 and 9, 2023. Measured weights of the recycling and trash sorts are detailed in Table 1 and on Figures 1, 2, and 3 (at the end of this report behind the Tables and Figures tabs) and summarized in the following sections. All sorted recyclable items were qualitatively assessed for compliance with preparation requirements and the results are discussed in the following sections with photos.

### 3.3.1 Recycling Material Composition

The composition of the sampled recyclable material is detailed in Table 1 and summarized on Figure 1. Note the Graphic Design business did not have a recycling container, and the recyclable container for the Bakery had been emptied prior to the sample collection, so no sample was available.

The composition of recyclable material varied among the five business types that had a recycling container and available sample. Cardboard was recycled at the highest proportion by weight at four (Manufacturer, Retail, Restaurant A, and Restaurant B) of the seven businesses, ranging from 79 to 100% of the recycling and averaging 85%. The composition of the remaining recyclables varied by business.

Recycling at the Day Spa business was distributed among plastic (27%), glass (24%), paper (22%), cardboard (14%), and metal cans (12%).

Contaminants identified in the recycling samples were limited to 0 to 4% at four of the businesses, and 11% at the Restaurant A business.



*Photos indicating properly flattened cardboard in the recycling containers.*

### 3.3.2 Recyclables in Trash Material Composition

The composition of the recycling in the trash samples are detailed in Table 1 and summarized on Figures 2 and 3.

Percentages of recyclables in trash ranged from 3 to 49%. Cardboard, paper, and glass comprised the highest percentages of improperly disposed categories. The three food service businesses had the lowest percentages, ranging from 3 to 14% of recyclables in the trash samples. Retail, Day Spa, and Graphic Design percentages of recyclable in trash ranged from 25 to 31% with cardboard as the item of concern. The trash sample from the Manufacturer contained 49% recyclable material which was mainly comprised of paper and cardboard.

Fluorescent light bulbs were observed in one trash container.

### 3.3.3 Capture Rates of Recycling by Business Type

The capture rate for recycling measures the percentage of recyclable material that is captured out of the waste stream, i.e., should all of a recyclable material be placed in the recycling container (and none in the trash container), the capture rate is 100%. Capture rates are detailed in Table 1.

While the capture rate ranged from 0 to 100%, the variability appears to be a function of sample size and/or low weights of recyclable materials in the sample. However, the capture rate for two businesses appears to be low and not a function of material weight. The Manufacturer's capture rate for paper is 40%; 9.7 pounds of recyclable paper was present in the trash sample while 6.4 pounds of recyclable paper was present in the recycling sample. The Day Spa's capture rate for glass is 40%; 3.5 pounds of recyclable glass was present in the trash sample while 2.3 pounds of recyclable glass was present in the recycling sample.

### 3.3.4 Qualitative Assessments of Recycling Compliance

Recycling items were qualitatively assessed for compliance with the ordinance requirements. Photos are included below.

Recycling contaminants, when observed, were typically improperly prepared recyclables (e.g. food left in containers) and non-recyclable types of plastic (e.g. films or other non-recyclable plastics). Recyclable food or beverage containers containing residual food or liquid was observed and more common at the food service business types. Additionally, plastic film and plastic containers were observed in the recycling sample that were not classified as recyclable material. In some cases, the plastic materials are similar to recyclable materials.

Visual assessments of the recycling materials indicate proper preparation of most materials, noting paper and cardboard, and materials were loose in bins. Bagged recyclables in the recycling containers were not observed.



*The above images show containers with food and liquids still inside making them contaminated recyclables.*



*The above image indicates similar looking plastics observed in the recycling container; however, both #1 (recyclable) and #6 (non-recyclable) materials are shown.*

## 4. Discussion

### 4.1 Study Procedures

Business representatives appeared more likely to participate when informed that the study was informative and not a compliance or enforcement study, and when told that a third-party contractor would



be leading the study. Barriers to participation included time and reluctance to sorting their trash and recycling.

Sample quantity was an issue as it appears that the business representatives may be uninformed as to the pick-up day. An accurate pick up schedule can ensure adequate sample quantity and may require coordination with the hauler.

Agreement from business owners may not be legally necessary; pursuing alternate methods of procuring samples may produce greater sample quantity and quality (e.g., working directly with haulers).

Procedures and templates for future study are included in Appendix D and are based on the completed study.

## **4.2 Recycling Materials**

The visual assessments indicated that 19 businesses did not have a recycling container.

Recycled materials appear to vary by business type. Cardboard comprises the highest percentage of recycled material composition, had a relatively high capture rate, and appears to be properly prepared. Several of the participating businesses receive quantities of goods and therefore generate cardboard.

The percentage of contaminants in the recycling samples was low. Improperly prepared recyclables were generally comprised of containers with residual food or liquid, more commonly at the food service businesses. Hazardous materials (fluorescent bulbs) were also observed.

The percentage of recycling in trash varied by business type. Beverage containers were observed in the trash.

### **4.2.1 Manufacturer**

This Manufacturer generates foam packaging materials for its products, office paper, cardboard, and other waste. The foam packaging material is not currently recycled. The percentage of recyclables in trash of this Manufacturer were 49%, the highest of the study participants. Office paper comprised the majority of this material.

### **4.2.2 Retail**

Waste and recyclable materials at the Retail business may be generated from customers as well as business service. Since these materials may be coming from customers, education may be more challenging.

### **4.2.3 Day Spa**

Waste materials generated from the Day Spa appear to be consistent with residential waste composition, likely due to the presence of the short-term lodging rental on site.

### **4.2.4 Bakery and Restaurants**

Results from the Bakery and Restaurants A and B generally showed high capture rates and low percentages of recycling in trash. Improperly prepared materials generally consisted of residual food on recyclable containers.

### **4.2.5 Graphic Design**

The Graphic Design business did not have a recycling container; recycling waste was primarily generated from employee use and not business-related recycling.

## 5. Conclusions

- ◆ Businesses recycle to a varying degree, with cardboard appearing to be the highest quantity of recycled material across the samples.
- ◆ Businesses that do not receive or generate quantities of products may have a recycling composition consistent with residential waste. Businesses that receive or generate products have recycling compositions specific to the business process. Businesses, regardless of process or type, generally support employees, who generate waste such as paper and beverage containers.
- ◆ Support and education from public entities is likely best targeted to the specific business type, while a general office approach (for lunch areas, and office paper) may be universally applied.
- ◆ Manufacturing businesses and “other” service businesses (such as the Graphic Design) likely require specific and targeted support due to the business processes.
- ◆ Food service businesses may require support on proper preparation with regard to residual food on recyclables, and the use of reusable service ware of all kinds.
- ◆ Future recycling sorts can measure improvements in recycling rates, especially by tracking data in Table 3.

## 6. Recommendations

- ◆ Recommended sort logistics for potential future use are included in Appendix D.
- ◆ Follow up with the hauling companies and/or the businesses is recommended to identify and encourage the placement of recycling containers at the locations that lack containers.
- ◆ Due to the high percentage of generated cardboard, “cardboard only” containers may be warranted on a case-by-case basis, but a single recycling container for all recyclables may be more effective for improving recycling.
- ◆ Potential education efforts on removing the residual food waste from recyclables may be warranted. Note the potential cost and environmental impact of water use (for cleaning) should be considered.
- ◆ Target education universally to business breakrooms and office areas to minimize beverage containers and office paper in the trash.
- ◆ Target education efforts to both managers and all levels of employees.
- ◆ Businesses may require focused education and/or support to increase recycling due to the specific generating processes. Grouping and targeting by business type is recommended.
  - Due to the relative similarity of the food service businesses, and the number of food service businesses in Hastings, the first action at increasing recycling rates may be efficiently applied at these businesses. Actions are recommended to verify that recycling of glass and plastic beverage containers is occurring and educate employees to recycle in break rooms and offices.
- ◆ Future study may be recommended by pursuing alternate methods of sample procurement with the objective to obtain adequate sample quantity and quality. Permission from the businesses may not be legally necessary, and working with haulers may be preferred. Planned studies may

be noticed in City newsletters in lieu of direct agreement. The legal aspects should be verified, and notice may be required to the property owners as opposed to businesses.

## Tables

**Table 1 - Results of Recycling Sort  
City of Hastings Commercial Recycling Study**

	Business ID Business Type NAICS Code Hauler	Manufacturer Manufacturing 31-33 Tennis	Retail Retail Trade 44-45 Highland	Day Spa Health Services 62 Highland	Bakery Food Service 72 Nitti	Restaurant A Food Service 72 Highland	Restaurant B Food Service 72 Tennis	Graphic Design Prof. Services 81 Tennis	Total	Percent of Total by Category
<b>Recycling Container Sample</b>										
Container Size On-site	CY	4	4	0.5	2	2	2	none		
Paper	lbs	6.4	0.6	2.1		0.2	0.0		9.3	6%
Cardboard	lbs	32.8	33.6	1.3		10.1	56.9		134.7	83%
Cartons	lbs	0.0	0.0	0.0		0.1	0.0		0.1	0%
Metal Cans	lbs	1.3	0.2	1.1		0.3	0.1		3.0	2%
Glass Bottles/Jars	lbs	0.0	0.0	2.3		0.0	0.0		2.3	1%
Plastic (recyclable)	lbs	0.5	5.6	2.5		0.6	0.0		9.2	6%
Contaminants	lbs	0.7	1.6	0.1		1.4	0.0		3.8	2%
Total in Recycling Container	lbs	41.7	41.6	9.4	0.0	12.7	57.0		162.4	
Percent Contaminants	%	2%	4%	1%		11%	0%		2%	
<b>Trash Container Sample</b>										
Container Size On-Site	CY	4	4	0.5	2	8	2	4		
Incoming Sample	lbs	27.4	5.1	17.0	117.9	149.4	9.1	16.8	342.7	
Total Trash	lbs	14.0	3.8	11.8	101.5	144.9	8.8	12.4	297.2	
Recyclables in Trash Container										
Paper	lbs	9.7	0.0	0.0	0.1	2.2	0.0	0.6	12.6	28%
Cardboard	lbs	2.5	1.0	0.8	1.8	1.4	0.0	2.6	10.1	22%
Cartons	lbs	0.0	0.0	0.0	0.4	0.2	0.0	0.0	0.6	1%
Metal Cans	lbs	0.6	0.2	0.2	1.1	0.2	0.2	0.4	2.9	6%
Glass Bottles/Jars	lbs	0.0	0.0	3.5	10.6	0.0	0.0	0.0	14.1	31%
Plastic (recyclable)	lbs	0.6	0.1	0.7	2.4	0.5	0.1	0.8	5.2	11%
Total	lbs	13.4	1.3	5.2	16.4	4.5	0.3	4.4	45.5	
Percent Recyclables in Trash	%	49%	25%	31%	14%	3%	3%	26%		
<b>Recycling Capture Rate</b>										
										<i>Average Rate</i>
Paper	%	40%	100%	100%	na	8%	na	0%	50%	
Cardboard	%	93%	97%	62%	na	88%	100%	0%	73%	
Cartons	%	na	na	na	na	33%	na	0%	na	
Metal Cans	%	68%	50%	85%	na	60%	33%	0%	49%	
Glass Bottles/Jars	%	na	na	40%	na	na	na	0%	na	
Plastic (recyclable)	%	45%	98%	78%	na	55%	0%	0%	46%	
Overall	%	75%	97%	64%	na	72%	99%	0%		

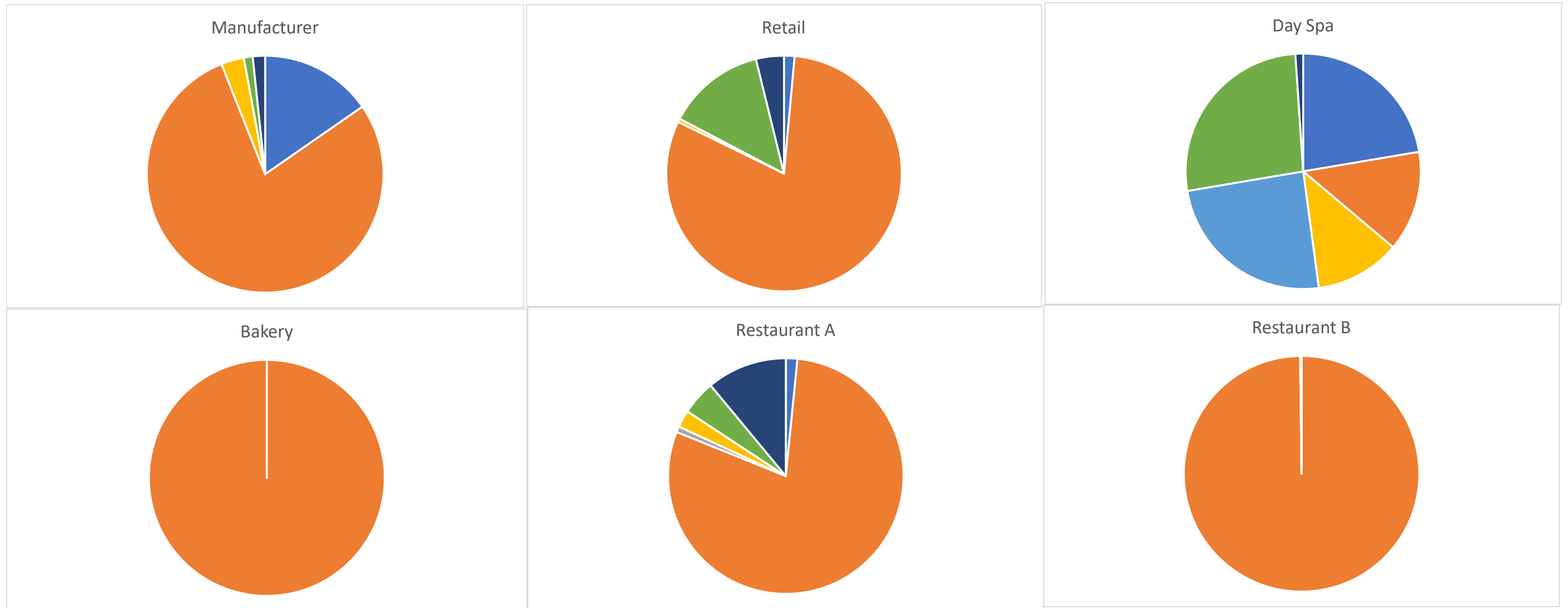
**Notes**

Bakery recycling was picked up prior to sample collection.  
na = not applicable  
CY = cubic yards  
Average recycling capture rate does not include bakery.

## Figures

## Recycling Material Composition Percent of Total Recycling Sample by Business

**FIGURE 1** VIII-07



- Paper
- Cardboard
- Cartons
- Metal Cans
- Glass Bottles/Jars
- Plastic (recyclable)
- Contaminants

Notes:  
 See Table 1 for weights of recycling materials in sample  
 Graphic Design did not have a recycling container  
 Bakery based on visual observation conducted prior to waste sort.

## Trash Material Composition Percent of Total Trash Sample by Business

**FIGURE 2**  
VIII-07



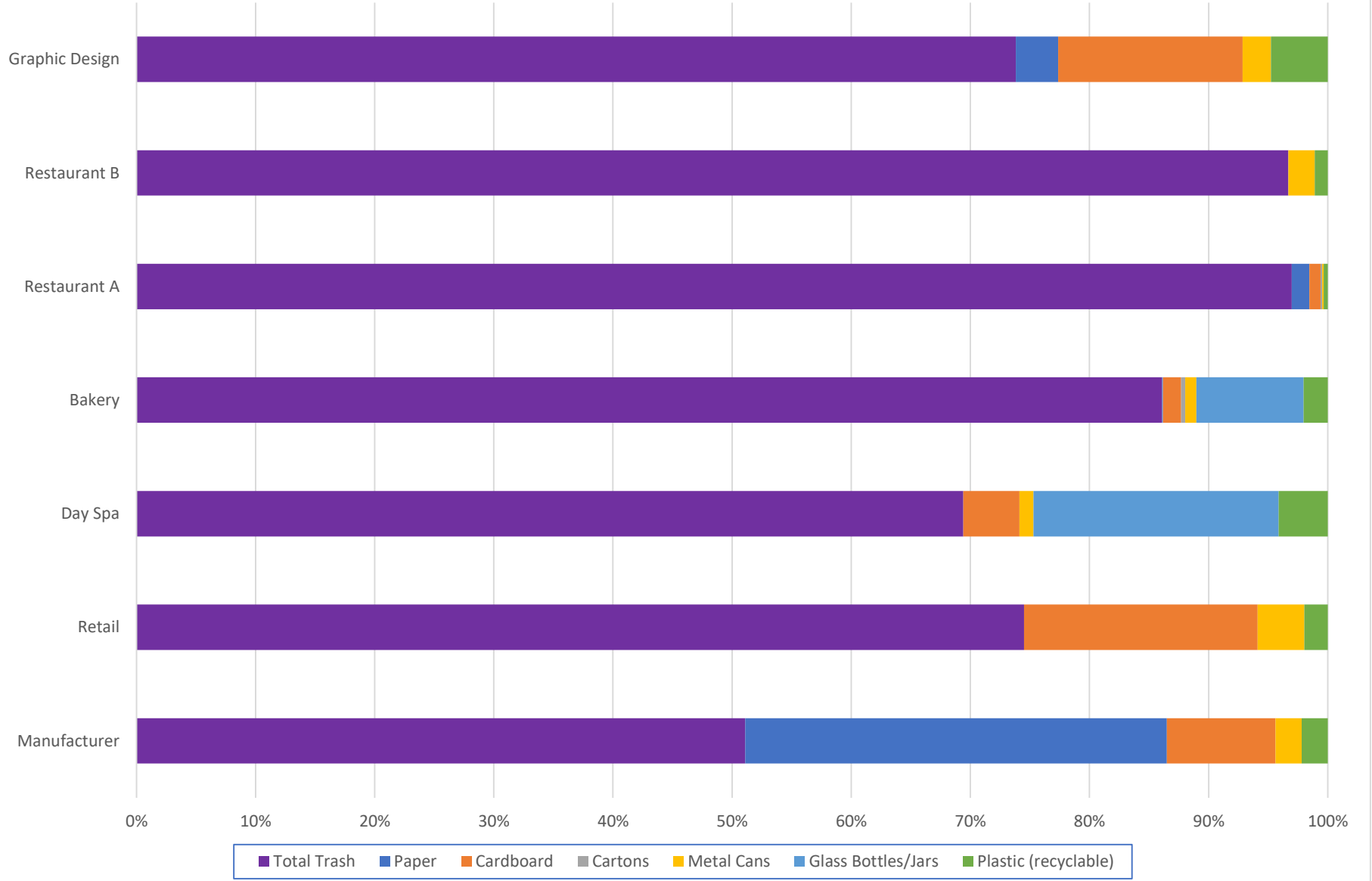
- Trash
- Recyclable Material in Trash Sample
- Paper
- Cardboard
- Cartons
- Metal Cans
- Glass Bottles/Jars
- Plastic (recyclable)
- Contaminants

See Table 1 for weights of materials in sample



**Trash Material Composition**  
**Percent of Total Trash Sample by Business**

**FIGURE 3**



**Appendix A**  
**Designated Lists of Recyclables and Contaminants**

## DESIGNATED LISTS OF RECYCLABLES AND CONTAMINANTS

### DAKOTA COUNTY ORDINANCE 110, SOLID WASTE MANAGEMENT

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#### A. “DESIGNATED LIST OF RECYCLABLES”

This list represents the minimum list of recyclable materials that haulers must collect in single-stream recycling and generators must place into carts or dumpsters for haulers to collect. Property owners, managers, and event sponsors shall ensure the designated list of recyclables are collected for recycling.

##### **PAPER**

- Newspaper and inserts
- Magazines and catalogs
- Mail and office papers

##### **CARDBOARD**

- Paperboard
- Corrugated cardboard

##### **CARTONS** (aseptic packaging and gable top cartons)

- Beverage, broth and soup cartons
- Juice boxes
- Milk cartons

##### **METAL CANS**

- Food and beverage aluminum, tin, and steel cans

##### **GLASS BOTTLES AND JARS**

- Food and beverage bottles and jars

##### **RECYCLABLE PLASTIC BOTTLES, CONTAINERS AND JUGS**

- Recyclable PET (SPI code #1), such as beverage bottles
- Recyclable HDPE (SPI Code #2), such as beverage, milk and laundry jugs
- Recyclable PP (SPI #5), such as food tubs

*SPI = Society of Plastic Industry*

**B. “DESIGNATED LIST OF CONTAMINANTS” FOR RECYCLING**

This list represents items that generators cannot place into recycling carts or dumpsters for recycling collection. Items on this list may be accepted at or required to be managed at drop-off locations for proper recycling or disposal.

- Batteries
- Ceramic dishware
- Clothing and textiles
- Food waste
- Household hazardous waste/hazardous waste
- Non-recyclable paper products (e.g., paper napkins, paper plates and cups, paper towels)
- Pallets (plastic and wood)
- Pet and human waste, including diapers
- Pharmaceuticals and medicines/medical waste
- Plastic bags and film (*residential effective upon County Board adoption, commercial starting January 1, 2021*)
- Metal cylinders (e.g., propane tanks)
- Scrap metal\* (e.g., metal pots and pans)
- Shredded paper\*
- Styrofoam™
- Tanglers (e.g., chains, extension cords, hoses, string lights)
- Trash
- Yard waste and Christmas trees
- All items banned from being placed in the trash or recycling in state or local law – including:
  - Electronics
  - Major Appliances
  - Sharps (e.g., lancets, needles, syringes)
  - Tires

\*Scrap metal and shredded paper are allowed in carts and dumpsters only if delivered to the Tennis Sanitation recycling facility.

**Appendix B**  
**Business Compliance Brochure**

# Dakota County Ordinance 110, Solid Waste Management, requires all businesses to recycle.

Commercial property owners and managers are required to:

- 1 Have recycling service
- 2 Recycle a designated list of materials
- 3 Co-locate recycling with trash containers
- 4 Label containers
- 5 Provide recycling education
- 6 Submit annual report

## Learn more

More information about the business recycling requirements and how to comply is available at [www.dakotacounty.us](http://www.dakotacounty.us), search *business recycling requirements*.

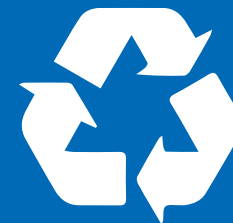


**Environmental Resources**  
14955 Galaxie Ave., Apple Valley, MN 55124

102-2-06-2022



# VIII-07 Businesses in Dakota County are required to recycle



# Business recycling requirements

County ordinance requires commercial property owners and managers to:

## 1 Have recycling service


Contract with a trash hauler for recycling collection services, or self-haul recyclables to a recycling facility. Work with your hauler to increase service levels if carts or dumpsters are overflowing.

## 2 Recycle designated materials

Provide recycling containers in buildings and on grounds to collect the Designated List of Recyclables from employees, tenants and customers. These designated materials must be collected and recycled:

- Paper
- Cardboard
- Cartons like milk & juice cartons
- Metal cans
- Glass bottles & jars
- Plastic bottles, containers and jugs numbered 



Keep the Designated List of Contaminants out of recycling such as food and liquids, plastic bags and film, plastic utensils and straws, chip bags, fast food, and candy wrappers, and Styrofoam. 

## 3 Co-locate recycling with trash containers

Wherever there is a trash container, there must be a recycling container within 10 feet. Recycling containers must be large enough to collect all recyclables in the building and on grounds, and not overflowing.

## 4 Label containers

Label each indoor and outdoor recycling and trash container with standardized labels. All labels must meet county label requirements:

- ✓ Use standardized terms: “Recycle” or “Recycling”, and “Trash” to indicate the type of waste collected.
- ✓ Be color-coded: Blue for recycling, gray or black for trash.
- ✓ Have standardized images: Recycling labels must use county-standardized images that show designated recyclable materials and include preparation instructions where applicable, such as “empty and dry items, flatten boxes”. Trash labels do not need images.

**Order or download free recycling and trash labels from Dakota County that meet these requirements.**

Replace labels if they are damaged, unreadable or if text or images conflict with county label requirements.

Waste and recycling haulers are responsible for labeling carts and dumpsters they provide to businesses.



## 5 Provide recycling education

Provide standardized recycling education at least once a year to each employee, tenant and housekeeping and custodial contractors, and any other contractor that is responsible for sorting, collecting or managing recycling. Also provide education within 30 days of a new hire or new tenant, and within 30 days of a substantial change to the waste and recycling program.

Education must cover what to recycle and how to recycle in accordance with recycling education requirements listed on the county’s website.

**Get free educational resources from Dakota County that meet these requirements.**



## 6 Submit annual report

Report recycling program effectiveness, including education activities, to Dakota County each year. The county will provide the report form.



**Appendix C**  
**Letter/Email to Businesses**



Dear City of Hastings Business Owner,

VIII-07

On behalf of the City of Hastings, Foth Infrastructure & Environment, LLC is conducting a survey of businesses to assist with the upcoming Commercial Waste Characterization Study. The goal of the Waste Characterization Study is to better understand the makeup of commercial waste so that the City can better support and plan for business recycling.

Your business has been selected as a potential candidate to be a part of the initial Waste Characterization Study. We are requesting that you fill out the survey and return your responses to us by no later than April 30, 2023. Your survey responses will help us determine what businesses will be included in our initial 2023 Study. We anticipate the initial sort happening in late May or June. We will be communicating with participating businesses throughout the process as we determine actual sort dates and logistical details.

Questions you will be asked in the survey include:

1. Business name and Contact Person information
2. Type of business
3. Days of the week and time business is open
4. Who is the trash/recycling hauler
5. Day of the week that trash/recycling is picked up
6. Size of containers for trash/recycling
7. Willing to participate in waste sort and allow Foth/City to sort their trash/recycling

You can access the survey the following ways:

- ◆ Click [HERE](#) to link to the survey.
- ◆ Use the QR code shown below to go directly to the survey from your phone.



We greatly appreciate your participation in this survey. The information that we will be able to collect from the survey, and then from the waste sort, has the potential to not only benefit your business directly but also businesses throughout the City. It will also provide valuable information that will help develop additional commercial specific recycling education materials in the future. If you have any questions about the survey or the project, please contact Angie Lemar, Foth Project Environmental Scientist, at [angie.lemar@foth.com](mailto:angie.lemar@foth.com) / (920) 496-6643.

Surveys should be completed by no later than April 30, 2023. We will be in touch about further steps by no later than May 12, 2023.

**Angie Lemar**  
Project Environmental Scientist



**Foth Infrastructure & Environment, LLC**

2121 Innovation Court, Suite 300

P.O. Box 5095

De Pere, WI 54115-5095

Office: (920) 497-2500

Direct: (920) 496-6643

Cell: (715) 347-5979

[foth.com](http://foth.com)

**Appendix D**  
**Procedures and Templates for Future Study**

# COMMERCIAL RECYCLING SORT EVENT DATA

VIII-07



Sort Location: \_\_\_\_\_

Address: \_\_\_\_\_

Sort Personnel: \_\_\_\_\_

Scale Model/Capacity/Accuracy \_\_\_\_\_

record weight of 1 container per square	CONTAINER WEIGHT			NOTES
	Quantities in pounds			
Incoming Sample				
Paper				
Cardboard				
Cartons				
Metal Cans				
Glass Bottles/Jars				
Plastic (recyclable)				
Trash				

**NOTES**

AFIX LABELS TO CONTAINERS PRIOR TO WEIGHING

Number of containers recommended: 6 ea for incoming sample, cardboard, and trash. 2 ea for paper, cartons, metal cans, glass, and plastic.

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# SAMPLE COLLECTION & SORT FORM

VIII-07

Commercial Recycling



Location: \_\_\_\_\_

Address: \_\_\_\_\_

Hauler: \_\_\_\_\_

Personnel: \_\_\_\_\_

Recy. Container Size: _____	CY	Cont. Vol. at sample (circle)	1/4	1/2	3/4	full	Date: _____
Trash Container Size: _____	CY		1/4	1/2	3/4	full	NAICS Code _____

record weight of 1 container per square	RECYCLING SAMPLE			TRASH SAMPLE			CONTAINER WEIGHT			NOTES
	Quantities in pounds									
Incoming Sample										
Paper										
Cardboard										
Cartons										
Metal Cans										
Glass Bottles/Jars										
Plastic (recyclable)										
Trash										

NOTES/CONTAMINANTS

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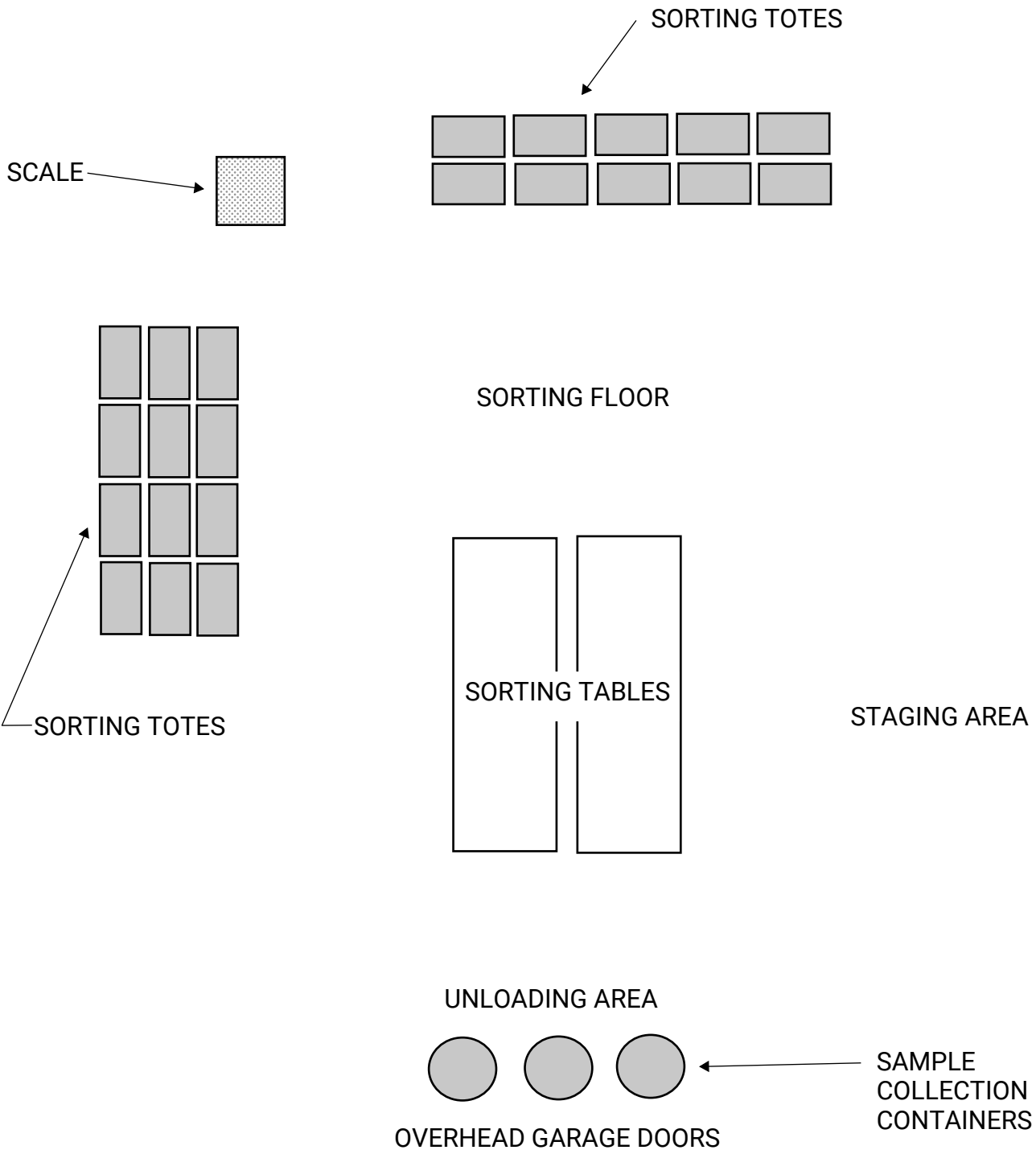
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**Equipment List**  
**City of Hastings Commercial Recycling Study**

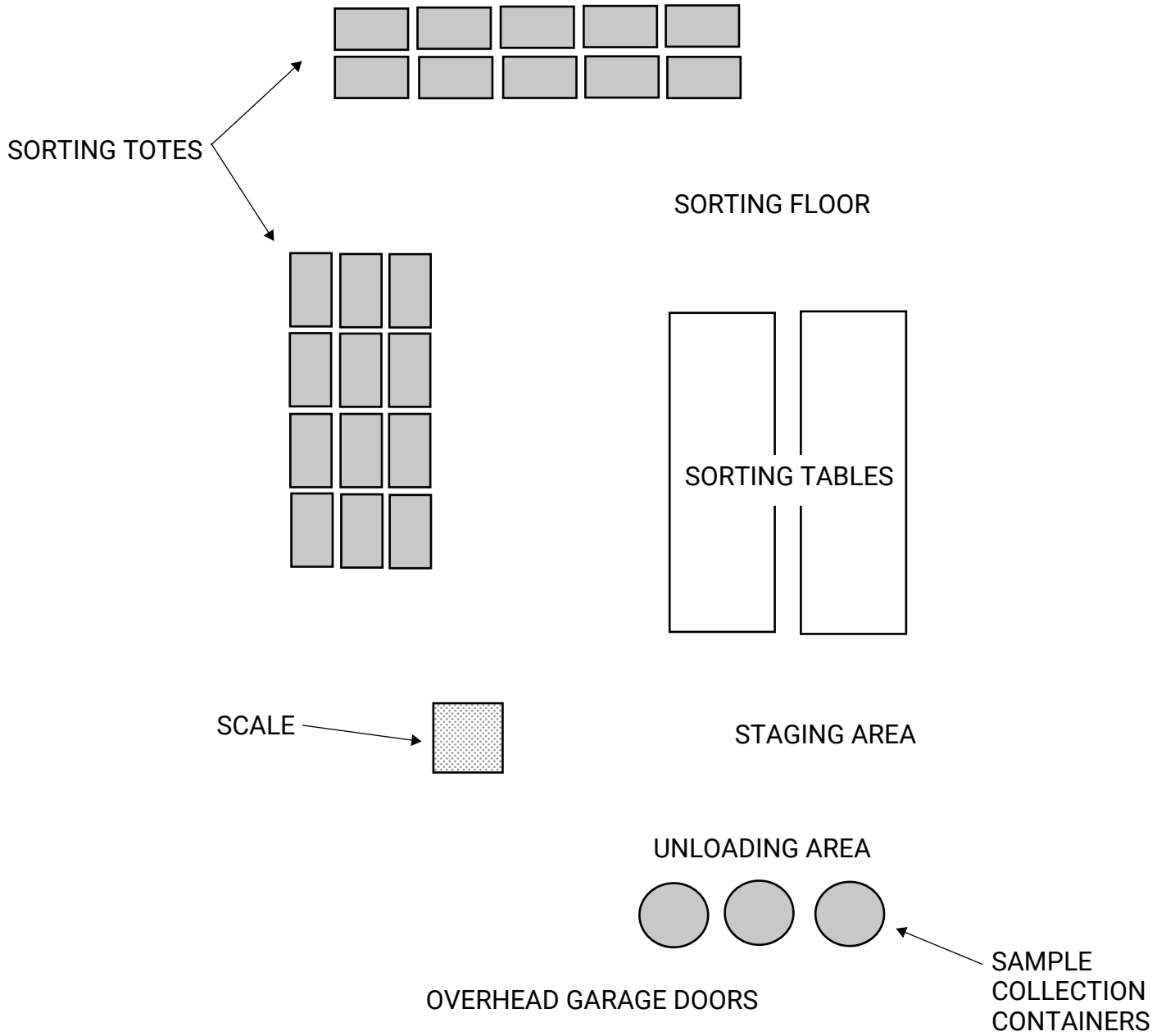
Item	Size	Quantity	Notes
<b>Sample Collection Equipment</b>			
Garbage cans with lids	32 gallon	6	
Ladder	6 ft	1	for dumpster entry
Trash grabber		1	
Shovel		1	
Data collection sheet		1 per location	
Clipboard		1/team	
Pen		1/team	
<b>Sorting Station Equipment</b>			
Folding Table	6' – 8'	2	
Tarps or 2 mil plastic sheeting	1 each	220 sq ft/day	10'x10' for floor, 2-6'x10' for two tables
Hand rakes/trowels			
Totes	27 gallon	22	
Printed Tote Labels		1/tote	
Tape			to afix labels to totes
Small whiteboard		1	
Dry erase marker		1	
Scale	see note	1	platform 18"x18" min, capacity 100 lbs min
Garbage Bags	45 gallon		
Broom		1	
Dust pan		1	
Floor Squeegee		1	
<b>Personal Protective Equipment</b>			
Nitrile gloves	as needed	1/staff/sample	may wear under cut-proof gloves
Puncture/cut proof gloves	as needed	2/staff	
Aprons/Tyvek suits	one size	1/staff/day	clothing protection
Safety goggles	one size	1/staff	
Safety boots	as needed	pr/staff	supplied by individual staff



### OPTION 1



<b>SORTING STATION MAP</b>		
COMMERCIAL RECYCLING STUDY CITY OF HASTINGS		
Date: OCTOBER 2023		Revision Date:
Drawn By: ASL	Checked By: AAL1	Project: 22H024



### OPTION 2



<b>SORTING STATION MAP</b>		
COMMERCIAL RECYCLING STUDY CITY OF HASTINGS		
Date: OCTOBER 2023	Revision Date:	
Drawn By: ASL	Checked By: AAL1	Project: 22H024

# **PAPER**

**Newspaper and  
inserts, magazines  
and catalogs, mail  
and office papers**

(print 2)



# **CARDBOARD**

Paperboard,  
corrugated cardboard

(print 6)

# **CARTONS**

aseptic packaging  
and gable top  
cartons, beverage,  
broth and soup  
cartons, juice boxes,  
milk cartons

(print 2)

# **METAL CANS**

Food and beverage  
aluminum, tin, and  
steel cans

(print 2)

# **GLASS BOTTLES AND JARS**

Food and beverage  
bottles and jars

(print 2)

# **PLASTIC BOTTLES, CONTAINERS AND JUGS**

**PET, SPI #1, beverage  
bottles, HDPE, SPI #2,  
beverage, milk and  
laundry jugs, and  
polypropylene (PP)  
(SPI #5), food tubs**

(print 2)

# **CONTAMINANTS**

## Trash in recycling

(print 2)

# **TRASH**

## Trash in Trash container

(print 6)