Regional Solid Waste Management

Appendices A-F

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Appendix A: A Report on Waste-to-Energy & Waste Utilization Options in the Rockford Region

Executive Summary

Boone and Winnebago Counties are currently exploring waste-to-energy (WTE) and waste utilization infrastructure options to increase waste diversion, boost energy resilience, and address the finite nature of landfill capacity and the associated negative environmental impacts of waste infrastructure. Current solid waste management assets in the region lack WTE components; instead, materials with diversion potential are placed in local landfills. Based on initial research conducted by the National Renewable Energy Laboratory (NREL) and waste diversion potential modeling from the University of Illinois-Chicago, Northern Illinois has the opportunity to transform and use waste for the region's energy needs (Refer to Appendix E: Public Survey, Comments & Data Methodology for more detailed information). In order to properly evaluate WTE technology and waste utilization options, and address community concerns, the composition of waste produced and routed to Boone and Winnebago Counties must be studied better through increased participation in data reporting. This is a critical recommendation, as waste stream compositions affect the success of WTE technology.

Based on current policy, incentives and regulations, NREL analysis, local feedback, and waste composition projections, the following WTE recommendations should be explored further:

1. Increase Knowledge of Local Waste Stream Compositions
2. Adapt Landfill Infrastructure for Landfill Gas Capture
3. Conduct Further Anaerobic Digestion Siting & Feasibility Analysis
4. Conduct Further Composting Siting & Feasibility Analysis

WTE opportunities for both Boone and Winnebago Counties include the adaptation of existing, traditional waste infrastructure while exploring anaerobic digestion and composting methods. Information regarding environmental impacts, waste origins, facility location, limited landfill capacity, odor control and energy resilience were taken into account in order to appropriately address local needs and concerns. This criteria should be continually re-evaluated in further pursuit of WTE options and opportunities.

Introduction

Energy recovery from waste is the conversion of non-recyclable waste materials into usable heat, electricity, or fuel through a variety of processes, including combustion, gasification, pyrolysis, anaerobic digestion (AD), and landfill gas (LFG) capture.[i] There are roughly 75 combustion facilities in the United States, with Florida and New York leading the industry.[ii]

Energy recovery is penultimate in the waste management hierarchy, meaning that other methods (e.g. source reduction) must be exhausted before utilizing waste treatment and disposal methods. However, WTE processes are growing in number with advancing technology, but remain dependent on material in waste stream compositions. For example, a waste stream with a large amount of organic material may be more suited to composting as a waste utilization method, as opposed to a waste stream with mostly non-recyclable, non-organic material. Due to the nature of the largely privatized waste industry and new technology costs, WTE technology has been fairly limited in the Northern Illinois region. Existing waste utilization efforts in the region are almost exclusive to converting wastewater sludge into fertilizer or compost through sanitation authority facilities (The Four Rivers Sanitation Authority and the City of Belvidere's Waste Water Sanitation District). Though outside both Boone and Winnebago Counties, Ameresco Inc. built a landfill gas-to-energy facility near Rockford (Davis Junction) in 2016, converting landfill gas into electricity.[iii] Moreover, increasing the local presence of WTE technology can

A Landfill in Winnebago County.

address many issues Northern Illinois residents face, a few of which are:

- Finding new sources of renewable energy generation;
- Mitigating waste-related odors and emissions;
- Dealing with diminishing landfill capacity; and
- Adapting sunsetting landfill infrastructure.

This report analyzes potential WTE/waste utilization options based on a targeted Cost-Benefit Analysis (CBA) conducted by NREL. The report also considered other factors such as public feedback, Solid Waste Advisory Committee (SWAC) suggestions, existing infrastructure, financial incentives, best practices, waste diversion rates, waste material projections, and public policy. Landfill gas capture, anaerobic digestion, and composting are each detailed in a SWOT analysis to inform which WTE technology or waste utilization method should be considered in order to support Northern Illinois' future waste management practices.

Data & Methodology

Internal Methodology

Environmental impacts, location size required, energy needs, odor control, and cost were all considered in the evaluation of each WTE method. Currently, waste is largely managed through the traditional landfill process. This process has a finite capacity and results in environmental and aesthetic impacts in addition to long term costs. These factors played a significant role in analysis, as constructing a new facility with the same constraints will potentially lack public support and feasibility. This criteria, in addition to the supporting data provided by UIC and NREL, allowed for a multi-layered initial evaluation of WTE technology for Boone and Winnebago Counties.

UIC Projections

Dr. Ning Ai and PhD candidate Junjun Zheng formed a series of waste composition and diversion projections based on historical waste generation rates in Illinois and projected population, housing units, and employment in duo counties. For more detailed information, refer to Chapter 1: Introduction within Regional Solid Waste Management: A Plan for Boone & Winnebago Counties, in addition to Appendix E: Public Survey, Comments & Data Methodology.

Cost-Benefit Analysis by National Renewable Energy Laboratory

The WTE methods and subsequent feasibility detailed in this report were made possible through technical assistance provided by a research team at the National Renewable Energy Laboratory (NREL). NREL provided a cost-benefit analysis (CBA) of food waste for various methods such as landfill gas capture, composting, and anaerobic digestion. CBA assesses a full slate of costs and benefits, including societal impacts and willingness to pay (WTP), to generate a net present value (NPV). In the CBA provided by NREL, NPV is presented as the sum of annualized costs and benefits for each facility in dollars per ton. More information regarding this CBA can be found in Appendix E: Public Survey, Comments & Data Methodology.

Low Carbon Fuel Standard

The State of California accepts fuel from other regions, provided it is used as a transportation fuel in the state. In other words, the fuel can be produced in another state, transported via pipeline or other means, and then utilized in California to obtain credits.

Source: NREL

Applicable Waste Regulations, Policy, & Incentives

The large-scale, societal benefits that renewable and sustainable energy provide are often realized without relevant compensation, and there is no exception for WTE technologies. For instance, the capture of methane derived from decomposing organic solid waste, like food waste, reduces greenhouse gas emissions and improves environmental conditions. However, there are few if any incentives available on a national scale to promote the capture of methane. Market incentive programs adopted in other regions provide a glimpse at the potential policy changes and economic incentives Region 1 could employ in order to increase the implementation of WTE practices. While the EPA and IEPA acknowledge the benefits of diverting waste from landfills, both agencies remain in favor of source reduction over WTE practices.

Federal Considerations

The US EPA recommends and encourages communities to adopt "integrated waste management" systems tailored to their needs.[iv] An integrated waste management system may include waste combustion for energy recovery. The overall goal of an integrated waste management system is to use a combination of methods to safely and effectively manage municipal solid waste, prioritizing waste reduction and diversion prior to energy recovery. However, policies that push for a clean energy economy, which have yet to be implemented at a federal level, could prove to be beneficial to the creation and advancement of WTE efforts. Waste streams are as complex as the humans that produce them, which means no single method can appropriately accommodate all waste. A combination approach to prioritize waste reduction allows for more diversion opportunities and appropriate technical management and oversight for non-traditional, hazardous waste.

Renewable Identification Numbers

The EPA's Renewable Fuel Standard (RFS) Program requires a specific volume of renewable fuel to replace or reduce the quantity of petroleum-based fuel. Renewable Identification Numbers (RINs) were created for the energy industry to reliably comply with RFS. A RIN is a ticket for a set volume of biofuel produced. Every petroleum-based energy refinery is required to blend a certain quantity of renewable fuel with non-renewable fuel, and use RINs to verify their compliance to the EPA. This makes RINs valuable to energy refiners and provides an incentive to renewable energy producers. Methane generation from WTE sites qualify as a renewable energy source for RIN credits. These RINs can be sold to refiners who have not met their blending RFS.

One drawback to programs that utilize carbon-backed currencies is their reliance on the existence of a carbon emitting network. RINs work as mechanisms to monetarily quantify carbon and its negative externalities during the transitionary period from petroleum-based energy generation to renewable energy generation. However, as carbon emission standards become increasingly more strict, infrastructure that relies on said incentives may no longer benefit from carbon-backed currencies.

State Considerations

The IEPA has several comprehensive forms of legislation to examine waste management impacts and operations in Illinois. Similar to the Federal EPA, 'Combustion with Energy Recovery' is the third order of waste diversion preference behind 'Recycling and Reusing' and 'Volume Reduction at the Source,' as established in the Illinois Solid Waste Management Act. The State of Illinois excludes municipal solid waste (MSW) combustion for eligibility in renewable portfolio standards that include solar thermal energy, wind, tree waste, hydropower, organic waste biomass, and anaerobic digestion.[v] Outside of agricultural composting sites, most composting facilities require an IEPA permit. Anaerobic digestion facilities require a permit if food scraps are collected from off-site. However, no permit is required if the digester is at the same source as the food scraps AND no off-site materials are accepted.[vi] This clearly favors decentralized digestion sites, where the excess methane can be collected and utilized by the facility.

Cap and Trade Programs

Cap and trade programs similar to those in California and Oregon allow jurisdictions to set a total amount of carbon dioxide (CO_2) emissions for polluters as well as a per ton price on carbon. Those who are reducing or mitigating emissions can sell unused emissions credits.[vii] As the respective governing body nears its zero-emissions target, the allowed carbon to be emitted decreases. Profit-seeking emitters are initially incentivized to reduce emissions and make their production methods more sustainable congruent to the expected decrease in carbon allowances. Under current market scenarios outside of this framework, firms that make their production processes less carbon intensive earn few tangible and fiscal benefits proportional to their efforts.

With cap and trade programs, those same firms are rewarded for decreasing their emissions so that their spare allowances (which can expire) can be sold to less successful or more polluting firms who have exceeded their own allowances. WTE facilities that seek to process methane for fuel may collect allowances for reducing GHG emissions while selling the excess energy. Those emission allowances can be sold throughout the established market to generate additional revenue for the facility. While the establishment of a cap and trade market can occur at a federal level, its likelihood and impact is greater at a state and regional level.

Renewable Energy Credits

The State of Illinois' Renewable Energy Credit (REC) procurements are another form of market incentives for WTE efforts. A single REC is produced when a renewable energy source generates one megawatt-hour of electricity and delivers it to the grid. RECs are a way to track and monetize the environmental benefits of avoiding carbon or pollution and compensate the generators. Once created, RECs can be purchased by businesses seeking to reduce their carbon footprint. Whereas cap and trade incentivizes carbon emitters to reduce their emissions, RECs are given to sustainable energy producers to increase their profitability to support the positive benefits renewable energy provides. RECs can provide additional revenue for facilities that produce renewable energy from unaltered organic waste, anaerobic digestion, biodiesel, and landfill gas (generated within Illinois).[viii]

WTE & Waste Utilization Options

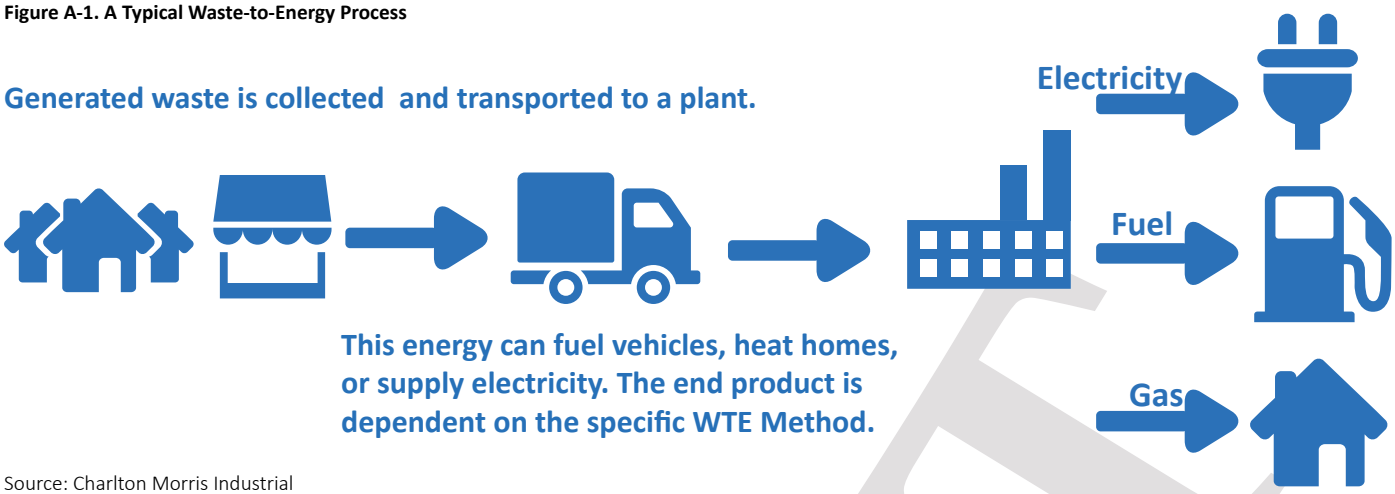
This section provides an overview of several existing waste to energy (WTE) technologies and waste utilization options specific to organic waste. The impacts and requirements associated with WTE technologies such as landfill gas capture, anaerobic digestion, and composting technologies vary and are discussed further. Lastly, an evaluation of the feasibility of these options is conducted by weighing all factors, including cost and profits.

Landfill Gas Capture

Landfill gas capture is a WTE system in which the gases produced from landfills are utilized to create power, hear, and transportation fuels. The decomposition of organic waste under anaerobic conditions in landfills produces landfill gas (LFG). This gas is composed of approximately 50 percent methane and 50 percent CO_2, with a very small percentage of other gases.[ix] Methane produced by this biological process can be converted into energy through the establishment of a gas capture system.

As of October 2021, there were 2,630 landfills located in the United States.[x] Most of these sites passively vent LFG and only 550 sites have LFG collection system in place.[xi] Some of these LFG projects flare the collected gas, while others use it beneficially to generate various forms of energy. Locally, Winnebago Landfill has a gas collection system to flare LFG, but it does not yet produce energy from this process.

Figure A-1. A Typical Waste-to-Energy Process



Source: Charlton Morris Industrial

Landfill flares are intended to control the amount of landfill gas that is produced and is a component of a larger WTE process. Landfills are required to capture emitted gases and ignite them using a flare, regardless of whether using a LFG energy system. Excess methane is ignited by a flare, converting the methane into CO_2, a less potent GHG. Landfill flares are especially important to sites expanding their WTE systems, as they aid in the control and handling of LFG.

Facilities that utilize the LFG rather than flaring it will transport gas through a well using blowers or vacuum systems to the location where the gas will be treated further. The end product that is generated varies according to the WTE pathway utilized.[xii] The pathways analyzed in this report are electricity, compressed natural gas, and combined heat and power (CHP). Further information regarding the specifications and feasibility of these pathways are detailed in this section.

Landfill Electricity

As of September 2021, approximately 70 percent of the 550 U.S. landfill facilities with WTE technology generate electricity. Landfills with existing gas collection systems have the potential to harness LFG for energy. The sale of LFG-generated energy acts as an additional revenue stream to landfills.

The waste stream must contain enough organic matter to eventually break down into LFG.[xiii] This system has associated capital, product, and O&M costs that must be offset by the revenue from tipping fees and product profits in order to be considered economically feasible.

Landfill Renewable Natural Gas

Approximately 13 percent of landfills with LFG capture systems treat LFG until it is of comparable quality to Approximately 13 percent of landfills with LFG capture systems treat LFG until it is of comparable quality to fossil natural gas. This process consists of removing CO_2 and other impurities from the captured LFG. The resulting renewable natural gas (RNG) can be injected into the natural gas pipeline system or used as a transportation fuel in the form of compressed or liquefied natural gas, CNG or LNG, respectively. Profits originate from tipping fees, product profits, and government incentives. One advantage to this method includes the direct creation of an estimated 15.7 jobs, and the indirect creation of approximately 45 to 55 jobs that are related to the construction and operation of landfill CNG.[xiv]

Landfill CNG facilities may increase profitability from a Low Carbon Fuel Standards (LCFS) program by earning credits for producing fuel with a lower carbon standard (provided there is a market for landfill CNG). Though Governor Pritzker proposed a Midwestern LCFS in 2020, it is not in operation as of 2021. Two factors that impact a landfill CNG system's cost-profit ratios are sensitivity to changes in methane potential and its efficiency of the gas disposal system. Additionally, government incentives may experience fluctuations in demand-based prices. Similar to other landfill gas pathways, this is a stop-gap solution to solve the larger issue of waste reduction and diversion.

Landfill Combined Heat & Power

In the U.S., approximately 17 percent of landfills with ongoing LFG-to-energy practices directly use LFG via CHP systems.[xv] The heat produced from the LFG-to-energy process can create a more energy-efficient facility in addition to heating local businesses via pipeline (within approximately 5 miles from the landfill). The costs and revenues associated with this pathway are sensitive to change and may not always be profitable. The product capital cost for nonresidential food waste is significant and makes this option less feasible than residential or total food waste.

Strengths, Weaknesses, Opportunities, & Threats

Strengths

The Federal Clean Air Act (CAA) specifies that landfills over a certain size must have gas collection systems in place to reduce air pollution. Since these gas collection systems are already in place, the first step of LFG-to-energy is fulfilled. The utilization of LFG collection as an energy source can provide several benefits for landfills and the community. Among government incentives, RIN credits for the RFS program can be earned, traded, and sold for profit.[xvi] WTE processes may provide additional revenue streams to landfills and reduce operating costs. LFG-to-energy has many applications. The generated heat can be used directly, electricity can be used on-site, sold to the grid or power electric vehicles, and transportation fuels can power natural gas vehicles. Participating residents may also experience lower energy costs. Additionally, LFG capture systems can economically benefit the local community through job creation (via construction and facility operations). LFG-powered energy also benefits the local environment through better air quality, reduced methane emissions, and providing an alternative option to fossil fuels.[xvii] From a global perspective, this method positively impacts climate change efforts, as it reduces GHG emissions in the atmosphere.

Weaknesses

While landfill gas capture reduces harmful methane emissions, it is less effective for energy generation compared to other WTE methods that take multiple material types, such as combustion. This is attributed to the fact that LFG capture only yields energy from the biodegradable materials in a landfill. Like many WTE options, landfill gas capture is also dependent on waste streams entering the landfill. A constant stream of waste is needed to sustain energy generation, and it is important that the waste contains enough organic matter, as non-organic waste will not contribute to LFG energy generation.[xviii]

LFG capture systems of energy generation are dependent on the mass disposal of waste. Limited landfill capacity also presents an issue. It may not be feasible for a landfill approaching the end of its life expectancy to install WTE processing systems.

Landfill Gas Capture System Component in Winnebago County

Issues regarding land use for waste management systems may also pose a potential weakness as landfills often garner unfavorable public opinions from local residents.

Cost to install and operate WTE systems can pose a threat to economic feasibility. For example, the capital costs of processing equipment for landfill RNG projects are approximately $6,200 to $8,300 per cubic foot per minute. Operation and maintenance (O&M) costs vary on facility size, but can range from $1.4 million to $7.4 million annually. The nature of increasingly limited landfill capacity makes this method only feasible as an adaptation strategy for sunsetting traditional waste infrastructure.

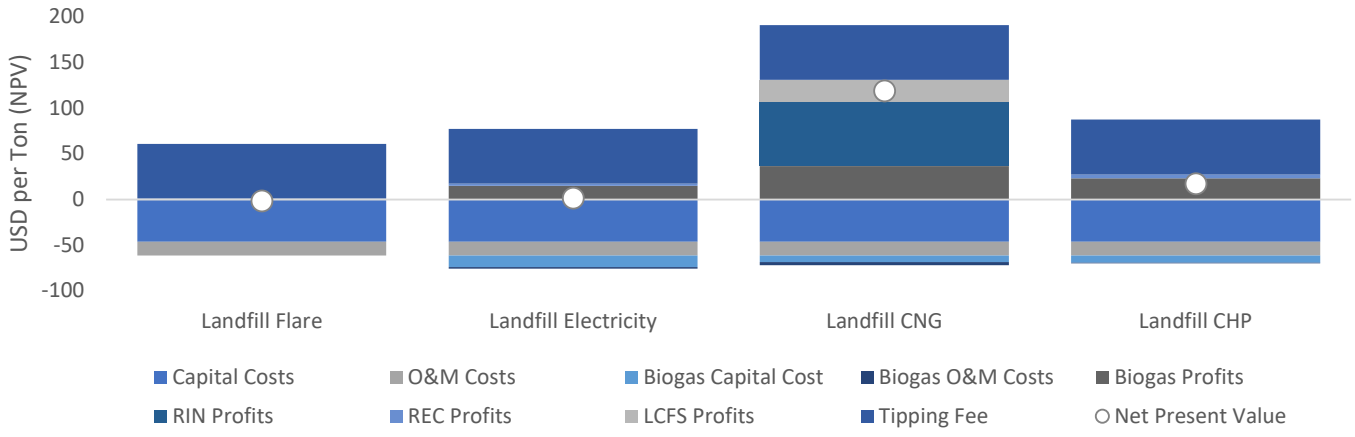
Opportunities

The feasibility of LFG energy production will vary depending on the methods of LFG collection and use, all of which have different operating and maintenance costs associated with them. This is heavily influenced by the efficiency of the gas capture system, which is estimated to have an average rate of efficiency of 75 percent but may range from 50 to 95 percent.[xix] Many landfills, including Winnebago Landfill, already have an existing gas capture system due to their size, which presents an opportunity to build upon existing infrastructure.

Threats

In order to capture LFG to generate energy, a facility must undergo several changes. The installation of new equipment and training of additional staff comes at a significant financial cost, making this goal unattainable to some landfills. In the past, environmental groups have voiced concerns about whether or not this system will effectively reduce GHG emissions, along with concerns of possible methane leaks to the atmosphere. Moreover, an energy system reliant on mass disposal rates is, by principle, unsustainable and undermines the importance of waste diversion.[xx] Safe system operations range from medium to high complexity, warranting rigorous staff training to ensure success and avoid negative environmental impacts.

Figure A-2. Cost-Benefit Comparison of LFG Pathways (Total Food Waste)



Source: National Renewable Energy Laboratory

Anaerobic Digestion

Anaerobic digestion (AD) is the chemical breakdown of organic materials by microorganisms in an anaerobic environment.[xxi] In an oxygen-absent environment, microorganisms undergo a chemical reaction to produce biogas. This gas is mostly composed of methane and CO_2, with small quantities of other gases. The generated biogas is stored in a tank, and depending on the end use of the gas, it may be upgraded through treatment. During treatment, CO_2 and other imperfections in the biogas can be removed, leaving only methane. Similar to LFG capture systems, excess biogas can be flared and converted from methane to CO_2. Due to the nature of its production, biogas is considered to be a renewable resource. It can be utilized as a direct source of energy or it can be treated further to be used for other purposes. Biogas produces energy that can be used for electricity, heat, and to power machines. With further treatment, it can be converted to fuel or transported in natural gas pipelines. This process also yields a byproduct called digestate. This wet, nutrient-rich substance can be separated out into liquid and solid states for a variety of purposes. The resulting product can be profitably sold to produce fertilizer, soil amendments, animal bedding, and more. The two main characterizations of feedstock or inputs for AD are wet and dry. For AD to be considered a dry system, the composition of the feedstock must be greater than 15 percent solids.[xxii] For the purposes of this report, only dry AD will be analyzed, as wet AD is not economically feasible under the assumed given conditions.

Dry Anaerobic Digestion Electricity

AD harnesses biogas which can be converted to energy by utilizing combustion engines, gas turbines, and fuel cells.[xxiii] This energy can be utilized onsite by the facility to power operations, or sold to businesses and industry for profit. Revenue is generated through tipping fees, digestate sales, and product profits. This method has associated costs in the form of capital, product, and O&M costs. These costs may not be fully offset by system revenue, as associated product costs may not allow for a net profit.

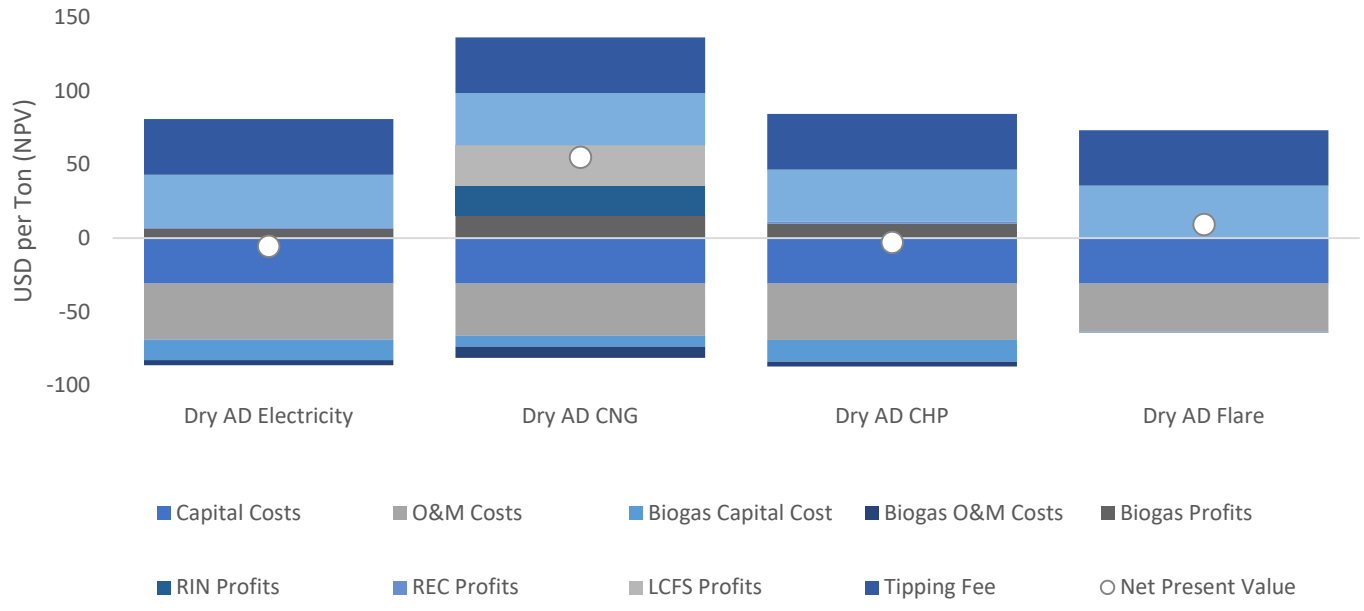
Dry Anaerobic Digestion Renewable Natural Gas

Biogas produced from AD can be treated to yield RNG. This is accomplished by removing imperfections from the gas such as water vapor, CO_2, hydrogen sulfide and other impurities. RNG quality is comparable to natural gas and can be injected into natural gas pipelines or used to create fuel alternatives in the form of compressed natural gas (CNG). AD that produces CNG has the highest profit potential in comparison to other listed AD methods. This process has capital and O&M costs associated with it, but these are likely to be offset by the revenue potential. There are also costs associated specifically with the WTE systems at the facility. This includes product capital cost and product O&M costs. Revenue is derived from tipping fees, digestate sales, product profit, and government incentives. Production of RNG is incentivized with government programs such as RFS to generate RINs, which are credits that can be traded and sold. LCFS are utilized in some areas, such as California, and have been proposed for the Midwest region as well.

Dry Anaerobic Digestion Combined Heat & Power

The biogas generated by AD can be burned to produce heat for the facility and surrounding areas. The biogas can also be converted to energy for CHP use. This can reduce energy costs of local businesses and industry since CHP produced can power heating and combustion equipment. The revenue collected from this process originates from tipping fees, sale of compost products, and product profits. Associated costs include capital, product, and O&M for the AD facility to function.

Figure A-3. Cost-Benefit Comparison of All Anaerobic Digestion Pathways (Total Food Waste)



Source: National Renewable Energy Laboratory

Strengths, Weaknesses, Opportunities, & Threats

Strengths

AD diverts organic waste (e.g. food waste, animal manure, sewage sludge, organic industry residuals) from landfills while simultaneously producing two useful, profitable materials: biogas and digestate. Organic fats, oils, greases, and paper are also accepted, but some facilities may deny disposal if the batch contains more than 30 percent paper products.[xxiv] This process provides a renewable source of energy that reduces the reliance on less sustainable energy sources, such as fossil fuels. AD has the potential to be a supplemental technology fulfilling local, sustainable energy resilience goals. After initial setup, AD can produce its own energy needed to power the process. The use of digestate as a natural fertilizer also reduces the amount of synthetic fertilizer used and produced.[xxv] In addition to the two revenue streams provided by the sale of biogas and digestate, AD systems that produce RNG can make additional profit in the form of government incentive programs such as RFS (via RINs) and LCFS.

This process also benefits local communities by creating jobs through the construction and operation of AD facilities. Local industry and businesses may experience financial benefits from close proximity to an AD facility in the form of energy and heat generation savings. Additionally, AD uses far less land area at three to six acres, compared to traditional waste management.

Weaknesses

While AD has the potential to be a viable, profitable WTE option, certain factors may inhibit the efficiency of the process. One weakness to note is that source separation of MSW must take place prior to digestion. Materials such as wood, plastic, metal, glass, sand, bone waste, soil, and contaminants must be removed to the greatest degree possible. Failure to separate out these materials may result in complications with the anaerobic digesters, ranging from clogs and contamination to decreased efficiency. The risk of contamination is also present when producing biogas and digestate. If there is contamination in the feedstock, the resulting products risk contamination as well. Regular monitoring of pH levels and substances (such as nitrogen, methane, volatile fatty acids, ammonia, etc.) is conducted to ensure these contaminants are identified. Ammonia and hydrogen sulfide contaminants can impact the efficiency of biogas generation and can cause damage to equipment. Contaminated digestate beyond feasible treatment must be landfilled.

Opportunities

As the U.S. continues to produce high quantities of organic waste and looks for sustainable energy alternatives, there are opportunities for a growth in AD facilities. As of 2019, t209 AD facilities operate across the United States. After observing local waste streams, there are further diversion opportunities for organics. For example, food waste is a significant, growing portion of the local waste stream. There is also a significant agricultural industry in both Boone and Winnebago Counties, making animal and yard waste another contributing asset to this method. Furthermore, potential opportunities exist for partnerships with local hospitals and universities to utilize the large quantities of food produced for AD purposes.

Threats

Emissions are produced throughout the AD process. Both the transportation of waste to an AD facility and the transport of digestate to its destination emit CO_2. During the curing stage, methane and nitrous oxide emissions may be released, and biogas leaks are possible. Land application of digestate also contributes to nitrous oxide emissions, which can have an adverse environmental effect if not offset by the reduced emissions in the other steps of the process.[xxvi] Additionally, increased community traffic and odor concerns may be a point of controversy for location and general public support.

Composting

Composting is the process of combining organic materials to create a homogenous fertilizer.[xxvii] More specifically, aerobic composting is a biological process in an open-air environment where microorganisms break down biodegradable material in the presence of oxygen.[xxviii] Compost material is made from a mixture of organic waste that can feed soil to support plant growth. Compost consists of three components: equal parts browns (dead leaves, branches, etc.) and greens (grass clippings, vegetable waste, fruit scraps, coffee grounds, etc.), with some water. Financial and economic considerations involved in composting include capital costs, O&M costs, compost product, jobs created, and tipping fees as profits. The following sections discuss three different composting methods.

Windrow Composting

Windrow composting involves creating rows of organic waste and aerating the material by turning the piles. This type of composting is designed for larger volumes of waste collected on a community scale at minimum. Commonly utilized materials are yard trimmings, grease, liquids, and animal byproducts.[xxix] This method requires a considerable amount of land, labor, and careful monitoring for effective waste ratios and methods. O&M and tipping fees have the largest influence on NPV. Windrow composting is less costly for residential waste in comparison to nonresidential waste. While this method ranks second in profitability among the other two composting methods, the process requires a significant amount of land (15-20 acres) and tends to emit powerful odors, greatly reducing the feasibility of implementing.

Aerated Static Piles (ASP) Composting

ASP composting is when organic waste is mixed in a large pile with bulking agents, such as shredded newspaper, layered in between the organic material to allow air flow. This layering helps the material break down evenly. ASP composting can also be conducted over a network of pipes that circulate air through the organic material. It has the highest NPV when incorporating all food waste (residential and nonresidential). O&M costs are the largest expenses associated with ASP composting. These can be offset with appropriate tipping fees, which has the largest impact on profits. This method requires a significant amount of staffing, making labor rates a significant cost driver. From an economic perspective, ASP composting has the highest profitability potential in comparison to windrow and in-vessel composting methods. Odor control is possible with this process, but it requires about six to eight acres of land.

Further information regarding land capacity and siting within Boone and Winnebago Counties must be obtained in order to determine if this is a feasible WTE method.

In-Vessel Composting

In-vessel composting involves placing organic material into a large container (or vessel) and turning it mechanically. This composting method has the advantage of being very adjustable in scale. Containers can range in size and consequently setting. While this method is versatile and produces minimal odor, it can be costly and requires experienced management. O&M for this method is costlier in comparison to the other two methods. While this method is less profitable, it requires a smaller amount of land (three to six acres) and does not present an odor control issue. This addresses both land capacity issues and community concerns.

Strengths, Weaknesses, Opportunities, & Threats

Strengths

Composting is versatile and has the advantage of scalability, so regions with varying population density can participate. This method also provides a low barrier for participation: Residential composting with appropriate labeling is fairly straightforward. Not only does composting reduce waste and result in negative net GHG emissions, it also produces cheaper, organic fertilizer as compared to chemical fertilizers. Composting enhances soil quality and structure, supports sustainable farming practices, produces higher crop yields, provides odor control, generates revenue, and suppresses plant diseases and pests. This method generally requires lower levels of training to run and manage and less land in comparison to traditional waste management practices. Composting may address multiple concerns traditional waste management cannot, such as odor control, GHG emissions, fossil fuel energy use, and finite land capacity.

Weaknesses

Though composting can address many regional waste management concerns, every option has challenges. Waste streams can fluctuate by season and other local factors. Beyond that, there are no current residential or commercial options for food waste collection. More data is needed to determine the composition of all waste within the two counties.

In the absence of proper maintenance, compost products may attract wildlife, become a fire hazard, and emit unpleasant odors.[xxx] Finally, while energy input is required to create the compost product, it cannot supply energy in the way other organic waste utilization methods. These weaknesses could potentially be mitigated when paired with other renewable options (i.e. solar, wind) could sustainably supplement the energy needed. Additionally, stringent policy, monitoring, and appropriate operating procedures are preventative strategies to address these weaknesses.

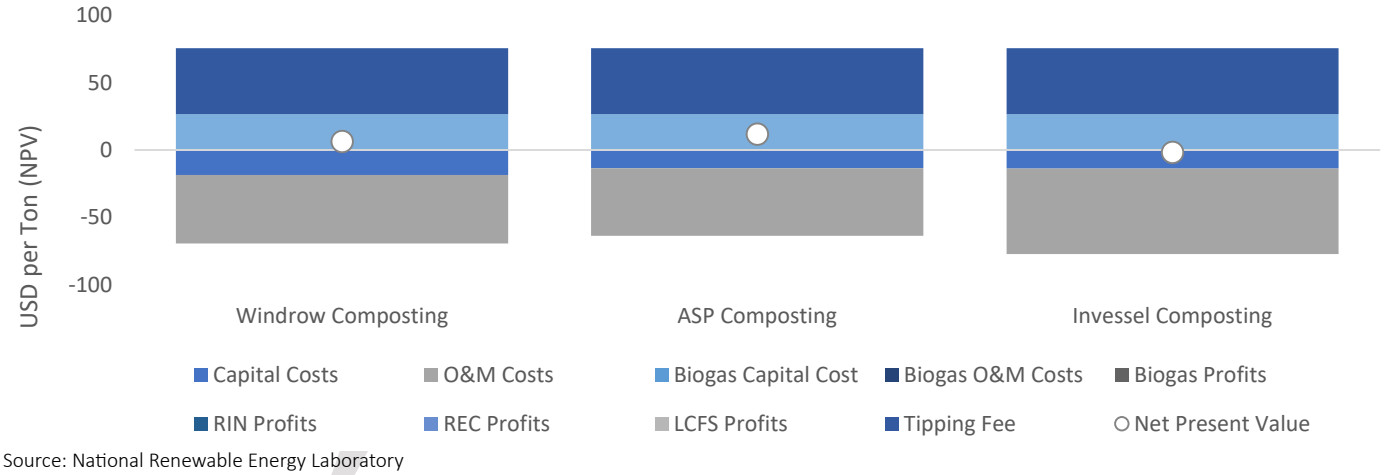
Opportunities

The main application of compost is to support soil and plant growth. There are many potential opportunities to incorporate both residential and commercial composting into the Northern Illinois region. Within Boone and Winnebago Counties, some municipalities allow community members to participate in a yard waste collection program or drop offs. There are virtually no options for food waste diversion as of 2022, yet there is a large volume of food waste (see Figure A-5). Food waste is a prominent, growing category in local waste streams, illustrating a need for material source reduction and diversion. The scalable nature of composting provides an opportunity to address the needs of the diverse communities within Boone and Winnebago Counties. The area's limited composting infrastructure offers a pathway to larger scale collaboration efforts and potential cost savings through information sharing and exploring renewable energy incentives.

Threats

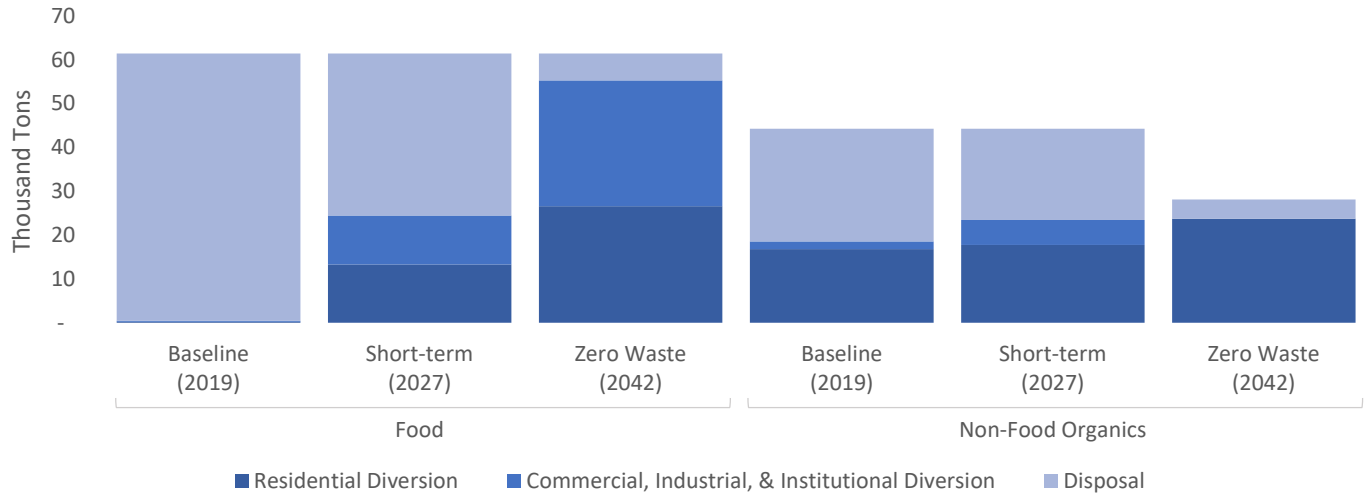
There are a variety of threats related to the effectiveness of composting as a WTE method. Currently, there are no incentives or penalties for both consumers and the commercial sector to separate organics from other waste materials. Composting is not a part of the local waste management system at this time; therefore, funding and capacity remain key barriers in enabling this method. Stricter regulation on contaminants in composting could also compromise method effectiveness and profitability. Reductions in food waste could lead to less input availability to achieve economies of scale in compost operations. Since waste from surrounding areas are disposed of at the Winnebago Landfill, this may not be an issue. Any new waste management facility will raise concerns regarding things like location and increased community traffic, potentially affecting public support.

Figure A-4. Cost-Benefit Comparison of All Composting Food Utilization Pathways (Total Food Waste)



Source: National Renewable Energy Laboratory

Figure A-5. Diversion Rate Breakdowns of Organics in Boone & Winnebago Counties



Source: Ning Ai, PhD- UIC 2021

Other Waste to Energy Options

Gasification, pyrolysis, and combustion are other WTE methods not considered in this report. This report examines primarily organic waste utilization options.

Gasification

Gasification is a WTE process that converts specific waste types that contain carbon (i.e. coal, petroleum, plastics, biomass) into synthesis gas, ethanol, and hydrogen.[xxxi] Syngas can be converted to diesel, jet fuel, electricity, and steam. These products are derived from MSW. While this method utilizes organic material, it also releases more intensive GHG emissions compared to other methods.

Pyrolysis

This WTE process converts plastic waste or biomass into fuel by heating material at very high temperatures in an oxygen free environment.[xxxii] The result is a liquid oil commonly known as "bio" or "pyrolysis" oil. Bio oil is very acidic and corrosive, which makes the material costly and challenging to transport. Equipment and infrastructure handling the crude oil also have shorter life spans.[xxxiii] This method contributes to air pollution with carbon-intense emissions from burning at a comparable level to traditional combustion. The impact on air quality varies, as it is dependent on material separation and composition. Pyrolysis is not as energy efficient compared to other WTE methods: 20 to 30 percent of burned material by weight results in fly ash, which is typically landfilled but may be reused.[xxxiv] These facilities still divert a significant amount of waste while existing as a revenue generation source. For example, the WTE facility in Lee County, Florida diverted approximately 58 to 75 percent of waste on a quarterly basis between 2016 and 2022.[xxxv] Limited regulatory and monitoring capacity is a barrier, as these facilities must be carefully monitored to mitigate public health, environmental, and safety risks.

Combustion

The historical WTE method of municipal solid waste (MSW) combustion for heat and electricity generation is less common today with emerging technology alternatives and the push toward waste reduction. Public perception remains wary of this method.

Early iterations of combustion technology caused public health concerns and negative environmental impacts via emissions, however combustion technology has significantly advanced since.[xxxvi] One demonstration of this progress is Palm Beach's Renewable Energy Facility No. Two. In 2020, the facility diverted 194,229 garbage trucks of waste from landfills.[xxxvii] The facility is produces fewer emissions compared to other sources within the County, falling 31 to 99 percent below federal standards. Though burning MSW does not address the volume of waste produced, it can provide a solution for the current waste volumes produced as communities move toward waste reduction practices.

Conclusion & Recommendations

WTE and waste utilization opportunities for Boone and Winnebago Counties involve adapting existing, traditional waste infrastructure to explore AD and composting methods. All of the methods detailed in this report have impacts that should be weighed against their benefits. Concerns regarding environmental impacts, waste origins, facility location, limited landfill capacity, odor control, and energy resilience were taken into account in order to appropriately address local needs. This criteria should continually be evaluated in further pursuit of these options.

Recommendations

Based on current policy, incentives and regulations, NREL analysis, local feedback, and waste composition projections, the following recommendations should be explored further.

1. Increase Knowledge of Local Waste Stream Compositions

More data on waste that Boone and Winnebago Counties produce and import is essential to accurately evaluating appropriate WTE options, as specific volumes of waste are necessary for sufficient energy output. Enacting or enforcing ordinances that require data hauler reporting can assist with these efforts. Additionally, conducting waste audits can be useful in gathering more data on local waste stream composition.

Waste stream compositions also change depending on the season and other external factors, making data beyond projections or audits necessary for further informed evaluation.

2. Adapt Landfill Infrastructure for Landfill Gas Capture

Winnebago Landfill has an estimated 16 years of capacity left. The site currently has an existing gas collection system, which is a necessary infrastructure component for the WTE method of LGC and moves it one step closer to implementation. The State of Illinois' REC program specifies fuel from landfill gas as a renewable energy and the EPA's RFS Program offers an additional opportunity for WTE regarding landfill infrastructure. Resulting profits from these programs may be used to further waste diversion efforts, launch new community health initiatives, or offset previous adverse impacts from waste management practices in the surrounding community. Examples of this include funding trash clean ups, additional studies on the impact of waste in the region, and implementing better waste management and diversion technology.

3. Conduct Further Anaerobic Digestion Siting & Feasibility Analysis

The AD process can address community concerns that traditional waste management currently does not, specifically pertaining to odor control and negative environmental impacts. This method yields negative net GHG emissions, diverts waste, uses less land in comparison to a landfill, and the process is self-sustaining in regards to feedstock. Additionally, federal and state policies can provide funding for local governments and companies to leverage. Large organic waste producers, such as schools, hospitals, golf courses, and manufacturers may benefit from AD programs. Permits are not required for self-contained sites with unaltered organic waste products, with the added benefits of reduced waste disposal costs, a smaller emissions impact, and the financial leverage profits from RIN credits offer. Based on these benefits and potential impacts, it is recommended that further siting and feasibility analyses be completed in order to determine whether AD could support WTE efforts in the region.

4. Conduct Further Composting Siting & Feasibility Analysis

As noted by local residents through public engagement efforts, traditional landfills can cause several issues, including odor. In an effort to mitigate further odor nuisances, only in-vessel and ASP composting should be explored, as significant odors are associated with windrow composting. Composting yields negative net GHG emissions, allows for economies of scale with proper organic waste utilization, and has a relatively low barrier to training for operation. This method does require energy input for operation and therefore does not address future energy resilience needs. Based on these benefits and potential impacts, it is recommended that further siting and feasibility analyses be completed in order to determine whether composting could support organic waste utilization efforts in the region. Additionally, the presence of a Commercial Food Digester on commercial sites (large food waste producers) should be explored to divert organic waste. Sites that choose not to have Commercial Food Digesters could pay an extra tipping fee that helps fund future waste reduction efforts or address current or prevent negative environmental impacts related to waste.

5. Gather Information from Best Practice Communities

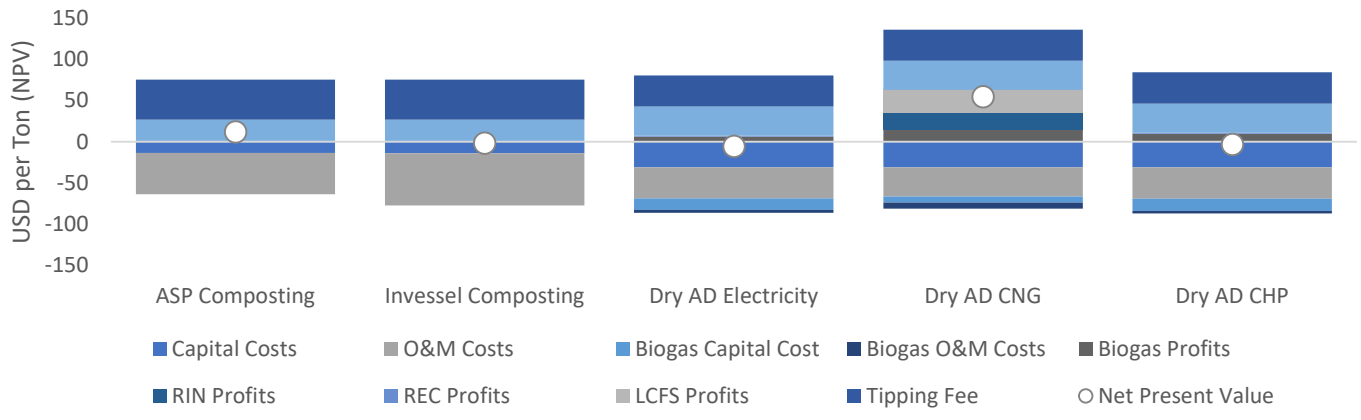
The waste-related needs and issues discussed in this report are not unique to Northern Illinois. The following best practice communities should be contacted for additional insight and knowledge on how implementing WTE technology and waste utilization methods address concerns such as odor, energy resilience, negative environmental impacts, and funding.

Example Communities

Ogle County, Illinois

Ogle County has made significant progress in recent years regarding waste education, reduction, and programming. Due to proximity, Ogle County may have similar barriers, funding, and partnership opportunities to explore. Additionally, the Orchard Hills Landfill, in Northeast Ogle County, addresses material diversion utilizing WTE technology via the Orchard Hills Generating Station.[xxxviii] Organic material decomposes in landfill cells and collection systems capture the resulting methane (CH_4), directing the energy eventually to the energy grid.

Figure A-6. Cost-Benefit Comparison of In-vessel Composting, ASP Composting, Dry AD (Total Food Waste)



Source: National Renewable Energy Laboratory

The facility also produces preprinted manifests (forms detailing waste types, quantities, handling instructions and involved party signatures) and computerized waste tracking for all disposed waste.

Boulder County, Colorado

Green Star Schools Program

This program is run through Eco-Cycle, a non-profit that provides environmental education and curbside collection.[xxxix] Green Star Schools and other educational Eco-Cycle programs are funded by local government, a school district, and multiple grant sources. This program is relevant to food waste reduction efforts, and represents a successful model in a comparable public school district size.

Richmond, California

Free Residential Recycling & Composting

All Richmond residents are eligible for free weekly recycling and composting services.[xl] The City of Richmond exclusively works with Republic Services, and many aspects of this model, including price exceedances, are enforced via local ordinance.[xli] This is relevant to see low to no costs in the context of private waste management.

Austin, Texas

Zero Waste Event Rebate

The City of Austin offers a rebate as an incentive for organizers to reduce waste at their events.[xlii] Event organizers can receive rebates of up to $750. Applicants must convey that waste collection exceeds minimum requirements, and the event must be outdoors, public, within city limits, in compliance with local ordinances, and with a minimum attendance of 500 people. Rebates can be used for waste collection, equipment, or labor related to composting. This is relevant to larger community events in Northern Illinois with similar attendance. xxxvii palm beach

Appendix B: Proposed Implementation Tactics & Timelines

Waste Programming Until 2042

Boone and Winnebago Counties will continue to utilize the Winnebago Landfill and the current systems that locally manage waste disposal. The counties will continue to pursue alternative waste disposal methods and implement them as the landfill reaches capacity.

Other Potential Programs Planned to Handle Waste Until 2042

Program 1: Evaluating the Expansion of Existing Collection Efforts and Coordinated Food Scrap Collection Program

Both counties and relevant stakeholders will evaluate the potential of a food scrap collection in coordination with existing waste services to reduce and utilize food waste. Food scraps may be transported to local gardens and farms, edible food may be diverted to local food pantries and other supportive services.

Environmental, Energy, and Life Cycle Costs

Diverting organics would result in reduced GHG emissions at the local landfill. Refer to Appendix A for more information regarding these costs.

Economic Impacts

The local economic impacts of food scrap collection are complex, requiring further analysis. Implementing this program would create local employment opportunities, generating renewable energy and putting cost savings back into local residences and businesses.

Program 2: Planning for Increased Educational Efforts

Boone and Winnebago Counties will evaluate various methods for public outreach and education, collaborating with local government, schools, residents, and large waste generators to educate the public on their options, increasing awareness and intergovernmental collaboration.

Environmental, Energy, and Life Cycle Costs

The result of increased education regarding waste diversion may result in reduced confusion surrounding recycling and therefore more effective individual sorting outcomes, shown in the survey detailed in Appendix E. In a 2014 survey conducted by the Institute of Scrap Recycling Industries and Earth 911, 65 percent of respondents stated they do not understand what plastics are acceptable in curbside collection.[i]

Many recyclers easily mistake the Resin Identification Number (RIN) as a recycling symbol. This number identifies the type of polymer, not necessarily their ability to be recycled. The range of polymers able to be recycled depend on a variety of factors, such as the hauler and inventory of waste disposal infrastructure. Educating various stakeholders on how, what and where to recycle, in addition to process transparency, may assist in increased participation and subsequent diversion rates.

Economic Impacts

The general economic impacts of increased educational efforts include reduced machine repair and maintenance, the potential creation of jobs regarding the formation and distribution of educational materials, and potential program expansions.

Program 3: Exploration of an Organics Compost or Processing Facility

Constructing an organics compost facility will allow for food waste and other organic material diversion. The National Renewable Energy Laboratory (NREL) provided technical assistance to evaluate various impacts of several waste utilization methods. Boone and Winnebago Counties will further explore establishing a waste utilization facility based upon the findings in Appendix A: A Report on Waste-to-Energy & Waste Utilization Options in the Rockford Region. An exploration of environmental and economic impacts can also be found in Appendix A. Next steps include further identifying the scale of the facility, location and mechanisms of implementation.

Potential Facility Locations

The two counties are exploring the feasibility of optimal facility types for the future of waste disposal as the Winnebago Landfill reaches capacity. Materials recovery facilities, drop-off facilities, compost facilities, waste utilization facilities, and metal scrapyards are all options under current consideration. The area under consideration is west of Interstate 39 between Rockford International Airport and the Winnebago County line.

Table B-1. Funding Scale

Funding Scale	This funding scale is subject to the scope of each specific action.
$	$0- $20,000
$$	$20,000- $100,000.
$$$	$100,000 +

Table B-2. Public Education & Outreach

Goal 1	Educate the public on waste diversion practices, program information and local waste systems to increase participation in waste diversion efforts.
Rec. 1	Design and implement community-focused adult and youth solid waste management educational programming and workshops using IEPA and other relevant resources.

#	Action	Responsible Parties	Support	Funding	Timeline
1.1A	Review existing toolkits to identify framework and general topics.	Boone County, Winnebago County	Region 1 Planning Council	$	5 Years
1.1B	Identify community partners to host and gather residents for these workshops.	Boone County, Winnebago County	Region 1 Planning Council, Community Leaders, Public Library	$	5 Years
1.1C	Identify funding mechanisms and sources to support educational programming efforts.	Boone County, Winnebago County	Region 1 Planning Council	$$	5 Years
1.1D	Promote backyard composting programs with subsidized compost bin sales/workshops.	Boone County, Winnebago County	Commercial Composters	$$	5 Years
Rec. 2	Explore, produce, and standardize informative signage for waste and recycling bins within Boone and Winnebago Counties.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.2A	Explore benefits and examples of standardized signage in the context of local waste infrastructure (standard informational stickers for bins, standardizing the bin itself, etc.)	Winnebago County	Boone County, Waste haulers, Landfill and Recycling Facilities	$$	5 Year
1.2B	Review and assess large residential bin management strategies, programs, and costs.	Winnebago County	Boone County	$$	5 Year
1.2C	Form a strategic approach to standardizing signage across counties.	Winnebago County	Boone County, Region 1 Planning Council, Waste haulers, Landfill and Recycling Facilities	$$	5 Year
Rec. 3	Create, distribute, and regularly update solid waste educational information for Boone and Winnebago Counties' websites.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.3A	Review existing website examples and templates.	Boone County, Winnebago County	Region 1 Planning Council	$	1 Year
1.3B	Compile and post information on disposal-related resources in the area, links to the Solid Waste Management Plans, and additional tools.	Boone County, Winnebago County	Area partners	$	1 Year
1.3C	Promote youth research projects and contests on creative ways to divert or reduce food waste, textiles, and plastics.	Winnebago County	Region 1 Planning Council	$$	Ongoing
1.3D	Work with clothing donation centers to encourage criteria for clothing/ textile donation.	Boone County, Winnebago County	Region 1 Planning Council	$$	Ongoing
Goal 2	Engage regularly with area residents, business owners and community leaders regarding local solid waste issues, targeted materials, needs and opportunities.				
Rec. 1	Create a low barrier participation citizen engagement committee (CEC) to connect with communities on a regional scale.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Review and identify where a CEC could be housed in the Counties or in collaboration with Region 1 Planning Council.	Boone County, Winnebago County	Region 1 Planning Council, Area Partners	$	1 Year
2.1B	Identify areas of needed representation and roles.	Boone County, Winnebago County	Area partners, general public	$	1 Year
2.1C	Identify who will potentially lead this committee, discuss goals, framework, and expectations.	Winnebago County	Boone County	$$	1 Year
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1D	Conduct periodic community surveys to understand waste-related community perceptions and educational impacts.	CEC	Region 1 Planning Council	$$	Ongoing
2.1 E	Identify the largest waste generators in commercial, industrial, and institutional sectors and their contacts.	Winnebago County	Boone County	$	1 Year

Rec. 2	Educate high-volume waste producers in the area regarding waste diversion.

#	Action	Responsible Parties	Support	Funding	Timeline
2.2A	Identify the largest waste generators in commercial, industrial and institutional sectors and their contacts	Winnebago County	Public institutions, community groups & partners	$	5 Year
2.2B	Educate large food waste generators on food waste diversion and encourage innovative ways to reduce their waste.	Winnebago County	Educational non-profits, public institutions	$$	5 Year/ Ongoing

Rec. 3	Celebrate, recognize, and uplift significant area achievements in waste reduction and environmental improvements.

#	Action	Responsible Parties	Support	Funding	Timeline
2.3A	Recognize communities within the County that champion waste reduction efforts.	Boone County, Winnebago County	Municipalities	$	5 Year

Table B-3. Circular Economy & GHG Emissions

Goal 1	Gain a local understanding of GHG emissions related to waste processing.
Rec. 1	Conduct a regional GHG inventory to understand emissions, impacts, and opportunities related to waste management.

#	Action	Responsible Parties	Support	Funding	Timeline
1.1A	Work regionally to establish and standardize how existing waste reporting mechanisms operate.	Boone County, Winnebago County	Region 1 Planning Council	$	1 year
1.1B	Work with municipalities throughout the Counties to understand area-specific information related to GHG emissions.	Region 1 Planning Council	Boone County, Winnebago County	$	5 years
1.1C	Utilize EPA's WARM Model to track GHG emissions reductions in relation to waste management and diversion efforts.	Region 1 Planning Council	Local government	$$	Ongoing

Rec. 2	Conduct studies on the feasibility of waste-related GHG emissions reductions options.

#	Action	Responsible Parties	Support	Funding	Timeline
1.2A	Examine existing related infrastructure and emissions produced/ reduced.	Winnebago County	Boone County	$$$	5 Years
1.2B	Identify and obtain funding sources for programs found necessary by the feasibility study.	Winnebago County	"Boone County, Region 1 Planning Council"	$$	1 year
1.2C	Support collaborative, mutually beneficial partnerships to reduce regional GHG emissions related to waste.	Region 1 Planning Council	Boone County, Winnebago County	$	Ongoing

Goal 2	Achieve a regional circular economy to reduce waste and increase economic development by 2040.
Rec. 1	Conduct economic impact and feasibility assessments to understand the local effects of a circular economy.

#	Action	Responsible Parties	Support	Funding	Timeline
2.1A	Ensure access to current market rates and applications for common solid waste materials. Cross reference local waste streams with advantageous prices and materials.	Boone County, Winnebago County	Region 1 Planning Council	$$	Ongoing
2.1B	Create a regional circular economy action plan to outline specific areas of need and opportunity.	Boone County, Winnebago County	Region 1 Planning Council	$$$	5 Years

Rec. 2	Connect stakeholders with eligible circular economy programs, opportunities, and incentives to reduce and/or divert waste.

#	Action	Responsible Parties	Support	Funding	Timeline
2.2A	Establish a circular economy workshop and program that includes partner agencies to establish & achieve plan goals at a local level.	Winnebago County	Region 1 Planning Council	$$	5 years
2.2B	Encourage an “ecology of commerce” for promoting the sale of reusable items through various efforts such as community swap events.	Boone County, Winnebago County	Local community partners	$	Ongoing
2.2C	Sponsor community repair workshops and educational programs for community members.	Winnebago County	Boone County	$$	5 years
2.2D	Develop (or use existing technology) and promote a waste diversion network of businesses and customers (repair/refurbishing businesses, used building material stores, non-profit organizations, deconstruction services, etc.).	Boone County, Winnebago County	Region 1 Planning Council	$$	Ongoing

Table B-4. System Organization & Administration

Goal 1	Bridge communication gaps between the public and waste haulers to address issues, needs, and opportunities.				
Rec. 1	Analyze and collaborate with private waste system components to standardize when possible.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1A	Work with private haulers to understand current waste management system issues and consumer feedback.	Boone County, Winnebago County	Local government	$	Ongoing
1.1B	Identify sources that currently update customers regarding waste management information.	Boone County, Winnebago County	Local government	$	5 years
Rec. 2	Offer waste, recycling, and composting options for all residents and resources for businesses.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.2A	Connect with neighboring counties to understand source reduction and waste diversion opportunities.	Boone County, Winnebago County	Region 1 Planning Council	$	1 year
1.2B	Review EPA toolkits on approaching different audiences with waste, recycling, and composting information.	Winnebago County, Boone County, Region 1 Planning Council	Local community partners	$	1 year
Goal 2	Integrate zero-waste strategies throughout the community where applicable.				
Rec. 1	Partner with companies to develop innovative zero waste programs.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Collaborate regionally to identify zero-waste program frameworks and standards.	Boone County, Winnebago County	Region 1 Planning Council	$$	5 Years
2.1B	Identify three pilot programs to implement to address targeted material reductions.	Winnebago County	Region 1 Planning Council	$$$	5 years
2.1C	Identify mutually beneficial waste diversion activities and opportunities across county jurisdictions.	Boone County, Winnebago County	Region 1 Planning Council	$	Ongoing
Rec. 2	Provide incentives for generators, waste haulers, recyclers, composters, and landfill operators to prioritize reducing and reusing materials, then recycling, digesting and composting the rest.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.2A	Create a recognition program for communities that set and meet key milestones.	Boone County, Winnebago County	Region 1 Planning Council	$$	5 years
2.2B	Establish recognition milestones, incentives, and monitoring practices.	Boone County, Winnebago County	Region 1 Planning Council	$	Ongoing
2.3C	Host a booth to offer educational resources for local businesses regarding source reduction/diversion at local events (e.g. City Market, Buchanan Street Strolls, County Fairs)	Boone County, Winnebago County	Local governments and community partners	$-$$	Ongoing

Table B-5. Partnerships

Goal 1	**Develop community partnerships to grow and integrate waste diversion services and events.**				
Rec. 1	**Increase awareness and establish regional community drop-off locations for recycling.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1A	Collaborate with local partners to host annual community collection events for difficult-to-recycle materials, such as e-waste and plastic bags.	Boone County, Winnebago County, Local community partners	Local government	$$	Ongoing
1.1B	Expand commercial recycling centers and increase awareness of their services through partner and community networks.	Winnebago County, Private commercial waste collection facilities	Local community partners	$$$	5 years
1.1C	Partner with local agencies on educational programs related to recycling and waste reduction tactics.	Local community partners	Local government	$	Ongoing
Goal 2	**Collaborate with neighboring counties to maximize resources and efforts through standardizing public messaging and educational materials.**				
Rec 1.	**Regularly meet with municipalities to explore and encourage multi-level government collaboration and share outreach materials.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Examine feasibility for waste exports and develop an agreement with surrounding counties for contingency plans.	Winnebago County	Boone County, Region 1 Planning Council	$$	1 year
2.1B	Explore and develop joint contracting/large scale agreements through cross-jurisdictional recycling at the county level.	Winnebago County	Boone County, Region 1 Planning Council	$$	1 year
2.1C	Partner with municipalities and housing advocates to provide educational information to property managers and renters.	Winnebago County	Boone County, Region 1 Planning Council	$$	Ongoing
2.1D	Create and uses Zero Waste Task Force to partner with local non-profits, private businesses, and residents when updating and implementing the Plan.	Winnebago County	Boone County, Region 1 Planning Council	$$	Ongoing
Goal 3	**Pursue Green Business Program partnerships to assist businesses with waste reduction and diversion.**				
Rec. 1	**Establish a local green business coalition to support waste reduction strategies.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
3.1A	Incentivize, educate, and encourage local businesses to participate in the Illinois Green Business Certification Program.	Boone County, Winnebago County	Region 1 Planning Council, Local chambers and economic development partners, Local government	$	Ongoing
3.2B	Partner with local restaurants, grocery stores and community charities to create a system of food waste diversion efforts, such as diverting edible food via donation.	Winnebago County	Boone County, Local community partners	$$	Ongoing
3.3C	Connect organizations like Food Not Bombs with entities that have excess food waste to increase diversion.	Winnebago County	Region 1 Planning Council, Food Not Bombs	$	Ongoing
2.1D	Create and uses Zero Waste Task Force to partner with local non-profits, private businesses, and residents when updating and implementing the Plan.	Winnebago County	Boone County, Region 1 Planning Council	$$	Ongoing
Rec. 2	**Utilize partnerships with licensed haulers, local governments, and other entities to maximize area capacity and create educational campaigns, programs, and events.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
3.2A	Require licensed haulers to post requirements on collection procedures and educate consumers on acceptable materials.	Winnebago County	Boone County	$$	Ongoing
3.2B	Educate community members on the negative impacts of single use items.	Boone County, Winnebago County	Region 1 Planning Council, Local community partners	$	Ongoing
3.2C	Engage the community on potential gaps in the waste management system that limit diversion.	Boone County, Winnebago County	Region 1 Planning Council, Local community partners	$	Ongoing

Table B-6. Policy

Goal 1	**Increase transparency of waste management legislation and efforts.**				
Rec. 1	**Establish local policies and processes to support consistent record keeping, data collection, monitoring, and reporting for solid waste generation and diversion.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1A	Require and collect annual hauler reports detailing waste and recycling characterization and tonnages by county/sector to ensure proper collection and infrastructure management, and to assist with plan updates.	Boone County, Winnebago County	Local governments, Waste haulers	$$	5 years
1.1B	Require reports to be shared publicly via media advisories and accessible on websites to ensure transparency and increase awareness.	Winnebago County	Boone County, Local government	$$	5 years
1.1C	Assess local policy related to waste for system gaps and needs on a periodic basis.	Boone County, Winnebago County	Local government, Region 1 Planning Council	$	Ongoing
1.1D	Analyze local ordinances and compile proposed revisions and additions that support overarching waste reduction goals.	Region 1 Planning Council	Boone County, Winnebago County	$$	5 Years
Goal 2	**Establish local policies that lower barriers and increase access to source reduction and waste diversion efforts.**				
Rec. 1	**Require licensed haulers to provide recycling collection data on all residential and commercial accounts.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Explore how local policy can specifically address and increase recycling options and participation.	Winnebago County	Boone County, Local government	$$	5 years
2.1B	Explore the feasibility of requiring licensed haulers to provide compost containers, collection/diversion procedures, and the costs said changes would incur.	Boone County, Winnebago County	Region 1 Planning Council, Waste haulers	$$	Ongoing
Rec. 2	**Require residential (rentals and owned) and commercial participation in source reduction and waste diversion efforts.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.2A	Require property owners to provide source separated, single-stream recycling options for renters.	Winnebago County	Boone County, Local government	$	5 years
2.2B	Explore Pay-As-You-Throw (PAYT) requirements for source reduction/ diversion practices.	Winnebago County	Boone County, Local government	$	5 years
2.2C	Assess barriers for low/fixed income households regarding diversion methods (e.g. recycling, compost bins).	Winnebago County	Boone County, Local government	$$	5 years
2.2D	Facilitate open floor discussions or town halls with community members regarding source reduction and waste diversion requirements.	Boone County, Winnebago County	Region 1 Planning Council	$	Ongoing
Rec. 3	**Support local government bans or fees to reduce the number of single use plastic bags within the next 10 years.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.3A	Explore the local impacts and feasibility of introducing a plastic bag fee or ban.	Winnebago County	Boone County, Region 1 Planning Council	$$	10 years
2.3B	Require in-store bag recycling programs and availability of reusable bags for purchase at groceries and pharmacies.	Winnebago County	Boone County, Local government	$	5 years
Goal 3	**Incentivize waste-related GHG emissions reductions and the use of emerging technologies through local policy.**				
Rec. 1	**Evaluate and consider alternative technologies, taxes, and subsidies for materials management.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
3.1A	Advocate for appropriate State legislation to allow nonhome rule municipalities and counties in Northern Illinois to implement strategies to offset emissions by 2027.	Elected officials, NorthCOG	Local government	$$	5 years
3.1B	Conduct feasibility studies regarding new waste diversion technology and to analyze costs and benefits in a local context.	Boone County, Winnebago County	Region 1 Planning Council	$	Ongoing
3.1C	Explore supporting policy for direct subsidies and/or tax credits for source reduction by 2032.	Winnebago County	Boone County, Region 1 Planning Council	$$	10 years
3.1D	Explore methods and strategies which may offset carbon emissions.	Elected officials, NorthCOG	Region 1 Planning Council	$	Ongoing
3.1E	Advocate for large waste producers to reduce emissions and waste by 2027.	Elected officials, NorthCOG	Advocacy groups	$$	Ongoing

Table B-7. Boone County Ordinance Suggestions

Revision or Addition	Ordinance Name	Action/Suggestion
Revision	Data Collection Ordinance	Collect information regarding the characteristics of waste that is disposed and transported by haulers to include in a comprehensive annual report. Criteria shall include the nature of the waste, where it originated from, and tonnage per hauler. Currently reports are required on a monthly basis.
Revision	Data Collection Ordinance for Recyclables	Collect information regarding the disposal of recyclables and compile into a comprehensive annual report. Criteria shall include type of recyclables collected, price per unit, and revenue produced by it' sale. Currently reports are released on a quarterly basis.
Addition	Data Release Ordinance	Requires waste and recycling reports to be easily accessible to the public, such as through a municipality's website.
Revision	Prohibition on Leaf Burning Ordinance	Currently, on-site landscape waste may be burned on-site. This ordinance would ban this practice.
Addition	Mandatory Recycling Options Ordinance	Requires property owners to provide source separated recycling options to tenants.

Table B-8. Winnebago County Ordinance Suggestions

Revision or Addition	Ordinance Name	Action/Suggestion
Addition	Data Collection Ordinance	Collect information regarding the characteristics of waste that is disposed and transported by haulers to include in a comprehensive annual report. Criteria shall include the nature of the waste, where it originated from, and tonnage per hauler. Currently no such reports are required.
Addition	Data Collection Ordinance for Recyclables	Collect information regarding the disposal of recyclables and compile into a comprehensive annual report. Criteria shall include type of recyclables collected, price per unit, and revenue produced by its sale. Currently there is no ordinance requiring this.
Addition	Data Release Ordinance	Requires waste and recycling reports to be easily accessible to the public, such as through a municipality's website.
Addition	Mandatory Recycling Options Ordinance	Requires property owners to provide source separated recycling options to tenants.
Addition	Mandatory Recycling Options Ordinance	Requires property owners to provide source separated recycling options to tenants.

Table B-9. Funding

Goal 1	**Collaborate regionally to maximize funding and programming while prioritizing source reduction efforts.**				
Rec. 1	**Research the costs and benefits of pursuing various solid waste management funding sources.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1A	Create a strategic plan for applying for relevant, recurring grant opportunities.	Winnebago County	Boone County, Region 1 Planning Council	$$	Ongoing
1.1B	Explore mutually beneficial, capacity-building opportunities related to waste management, such as internships or local higher education collaborations.	Winnebago County	Boone County	$$	Ongoing
1.1C	Compile a list of financial resources to be shared across all members of the Solid Waste Advisory Committee.	Region 1 Planning Council	Local government, Local community partners	$$	1 year
1.1D	Create a resource guide, tool kit, or informative report for local area partners on funding opportunities and mechanisms.	Region 1 Planning Council	Local government, Local community partners	$$	1 year
1.1E	Work with existing economic development groups when seeking funding or attracting waste haulers that meet local needs.	Boone County, Winnebago County	Region 1 Planning Council, Economic development groups	$	Ongoing
1.1F	Explore methods to reduce overall waste system and resident costs, such as transitioning to every other week collection for recycling and garbage and weekly collection of compostable materials.	Winnebago County	Boone County, Region 1 Planning Council	$$	1 year
Goal 2	**Receive sufficient public or private funding to implement the Regional Solid Waste Management Plan recommendations.**				
Rec. 1	**Explore public funding mechanisms that support sustainable waste planning and management efforts.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Utilize host fees from the landfill to fund plan implementation efforts.	Winnebago County	Local government	$$	Ongoing
2.1B	Implement a voter-approved, short-term sales tax, or “trash tax”, on haulers serving customers within Boone and Winnebago Counties’ boundaries to help fund waste reduction efforts .	Boone County, Winnebago County	Local government	$$	Ongoing

Table B-10. Material Diversion Goals

Term	Goal
5 Year	**Achieve an overall 35% Traditional Materials diversion rate by 2027**
	Achieve a 53% non-traditional materials diversion rate by 2027
	Achieve a 60% organics diversion rate by 2027
10 Year	**Achieve a 73% organics diversion rate by 2037**
	Achieve a 62% non-traditional materials diversion rate by 2037
	Achieve an overall 60% Traditional Materials diversion rate by 2037
20 Year	**Achieve a 95% non-traditional materials diversion rate by 2042**
	Achieve an overall 85% Traditional Materials diversion rate by 2042
	Achieve an 85% organics diversion rate by 2042

Table B-11. Traditional Materials

5 Year	**Achieve an overall 35% Traditional Materials diversion rate by 2027**
10 Year	**Achieve an overall 60% Traditional Materials diversion rate by 2037**
20 Year	**Achieve an overall 85% Traditional Materials diversion rate by 2042**
Rec. 1	**Promote recycling amongst commercial, institutional, and industrial sectors.**

#	Action	Responsible Parties	Support	Funding	Timeline
1.1	Create a toolkit containing information on waste audits (generation and characterization studies), waste reduction analysis, and a materials marketplace.	Boone County, Winnebago County	Region 1 Planning Council	$$	1 year
1.2	Outline data reporting standards for haulers that support future analysis efforts.	Winnebago County	Boone County, Region 1 Planning Council	$$	Ongoing
Rec. 2	**Promote education on waste minimization and proper recycling through public campaigns.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1	Create education campaigns on the "Dirty Dozen" contaminants using "Rethink, Reduce, Reuse, Recycle"	Winnebago County	Boone County, Local community partners	$$	1 year
2.2	Expand educational efforts to new audiences such as property owners, industrial commercial sector, etc.	Boone County, Winnebago County	Local government, Local community partners	$	Ongoing
2.3	Promote Repair and Share programs for traditional waste materials.	Boone County, Winnebago County	Local government, Local community partners	$	1 year
Rec. 3	**Promote regional sustainable procurement practices.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
3.1	Consider a minimum post-consumer recycled content requirement for procurement for local governments.	Boone County, Winnebago County	Region 1 Planning Council, Local government	$	Ongoing
3.2	Sponsor green procurement workshops.	Boone County, Winnebago County	Local government	$	5 years
3.3	Reward green buying practices in schools and businesses with financial incentives.	Winnebago County	Boone County, Local school districts	$$	Ongoing
3.4	Encourage selection of vendors with sustainability practices in supply chain management.	Boone County, Winnebago County	Region 1 Planning Council, Local government	$	Ongoing
3.5	Promote clean product alternatives within local government contracts and publicly funded institutions.	Boone County, Winnebago County	Region 1 Planning Council, Local government	$	Ongoing
Rec. 4	**Promote product stewardship and responsibility in local industries (commercial and industrial).**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
4.1	Reduce consumer cost barriers for existing local take-back initiatives.	Boone County, Winnebago County	Local government	$	Ongoing
4.2	Encourage environmental best practices amongst local industry and manufacturing businesses.	Boone County, Winnebago County	Local government, Economic development groups	$	Ongoing
4.3	Review and encourage new national and state take-back initiatives for manufacturers and retailers.	Region 1 Planning Council	Local government	$$	Ongoing

Rec. 5	Consider ordinances to increase commercial, industrial, and multifamily recycling.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
5.1	Amend or construct an ordinance requiring recycling infrastructure for dwellings that produce large amounts of waste.	Winnebago County	Boone County, Local government	$$	5 years
5.2	Amend or construct an ordinance requiring recycling infrastructure for high occupancy dwellings.	Boone County, Winnebago County	Local government	$$	5 years
5.3	Amend or construct an ordinance requiring recycling infrastructure for high waste generators in the commercial, industrial and institutional sectors.	Boone County, Winnebago County	Local government	$$	5 years
Rec. 6	**Promote pilot programs and demonstration projects.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
6.1	Consider possible reduction of number of accepted materials or simplification of guidelines.	Boone County, Winnebago County	Local government	$	5 years
6.2	Investigate possible single-stream recycling for low-population communities.	Winnebago County	Boone County, Local government	$$	5 years
6.3	Connect haulers with manufacturers for material-specific diversion opportunities.	Boone County, Winnebago County	Local government	$	Ongoing
Rec. 7	**Plan for seasonal and unexpected waste and recycling surges.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
7.1	Collaborate with Rockford University to plan for end of year student move-out waste surges.	Winnebago County	Higher Education	$	Ongoing
7.2	Form a debris management plan for natural disasters in coordination with state/regional efforts.	Boone County, Winnebago County	FEMA, IEMA	$$	1 year
7.3	Collaborate with municipalities to require event planning/permitting to include diversion plan for public events (concerts, festivals).	Boone County, Winnebago County	Local government	$	5 years

Table B-12. Non-Traditional Materials

5 Year	Achieve a 53% non-traditional materials diversion rate by 2027				
10 Year	**Achieve a 62% non-traditional materials diversion rate by 2037**				
20 Year	**Achieve a 95% non-traditional materials diversion rate by 2042**				
Rec. 1	**Sponsor one day events and or drop off locations for non-traditional materials.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1	Host periodic collection events for non-traditional materials such as HHW, E-waste, polystyrene foam, and tires.	Boone County, Winnebago County	Local community partners	$	Ongoing
Rec. 2	**Monitor legislative actions for opportunities targeting special recycling efforts.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1	Review legislative actions each quarter that impact non-traditional materials collection.	Boone County, Winnebago County	Region 1 Planning Council	$	Ongoing (Quarterly)
Rec. 3	**Promote the reduction and proper disposal of non-traditional materials.**				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
3.1	Develop outreach materials on sustainable alternative products, promote reuse and purchasing practices to find alternatives and/or reduce use of non-traditional materials.	Boone County, Winnebago County	Region 1 Planning Council, Local government and community partners	$	1 year
3.2	Access Illinois EPA non-traditional materials event program information and apply for an event.	Boone County, Winnebago County	Local government	S	1 year
3.3	Research feasibility for siting a partnership-based non-traditional materials recycling facility.	Boone County, Winnebago County, Region 1 Planning Council	Local government	$$	1 year
3.4	Secure permanent drop off locations.	Boone County, Winnebago County	Local government	$	1 year
3.5	Evaluate options for home collection programs for non-traditional materials.	Boone County, Winnebago County, Region 1 Planning Council	Local government	$$	1 year
3.6	Invest in the necessary consumer infrastructure to properly recycle or salvage non-traditional waste.	Boone County, Winnebago County	Local government	$$$	5 years

Rec. 4	Prioritize and explore methods of diverting frequently landfilled or hard-to-recycle items.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
4.1	Explore integrating programs with large waste producers with infrastructure for drop-off items.	Boone County, Winnebago County	Local government	$	1 year

Table B-13. Organics

5 Year	Achieve a 60% organics diversion rate by 2027				
10 Year	Achieve a 73% organics diversion rate by 2037				
20 Year	Achieve an 85% organics diversion rate by 2042				
Goal 1	Increase the source reduction and diversion of non-food organic materials by 75 percent for residential and 45 percent commercial entities by 2026.				
Rec. 1	Promote greenscaping and home management of yard waste.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
1.1	Encourage municipalities to implement local policy encouraging and enabling greenscaping to reduce yard waste.	Boone County, Winnebago County	Region 1 Planning Council, Local government and community partners	$	5 year
1.2	Provide or require reusable bins for yard waste collection.	Boone County, Winnebago County	Waste haulers	$$	5 year
1.3	Require yard waste collection for leaves, prohibiting open burning practices.	Boone County	Local government	$	1 year
Rec. 2	Coordinate with neighboring jurisdictions for seasonal composting events.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1	Evaluate how to incorporate into existing community events.	Boone County, Winnebago County	Local government and community partners	$	Ongoing
2.2	Host an annual leaf collection event.	Boone County, Winnebago County	Local government and community partners	$$	Ongoing
2.3	Host an annual pumpkin collection event.	Boone County, Winnebago County	Local government and community partners	$$	Ongoing
2.4	Host an annual Christmas tree collection event.	Boone County, Winnebago County	Local government and community partners	$$	Ongoing
Goal 2	Increase the source reduction and diversion of food materials by 50 percent for residential and commercial entities by 2026.				
Rec. 1	Evaluate the feasibility of a local food scrap collection and compost program.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.1A	Create an inventory of organic waste infrastructure to determine feasibility of expansion. Evaluate existing organics collection infrastructure to accommodate additional materials.	Boone County, Winnebago County	Region 1 Planning Council, Waste haulers, Local community partners	$$	1 year
2.1B	Explore options that enable curbside organic waste (food and yard waste) collection to be transported to a large scale composting site in the area.	Boone County, Winnebago County	Region 1 Planning Council, Waste haulers, Local community partners	$	1 year
2.1C	Partner with local community organizations such as KNIB to educate the public on the benefits of composting.	Winnebago County	Local community partners, Local school districts	$$	Ongoing
Rec. 2	Evaluate the feasibility of voluntary or mandated food scrap composting programs.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.2A	Consider voluntary and mandatory composting for residential, commercial, and industrial properties.	Boone County, Winnebago County	Region 1 Planning Council, Local community partners	$$	5 year
2.2B	Periodically re-evaluate food scrap composting programming amid new information to increase diversion efforts.	Boone County, Winnebago County	Local community partners	$	Ongoing
Rec. 3	Develop opportunities for pre- and post- consumer food recovery.				
#	**Action**	**Responsible Parties**	**Support**	**Funding**	**Timeline**
2.3A	Engage quarterly with communities, commercial entities, schools, etc., to identify food recovery opportunities.	Boone County, Winnebago County	Local government	$$	Ongoing
2.3B	Connect local food banks with large scale food waste generators to reduce food waste.	Boone County, Winnebago County	Local government, Local community partners	$$	Ongoing

Appendix C: Existing & Model Ordinances

Existing Codes Related to Waste: Boone County

Chapter 26: FIRE PREVENTION AND PROTECTION

ARTICLE I. IN GENERAL

Sec. 26-2. - Open burning—Prohibited (Applies to unincorporated areas only).

The open burning of garbage, rubbish, and refuse is not allowed in any part of the county at any time pursuant to the Boone County Code of Ordinances, the International Fire Code, the Illinois Environmental Protection Act, and other regulations. Refuse includes, but is not limited to, materials such as discarded paper, cardboard, lumber, metal, plastic, cloth, glass, rubber, ceramics, synthetic materials, construction and demolition debris, discarded household items, commercial/trade waste, animal carcasses, manure, rubbish, garbage, off-site-generated flora and landscape waste, and any discarded matter which is burned for waste disposal purposes. On-site generated flora and landscape waste may be burned on-site. Burning in a metal drum or similar object is considered open burning.

Chapter 34: Garbage, Trash and Refuse

Article II. - Garbage Disposal Areas and Vehicles

Sec. 34-26: Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Garbage: Garbage means any refuse, products, or materials, including, but not limited to, the following: Putrescible animal and vegetable wastes resulting from the handling, preparation, cooking, sale, or consumption of food; human and animal excretion; glass or metal containers, products, or objects discarded as no longer usable; paper, wood, and cardboard waste; uprooted weeds, grass clippings, leaves, and the like; ashes and cinders; discarded furniture or clothing; and dead animals.

Garbage Disposal Area: Garbage disposal area means any area within a county but outside any city, village, or incorporated town in such county to which garbage is hauled for disposal. The term "garbage disposal" does not include the area on any person's land used for disposal of garbage from such person's own household nor does it include areas maintained by any incorporated city, village, or town.

(Ord. of 12-12-1973, § 2; Code 1981, § 9-16)

Cross reference— Definitions generally, § 1-2.

Sec. 34-27. Scope of Article.

This article is not intended and shall not be construed to prohibit a resident of the county from hauling his own garbage in his personal vehicle, provided that the garbage is hauled to and deposited in a licensed garbage disposal area.

(Ord. of 12-12-1973, § 19; Code 1981, § 9-17)

Sec. 34-28. Transportation of Garbage Restricted.

The following restrictions shall apply to the transportation of garbage within the county:

It shall be unlawful for any person or any combination of persons to haul garbage a distance of greater than 25 miles from the garbage disposal area where the garbage will be disposed.

It shall be unlawful to transport garbage from outside the county except in totally enclosed trucks or units.

It shall be unlawful to transport garbage in the county that has not been deposited in a state-approved landfill within 24 hours of the time it is collected.

It shall be unlawful to transport garbage in the county except between the hours of 6:00 a.m. and 6:00 p.m.

It shall be unlawful to transport garbage into or out of the county by railroad car, pipeline or any other method except motor vehicle.

(Ord. of 12-12-1973, §§ 7—11; Code 1981, § 9-18)

Cross reference— Motor vehicles and traffic, Ch. 54.

Sec. 34-29. Monthly reports of collectors.

Each person operating a garbage collection, disposal, or transportation firm in the county shall file a monthly report with the county clerk specifying the number of vehicles used in that business, the nature and source of the refuse collected, transported, or disposed of and the total tonnage collected, transported, or disposed of. For the purpose of crosschecking these reports, the records of such persons shall be open to reasonable inspection by the county or an agent of the county.

(Ord. of 12-12-1973, § 13; Code 1981, § 9-19)

Sec. 34-30. Inspections.

The county or any authorized agent shall have authority to inspect at any time or place any vehicle used in hauling garbage or any garbage disposal area and shall have the authority to enter any licensed premises used as a garbage disposal area and make appropriate tests on monitoring wells or other facilities at reasonable times in order to ensure that all state and local standards regarding the operation of such vehicles and sites are met.

(Ord. of 12-12-1973, § 16; Code 1981, § 9-21)

Sec. 34-31. Violations; penalties.

Any person who violates this article or any of the rules and regulations adopted pursuant to law shall be deemed to have committed a misdemeanor and shall be punished by a suspension or revocation of any license held or as provided in Section 1-10, or by both such suspension or revocation and penalty.

(Ord. of 12-12-1973, § 18; Code 1981, § 9-22)

ARTICLE III. CITY/COUNTY LANDFILL

Sec. 34-56. Depositing grass Clippings, Etc., in City/ County Landfill.

Beginning May 1, 1989, no grass clippings, leaf, garden, and/or lawn waste shall be deposited in the city/county landfill, known as landfill No. 2.

(Code 1981, § 9-51; Ord. No. 89-12, § 19.1, 4-12-1989)

ARTICLE IV. RECYCLING

Sec. 34-91: Containers-Generally.

Any privately or publicly operated refuse collection service shall be required to provide each residential customer so served with a container to be used for collection and regular pickup of certain recyclable items as specified by the county.

(Code 1981, § 9-70; Ord. No. 90-6, 4-11-1990)

Sec. 34-82. Same—Areas provided.

Providing customers with a container for recyclable items and the subsequent pickup of those items shall be done in areas where it is reasonable and compensatory to the refuse collection service.

(Code 1981, § 9-71; Ord. No. 90-6, 4-11-1990)

Sec. 34-83. Operation of Licensed Refuse Collection Services.

The license holder shall operate under the following conditions:

1. The license holder will be required to either sell or provide to each residential customer a single, 12-gallon minimum, rectangular open top container for the purpose of collecting recyclable items. The containers shall be approved by the county prior to delivery to the homeowners.
2. The license holder agrees to pick up and have recycled the following recyclable materials, which are not to be placed in regular refuse containers:
    a. Newsprint.
    b. Clean glass food and beverage bottles/containers.
    c. Aluminum food and beverage containers.
    d. Steel/tin food and beverage containers.

Other items may be collected by the license holder for recycling at his discretion. The above categories of recyclable materials must be properly sorted and separated and placed at the curb in the open containers. Recyclable materials which include waste/ refuse will not be picked up.

1. At such a time that market conditions would prohibit the license holder from selling collected recyclables, the county board chairman may, at the request of the license holder, waive the requirement to collect the recyclable so affected. It is understood that if this condition arises, the license holder may, at his option, continue to collect the material but dispose of it with the regular refuse.
2. The recyclable materials will be picked up on the same day as the refuse/garbage.
3. The license holder shall furnish the county with quarterly statistical reports showing quantities, by type, of all recyclables collected, prices per unit, and revenues generated by their sale. Such reports shall have any information necessary to comply with state mandated requirements.
4. Collection and disposal of items designated as household refuse or household garbage shall be made not less than once a week. The frequency of collection of recyclable materials shall be at the discretion of the license holder. However, collection of recyclables shall be not less than once per month.
5. The license holder may continue to collect any refuse of any commercial, business, or industrial establishment, schools or other buildings occupied by a public body, subject to any and all of the regulations governing private scavengers.

(Code 1981, § 9-72; Ord. No. 90-6, 4-11-1990)

Sec. 34-84. Electric recycling fees.

Electronic items shall be subject to the following fees:

1. First TV/monitor per resident per calendar year: no charge when received during operating hours.
    a. TVs/monitors 20” or less $20.00
    b. TVs/monitors larger than 20” $30.00
    c. Non-Boone County Resident $40.00
    d. Fee when facility closed or unstaffed $200.00

(Ord. No. 19-12, 1-16-2019)

Chapter 38: Health and Sanitation

Article I. IN GENERAL

Sec. 38-2. Siting fees for new regional pollution control facility.

There shall be paid to the county clerk for delivery to the county treasurer for deposit in the general fund at the time of the filing of an application for any new regional pollution control facility that is not a sanitary or hazardous waste landfill a fee of $100,000.00. If costs incurred by the county for review of each applicant total amount below the $100,000.00 fee, the difference between the fee and the actual expenses shall be refunded to the applicant. If costs incurred by the county for review of all applications total an amount in excess of $100,000.00, the applicant shall reimburse the county for such expenses.

There shall be paid to the county clerk for delivery to the county treasurer for deposit in the general fund at the time of the filing of an application for a sanitary or hazardous landfill a fee of $125,000.00. If costs incurred by the county for review of each applicant total amount below the $125,000.00 fee, the difference between the fee and the actual expenses shall be refunded to the applicant. If costs incurred by the county for review of all applications total an amount in excess of $125,000.00, the applicant shall reimburse the county for such expenses.

Previous regional pollution control facility siting fees set by the county board are hereby repealed from and after the effective date of the ordinance from which this section is derived.

(Ord. No. 05-30, 7-13-2005)
Cross reference— City/county landfill, § 34-56.

Article II. PUBLIC HEALTH ORDINANCE

DIVISION 1. GENERALLY

Sec. 38-27. Definitions.

The following words, terms and phrases, when used in this article, shall have the meanings ascribed to them in this article, except where the context clearly indicates a different meaning:

Blight means a dilapidated structure in need of repair and/or surrounding area exhibiting nuisance violations.

Dump means areas in which non putrefactive material is permitted to be deposited.

Dwelling means any structure, including, but not limited to, residential, commercial, industrial or agriculture.

Garbage shall mean any organic waste matter which is subject to putrification.

Health authority means the legally designated health administrator of the county or his duly authorized representative.

Rubbish shall mean organic or inorganic waste material which is not subject to putrification.

Sanitary landfill means a method of disposing of garbage or rubbish in accordance with United States Environmental Protection Agency regulations.

Sewage means the water-carried human wastes and other liquid wastes from residences, business buildings, industrial establishments, or other places.

Solid waste disposal area means a sanitary landfill or a dumping site.

(Ord. No. 05-30, 7-13-2005)

DIVISION 2. NUISANCES

Sec.38-71. Garbage disposal.

No person shall discharge, deposit, place, or permit the discharging, depositing, or placing on any premises, except the sanitary landfills in the county, of any garbage, filth, offal, or refuse accumulations of animal, fruit, or vegetable matter, other noxious matter or substance, or waste from sewage disposal facilities which by reason of its quantity or decomposition would become foul, odorous, subject to spontaneous combustion, or otherwise become detrimental to public health or conducive to the spread of disease. It is unlawful to place garbage or rubbish in the streets, alleys, or roadways.

Garbage and all empty food and beverage containers must be placed in a closed container. This container must be rodent- and fly-resistant. Garbage to be put out for pickup may be stored in plastic bags for a maximum of 24 hours. This section applies to all zone districts except A-1, as defined by the county zoning ordinance.

(Ord. No. 05-30, 7-13-2005)
Cross reference— Garbage disposal areas and vehicles, § 34-26 et seq.

Sec. 38-72. Rubbish disposal.

No person shall deposit or place or permit the depositing or placing of rubbish in any such manner as to become a nuisance or otherwise become detrimental to public health or conducive to the spread of disease.

(Ord. No. 05-30, 7-13-2005)

Sec. 38-74. Hauling wastes.

Any vehicle used for the purpose of carrying, carting, hauling, or transporting garbage, rubbish, or miscellaneous waste shall be so constructed as to prevent any part of the contents thereof from falling, leaking or spilling therefrom.

(Ord. No. 05-30, 7-13-2005)
Cross reference— Garbage, trash and refuse, Ch. 34.

DIVISION 4. RESPONSIBILITIES OF OWNERS AND OCCUPANTS

Sec. 38-144. Disposition of rubbish and garbage.

Every occupant of a dwelling or dwelling unit shall store and dispose of all his rubbish in a clean, sanitary, and safe manner.

Every occupant of a dwelling or dwelling unit shall store and dispose of all his garbage and any other organic waste which might provide food for insects and/or rats in a clean, sanitary, and safe manner. Rodent resistant, insect resistant, watertight refuse containers shall be used for storage pending collection.

Every owner of a dwelling containing three or more dwelling units shall supply facilities or refuse containers for the sanitary and safe storage and/or disposal of rubbish and garbage. In the case of single-family or two-family dwellings, it shall be the responsibility of the occupant to furnish such facilities or refuse containers.

(Ord. No. 05-30, 7-13-2005)

Chapter 42: ENVIRONMENT

Article II. REGIONAL POLLUTION CONTROL FACILITY SITING

Sec. 42-31. Title.

This article shall be known, cited and referred to as the "Pollution Control Facility Siting Ordinance of Winnebago County, Illinois."

(Code 1964, § 13C-1; Ord. No. 2005-CO-35, § 1, 3-24-05)

Sec. 42-32. Definitions.

The terms used in this article shall have the same meanings as the same terms are defined in the state Environmental Protection Act, 415 ILCS 5/1 et seq. (referred to as the state Environmental Protection Act), in effect as of October 23, 1986, and as such statute may be amended or modified from time to time.

(Code 1964, § 13C-3)
Cross reference(s)—Definitions generally, § 1-2.

Sec. 42-33. Application.

All applications for site location approval for pollution control facilities pursuant to the state Environmental Protection Act shall be made in writing and filed with the county clerk. The applications shall conform to the following:

1. Requirements. The application shall conform to the following:
    a. Four copies of the application and all exhibits thereto shall be filed with the county clerk.
    b. The application shall be typed on paper 8½ inches × 11 inches in size and shall be securely bound in the left hand margin.
    c. The application shall contain the information specified in subsections (1) through (6) of this section.
    d. The application shall be signed by the applicant, or if the application is filed by a corporation, it shall be signed by its principal executive officer.
    e. The fact sheet of the application shall contain only the following information:
        1. A statement that it is an application for approval of a site for a new regional pollution control facility.
        2. A statement indicating whether it is an application for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste incinerator, or any combination thereof, or any other type of regional pollution control facility governed by the state Environmental Protection Act.
        3. The name of the applicant.
        4. The principal business address and telephone number of the applicant.
        5. The name, address, telephone number and title of the person designated by the applicant as its agent for service of notices.
2. Background of applicant. The application shall contain the applicant's full name, address and telephone number. If a partnership, the names and addresses of all partners and the telephone number of the partnership shall be listed. If a corporation, the names and addresses of all shareholders owning ten percent or more of the capital stock of the corporation and the telephone number of the corporation shall be listed.
3. Site information. Information required for the site shall be as follows:
    a. The application shall contain a legal description of the proposed site and a street address or some other reasonable description of where the proposed site is located.
    b. The application shall set forth the names, addresses and telephone numbers of the owners of the site, if other than the applicant. If the site is owned by a trust, the names, addresses and telephone numbers of all of the beneficiaries shall be set forth, and a copy of the trust agreement shall be attached to the application as an exhibit. If the site is owned by a corporation, all of the information required by subsection (2) of this section shall be furnished in the application as to the owning corporation. If the site is not owned by the applicant, the application shall describe all documents giving the applicant the right to use the site for the purposes listed in the application. The applicant shall attach copies of all the documents to the application as exhibits.
4. Proposed service area. The application shall define the geographic area that the proposed facility is intended to serve.
5. Floodplain. The application shall include a statement that the facility is within or outside of the boundary of the 100-year floodplain as determined by the state department of transportation.
6. Notices. Copies of the notices required to be served under the state Environmental Protection Act, as existing or hereafter amended, shall be filed with the application.

(Code 1964, § 13C-4; Ord. No. 2005-CO-35, § 1, 3-24-05; Ord. No. 2011-CO-69, 12-8-11)

Sec. 42-34. Effective date of filing.

a. No application for site approval shall be deemed to have been filed or accepted for filing unless all of the requirements of this article shall have been met. The county clerk shall not give a receipt or other indication of filing until such time as it has been determined that the application complies with the requirements of this article. Within a reasonable period of time after delivery of an application, the county clerk shall advise the applicant either:
    - That the application is complete and that it has been accepted for filing, designating the date of filing; or
    - That the application is not complete, specifying wherein it is deficient.
    - Reserved.

(Code 1964, § 13C-5; Ord. No. 2011-CO-69, 12-8-11)

Sec. 42-35. Filing fee.

a. Each application for a waste storage site, sanitary landfill, waste disposal site, waste transfer station, waste incinerator, or any combination thereof, shall be accompanied by a $100,000.00 filing fee, and all other applications shall be accompanied by a $10,000.00 filing fee, which shall be used to defray the actual costs incurred by the county in the siting review process, including, but not limited to, the costs involved in conducting the required hearings and court reporting and transcription fees.

b. Within a reasonable time after all proceedings have been completed as to any application, the county board shall make a determination as to the total costs incurred by the county in the siting review process and shall order any excess of the fee paid with the application to be refunded promptly to the applicant. However, in no case will any amount of interest on the refunded amount be refunded to the applicant. If the actual costs incurred exceed the filing fee, the applicant will be notified and will promptly remit the amount needed to cover the actual costs incurred by the county.

(Code 1964, § 13C-6; Ord. No. 2005-CO-05, §§ 2, 3, 3-24-05)

Sec. 42-36. County clerk's duties.

Upon receipt of an application for site location approval, the county clerk shall transmit a copy of that application to the chairman of the county board and to the county state's attorney. Furthermore, upon receipt of any written comment from any person concerning the appropriateness of the proposed site, the county clerk shall transmit a copy of that written comment to the chairman of the county board and to the county state's attorney.

(Code 1964, § 13C-7)

Sec. 42-37. Public inspection duties.

A copy of the application shall be made available for public inspection in the office of the county clerk. Members of the public shall be allowed to obtain a copy of the application or any part thereof upon payment of the actual cost of reproduction.

(Code 1964, § 13C-8)

Sec. 42-38. Public comment.

a. The county clerk shall receive and file written comments from any person concerning the appropriateness of the proposed site. Upon receipt of any such written comment, the county clerk shall date stamp the written comment and immediately deliver a copy to the chairman of the county board and to the county state's attorney.

b. Copies of such written comments shall be made available for public inspection in the office of the county clerk. Members of the public shall be allowed to obtain a copy of any written comment upon payment of the actual cost of reproduction.

Chapter 58: PARKS AND RECREATION

ARTICLE II. MOTORBOAT SAFETY

Sec. 58-37. Waterway litter.

It is unlawful to leave, deposit, place, or throw on the waters, ice, shores or water or upon public or private property any cans, bottles, debris, refuse or solid waste material.

(Ord. No. 89-CO-52, § XI, 9-7-89)

Chapter 70: SOLID WASTE

ARTICLE I. IN GENERAL

Sec. 70-1. Definitions.

The following words, terms and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning:

Commercial purpose means the carriage of persons or property for any fare, fee, rate, charge or other consideration, or directly or indirectly in connection with any business or other undertaking intended for profit.

Garbage means any refuse products or material including, but not limited to, the following: putrescible animal and vegetable wastes resulting from the handling, preparation, cooking, sale or consumption of food; animal excretion; glass or metal containers, products or objects discarded as no longer useable; paper, wood, and cardboard waste; yard waste such as uprooted weeds, grass clippings, leaves and the like; ashes and cinders; discarded furniture or clothing; and dead animals. The term "garbage" does not include human excretion in the form of body waste.

Health officer means the Public Health Administrator of the Winnebago County Health Department.

Garbage hauling vehicle means any vehicle used for the commercial purpose of carrying, charting, hauling, or transporting garbage to a garbage disposal area, including, but not limited to, front loader garbage trucks, rear loader (packer) garbage trucks, side loader garbage trucks, roll-off garbage trucks (dumpers), grapple trucks, flatbed trucks, and all other vehicles displaying an H plate or more.

(Code 1964, § 9-1; Ord. No. 88-CO-5, § A, 2-11-88; Ord. No. 97-CO-24, 4-10-97; Ord. No. 2019-CO-111, § A, 11-26-19, eff. 1-1-20)

Cross reference— Definitions generally, § 1-2.

Sec. 70-3. Depositing; discharging; placing of garbage and other filthy substances on premises or streets.

It shall be unlawful for any person to discharge, deposit, place or permit the discharging, depositing or placing on any premises in the county, of any garbage, filth, offal or refuse accumulations of animal, fruit or vegetable matter, other nauseous matter or substance, or waste from sewage disposal facilities, which by reason of its quality or decomposition would become foul, odorous, subject to spontaneous combustion or otherwise become detrimental to public health or conducive to the spread of disease. It is unlawful to place garbage or rubbish in the streets, alleys or roadways.

(Code 1964, § 9-8)

Sec. 70-4. Garbage disposal.

a. All persons within the county who accumulate garbage shall dispose of it in an approved manner and in a suitable container of metal or plastic with fitted covers.

b. All garbage shall be placed in a container, as set forth above, and removed at least once per week. All persons generating garbage shall keep a record of who is removing such garbage.

c. All garbage hauling vehicles transporting garbage to a garbage disposal area in Winnebago County must be properly permitted as set forth in section 70-6.

(Code 1964, § 9-9; Ord. No. 88-CO-5, §§ C, D, 2-11-88; Ord. No. 2019-CO-111, § C, 11-26-19, eff. 1-1-20)

Sec. 70-5. Depositing rubbish on premises.

It shall be unlawful for any person to deposit or place, or permit the depositing or placing, on any premises in the county, rubbish in such manner as to become a nuisance or otherwise become detrimental to public health or conducive to the spread of disease.

(Code 1964, § 9-10)

Sec. 70-6. Hauling garbage and rubbish.

a. Owners duty to prevent spills. No person owning or controlling any garbage hauling vehicle, or any other vehicle used to haul garbage, shall cause or permit any vehicle to be so loaded, to be in such defective condition, so out of repair, faultily constructed, or so improperly driven or managed that any garbage with which such vehicle is loaded, or is being loaded, shall drop or fall on any public way or other place. Such vehicle shall be so constructed and covered as to prevent any part of the contents thereof from falling, leaking or spilling therefrom. Vehicles that transport garbage in a manner that is not fully enclosed shall ensure that the transport container is covered, by a tarp or other effective means, at all times when the vehicle is operating in the county, including after depositing any garbage being transported.

b. Permit required; procedures. Any person owning or controlling any garbage hauling vehicles transporting garbage to a garbage disposal area in Winnebago County shall obtain permits for the vehicles from the Winnebago County Health Department and comply with the following terms and conditions:

3. Application. Permit forms shall be furnished by the health department for the applicant to provide the following information: name and address of hauler, a description of each vehicle to be permitted, vehicle license plate, and vehicle identification number. Permit applications shall be submitted at least 30 days prior to the first day of the quarter in which the annual permit is to be issued, as set forth below.

4. Inspection. All vehicles to be permitted will be inspected. Inspections shall be completed prior to permits being issued. Inspections shall consist of checking whether the vehicle can contain the type of garbage it will be used to haul without leaking, the wind blowing, or otherwise discharging any garbage prior to or after its disposal destination. The health officer or his or her designee shall inspect any three or more refuse hauling vehicles at a reasonable time, quartered at the same site in the county. Persons owning or operating fewer than three garbage hauling vehicles shall arrange with the health officer a reasonable time and place for inspection. Regardless of permit status, the health officer may inspect any garbage hauling vehicle at any time or place to ensure that its condition and operation are in compliance with this chapter and in the interest of public health and safety.

5. Term. The term of annual permits shall be staggered by county fiscal year quarters depending on the number of garbage hauling vehicles to be permitted:

Date Range	No. of Vehicles
October 1-September 30	76 or more vehicles
January 1-December 31	51-75 vehicles
April 1-March 31	11-50 vehicles
July 1-June 30	1-10 vehicles

6. Insurance. All permit applicants must provide a policy or certificate of insurance demonstrating both vehicle liability insurance and comprehensive general liability insurance with limits each of not less than $1,000,000.00 each person, $3,000,000.00 each accident bodily injury liability, and $1,000,000.00 each accident property damage liability. Said insurance may not be changed or canceled without at least 30 days prior written notice to the health department.

7. Identification. At the time of permit issuance, the health officer shall provide two decals for each vehicle, one of which is to be affixed to the driver's side windshield and the other to be placed on the rear of the garbage hauling vehicle. Both decals must be visible at all times. No vehicle may be used without displaying said decals.

8. Violations. Failure to comply with any of the provisions in this section may be punished by suspension of the permit and a fine of up to $1,000.00. Each day that a violation exists shall be considered a separate offense. In addition to other penalties and procedures authorized by law or this Code, a violation of this section is also subject to the code enforcement procedures set forth in chapter 4 of this Code.

9. Fees. The permit fees for garbage hauling vehicles shall be $50.00 per vehicle per annum. An inspection fee of $100.00 per vehicle per annum shall be assessed to cover the cost of the vehicle inspection.

10. A late fee of $100.00 will be assessed for each permit application received on or after the first day of the quarter in which it was due.

(Code 1964, § 9-11; Ord. No. 88-CO-5, § E, 2-11-88; Ord. No. 2001-CO-63, 10-25-01; Ord. No. 2003-CO-147, 10-23-03; Ord. No. 2008-CO-48, 8-14-08; Ord. No. 2010-CO-73, 9-2-10; Ord. No. 2019-CO-111, § D, 11-26-19, eff. 1-1-20)

Sec. 70-7. Garbage debris and removal.

If the owner of the property refuses or neglects to remove garbage and debris from the property, such garbage and debris may be removed by the county and the cost of such removal may be collected from the property owner in the following manner:

Notice of the county's intention to remove garbage and debris from the property shall be given to the property owner or owners by mailing a written copy of the notice to the last known address of each owner at least 15 days prior to such removal by the county;

Within 60 days of the county incurring such costs, the county or person performing the removal by the authority of the county in his own name, files notice of lien in the county recorder's office which notice shall consist of a sworn statement setting out:

A description of the real estate sufficient for identification;

The amount of money representing the cost and expense incurred or payable for the service; and

The date or dates when the costs were incurred by the county.

(Ord. No. 97-CO-24, 4-10-97)

Sec. 70-8. Violation subject to code enforcement procedure.

In addition to other penalties and procedures authorized by law or this Code, a violation of sections 70-3 through 70-6 is also subject to the code enforcement procedures set forth in chapter 4 of this Code.

(Ord. No. 97-CO-67, § III, 12-11-97)

ARTICLE II. SANITARY LANDFILLS

Sec. 70-31. Penalty for violation of article.

Any operator who shall violate any provision of this article shall be subject to a fine of not less than $100.00 or more than $1,000.00. Each day's failure to comply with any such provision shall constitute a separate violation.

(Code 1964, § 9-166; Ord. No. 2019-CO-111, § E, 11-26-19, eff. 1-1-20)

Sec. 70-32. Permit required.

An operator of a sanitary landfill in the county shall first obtain a permit from the county. The annual fee for a permit required by this section shall be $500.00.

(Code 1964, § 9-158; Ord. No. 2019-CO-111, § E, 11-26-19, eff. 1-1-20)

Sec. 70-33. Bond required.

The operator of a sanitary landfill shall deliver to the health department a cash or corporate bond in the sum of $5,000.00. Such case or corporate bond shall run to the county and shall be conditioned as follows:

The operator, their agents and employees will comply with all of the terms, conditions, provisions, requirements and specifications contained in this article and with all federal, state and local laws and regulations.

The operator will save harmless the county from any expense incurred through the failure of the operator, his agents or employees to operate and maintain the sanitary landfill in accordance with this article and all federal, state and local laws and regulations, including any expense the county may incur for correcting any violation or from any damages growing out of the negligence of the operator, his agents or employees.

Such bond shall run for a period of two years after the landfill site has been finished and brought to final grade.

(Code 1964, § 9-159; Ord. No. 2019-CO-111, § E, 11-26-19, eff. 1-1-20)

Sec. 70-34. Inspections; right of entry of health officer.

The health officer or his or her designee shall make inspections of each sanitary landfill as often as he/she deems necessary and will report any major discrepancies to the county board. An operator shall allow the health officer or his or her designee upon the premises at all reasonable times for the purpose of inspecting the landfill.

(Code 1964, § 9-160; Ord. No. 2019-CO-111, § E, 11-26-19, eff. 1-1-20)

Sec. 70-35. Hearings before health officer.

Any person affected by any notice in connection with the enforcement of the provisions of this article, or any rule or regulation adopted pursuant thereto, as provided by this article, may request and shall be granted a hearing on the matter before the health officer, provided that such person shall file in the office of the health officer a written petition requesting such hearing and setting forth a brief statement of the grounds therefor within ten days after such notice has been served.

Upon receipt of such petition, the health officer shall set a time and place for such hearing and shall give the petitioner written notice thereof. At such hearing, the petitioner shall be given an opportunity to be heard and to show why such notice should be modified or withdrawn, provided that, upon application of the petitioner, the health officer may postpone the date of the hearing for a reasonable time beyond such ten-day period if, in his judgment, the petitioner has submitted a good and sufficient reason for such postponement. (Code 1964, § 9-161)

Sec. 70-36. Action on notice following hearing.

After such hearing, the health officer shall sustain, modify or withdraw such notice, depending upon his findings as to whether the provisions of this article and of the rules and regulations adopted pursuant thereto have been obeyed. If the health officer sustains or modifies such notice, it shall be deemed an order.

(Code 1964, § 9-162)

Sec. 70-37. Permit revoked if notice suspending permit sustained.

If a notice suspending any permit has been sustained by the health officer, the permit shall be revoked. Any such permit which has been suspended by a notice shall be automatically revoked if a petition for hearing is not filed in the office of the health officer within ten days after such notice is served.

(Code 1964, § 9-163)

Sec. 70-38. Summary of record of hearing.

The proceedings of such hearing, including the findings and decision of the health officer, shall be summarized, reduced to writing and entered as a matter of public record in the office of the health officer. Such record shall also include a copy of every notice or order issued in connection with the matter.

(Code 1964, § 9-164)

Sec. 70-39. Emergency orders by health officer.

Whenever the health officer finds that an emergency exists which requires immediate action to protect the public health, he may, without notice or hearing, issue an order reciting the existence of such an emergency and requiring such action to be taken as he deems necessary to meet the emergency. Notwithstanding the other provisions of this article, such order shall be effective immediately. Any operator to whom such order is directed shall comply therewith immediately, but upon written petition to the health officer shall be afforded a hearing within ten days. After such hearing, the health officer shall continue such order in effect, modify it or revoke it.

(Code 1964, § 9-165)

Chapter 86: UTILITIES

Article II SEWERS AND SEWAGE DISPOSAL

Sec. 86-30. Type of waste.

A private sewage disposal system shall be designed to receive all domestic sewage from the buildings served. No cooling water, groundwater, discharge from roof drains, discharge from footing tile drains, swimming pool wastewater, or other clear water discharges shall be directed to the private sewage disposal system. No automotive grease or oil or toxic wastes, or any other waste other than domestic waste shall be discharged to a domestic private sewage system. Commercial private sewage systems must meet state requirements for grease and oil. *Note: Water softener backwash should bypass the septic tank directly to the septic field or to a separate field line.*

(Ord. No. 2008-CO-26, 3-28-08)

Model Ordinances

Source Reduction Ordinance Template

This template was modeled after the following existing ordinances:

- Universal Zero Waste Ordinance – City of Boulder, Colorado
  - Ordinance No. 8045
  - Adopted 6/17/2015
- Refuse Separation Compliance Ordinance 2018 – San Francisco, California
  - Ordinance No. 300-18
  - Amended in Board 12/4/2018

DEFINITIONS

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

NOTE: For context purposes, definitions reflect the meanings established by the original ordinance that were referenced to create the following model ordinance.

Special Events means temporary events held on special occasions in a public space, such as fairs, festivals, and similar events.

Waste Collection Services means services that collect waste from designated pick-up points.

Source Reduction means reducing waste by eliminating it before it is generated.

Business Owner means the owner/operator of a business who is responsible for functions and services for said business, including trash/recyclable collection.

Compostables means organic materials that have the capability to break down naturally in the environment to produce compost.

Landfill means a site in which waste is taken to be disposed of.

Large Waste Generator means a property that generates large quantities of waste (greater than 40 cubic yards per week of un-compacted waste).

Owner means the individual/individuals who claim ownership or responsibility of any property, including personal and commercial properties.

Property Owner means the owner/operator of a property who is responsible for functions and services for said property, including trash/recyclable collection.

Recyclables means materials that can be repurposed into other materials.

Source Separation refers to the process in which recyclables and compostables are separated from waste at the point of generation to reduce the amount of waste disposed of in landfills.

Trash Container means a container that is approved to carry and transport waste until it can be taken to a landfill, or recycling/composting facility.

Waste means materials and substances from human/commercial/industrial/agricultural activities that no longer have a use.

Waste Pathways refers to where unwanted materials go once disposed of (landfill, recycling/compost facility).

Zero waste refers to the initiative to significantly reduce the amount of waste in the waste system by separating recyclables and compostables at the point of generation to divert them from landfills.

ARTICLE 1. PURPOSE

PURPOSE

The purpose of this ordinance is to achieve "zero waste" by significantly reducing the amount of waste that is disposed of in landfills. This is to be done by requiring recyclable and compostable waste be separated at the source of generation for it to be handled properly and thus diverted from landfills.

APPLICABLE REGULATION

The following Regulatory instruments are applicable to the subject of zero waste:

- 40 CFR Part 246
- Resource Conservation and Recovery Act (RCRA)

SCOPE

The ordinance applies to the reduction and source separation of waste by enforcing the appropriate disposal of recyclable and compostable materials from property owners, businesses, and waste collectors.

MONITORING AND ENFORCEMENT

Waste in visible areas (such as alleyways or curb sides) is subject to inspection and reporting by local law enforcement if there are visible issues present with the waste containers. This includes visible and excessive amounts of waste that are improperly sorted or disposed of. Citizens who observe improper waste disposal practices are encouraged to inform the proper authorities to enforce this ordinance. Waste collection services have the responsibility to inform the waste generator if issues in disposal practices are observed. If the improper sorting and disposal continues after written warning, the generator may be subject to violation fines.

ARTICLE 2. REQUIREMENTS BY GENERATOR TYPE

PROPERTY OWNER/MANAGER REQUIREMENTS

1. It is the responsibility of property owners and property managers to ensure that on-site collection areas for recyclables and compostables are present. These collection areas shall be in close proximity to the building and be reasonably accessible to all tenants inhabiting the property.

2. Janitorial services for residential properties shall accommodate waste source separation practices for separate recycling and composting containers when disposing of waste.
3. Property owners and managers should conduct annual training to tenants regarding the collection and location of recyclable and compostable collection areas. New tenants to the property shall be told this information within 30 days of their move-in date. Any alterations regarding the location or method of recyclable or compostable waste collection must be conveyed to all tenants within 14 days of the alteration.
4. Records of waste management practices shall be kept for a minimum of three years and are subject to inspection from county authorities.

BUSINESS REQUIREMENTS

1. It is the responsibility of business owners and managers to ensure that on-site collection areas for recyclables and compostables are present. These collection areas shall be in close proximity to the building and be reasonably accessible to employees and customers.
2. Janitorial services for businesses shall accommodate waste source separation practices for separate recycling and composting containers when disposing of waste.
3. Business owners and managers should conduct annual training to employees regarding the collection and location of recyclable and compostable collection areas. New employees to the business must be told this information within the first 30 days of employment. Any alterations regarding the location or method of recyclable or compostable waste collection must be conveyed to all employees within 14 days of the alteration.
4. Records of waste management practices shall be kept for a minimum of three years and are subject to inspection from city authorities.
5. Businesses shall display instructions for the proper disposal of recyclable or compostable waste near each collection container. These instructions shall be written in both English and Spanish languages or only be composed of descriptive illustrations.

LARGE WASTE GENERATOR REQUIREMENTS

It is more difficult for large waste generators to enforce proper separation and disposal of waste, so they may be more likely to have cross contamination of waste pathways. For this reason, facilities that generate greater than 40 cubic yards per week of un-compacted waste will be subjected to a waste audit at least once every three years.

SPECIAL EVENT REQUIREMENTS

1. Special events hosted by municipalities shall provide appropriate waste containers, including containers for recyclable and compostable waste. These containers shall be in an accessible area and have the capacity to handle the waste produced by the event.
2. These containers shall display instructions or imagery near waste containers to demonstrate how to appropriately dispose of waste.

WASTE COLLECTION SERVICES REQUIREMENTS

1. Waste collection services shall provide separate containers to customers to separate waste. These shall be a designated container for recyclables, compostables, and other waste.
2. These collection containers shall display the name of the collection company in which they belong and they shall either be labeled or color coded to indicate their purpose.
3. It is the responsibility of the customer to separate the waste which they generate, and it is the responsibility of the collection service to oversee the collection. If errors in separation are noticed, collectors shall inform the customer of the sorting error. If the errors persist, the collection service shall provide a written notice to the customer.

COMPLIANCE

Failure to comply with this ordinance will result in a notice of violation. If the issues are not addressed, increasing penalties will be applied to the property/business owner or manager.

- First violation- $500 fine.
- Second violation- $1,000 fine.
- Third plus violation- $2,000 fine for each subsequent violation.

EXEMPTIONS

Exemptions from violation for this ordinance may be provided when certain criteria are reached. The criteria are as follows:

1. Significant economic hardship.
2. For commercial businesses that inhabit less than half of a building.
3. Instances in which the recycling and compost of certain types of waste would violate state or federal law.
4. Waste generated is deemed significantly low in quantity/volume.
5. A business follows best practices for disposal of waste by including recycling and compost containers, but still experiences minimal waste cross contamination as a result of customers improperly disposing of waste.

Pay-As-You-Throw (PAYT) Ordinance Template

This template was modeled after the following existing ordinances:

- Fort Collins' "Pay-As-You-Throw" (PAYT) Ordinance, 1996

DEFINITIONS

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

NOTE: For context purposes, definitions reflect the meanings established by the original ordinance that were referenced to create the following model ordinance.

Pay-As-You-Throw (PAYT) means a disposal system in which the price of disposal is determined by the amount of waste that is generated.

PAYT bags means special distinct looking garbage bags that are a part of the PAYT program that must be purchased from approved sellers and must be used to dispose of all non-recyclable or non-compostable waste.

Donate means the act of giving away unneeded items free of charge to those who will use them.

Reuse means utilizing products for another purpose, instead of disposing of them.

Recycle means the disposal of materials in such a way that they can be repurposed into other materials.

Reduce means the process of generating less waste, such as reducing the amount of single-use non-recyclable products purchased.

Waste means materials and substances from human/commercial/industrial/agricultural activities that no longer have a use.

Compost means the disposal of organic materials that have the capability to break down naturally in the environment to produce compost.

Landfill means a site in which waste is taken to be disposed of.

Waste Collection Services means services that collect waste from designated pick-up points.

Source Separation means the process in which recyclables and compostables are separated from waste at the point of generation to reduce the amount of waste disposed in landfills.

ARTICLE 1. PURPOSE

1.1 PURPOSE

The purpose of the PAYT program is to encourage waste generators to reduce the amount of waste produced by charging for the amount of waste disposed of. This method of waste disposal is intended to promote positive environmental and economic change in the community.

APPLICABLE REGULATIONS

- 40 CFR Part 246
- Resource Conservation and Recovery Act

SCOPE

This ordinance applies to the reduction of solid waste by encouraging composting, donating, reducing, reusing, and recycling the appropriate materials.

MONITORING AND ENFORCEMENT

This ordinance does not necessarily enforce recycling, composting, and donation practices. However, it does financially incentivize the utilization of these sustainable alternatives. Waste that is disposed of in unapproved garbage bags or containers will not be collected by waste collection services.

ARTICLE 2. SPECIFICATIONS

APPROVED PAYT BAGS

1. All waste shall be disposed of in approved PAYT garbage bags. These bags must be easily distinguishable to waste collection service workers from traditional garbage bags. Such differences could be a district color or pattern on the PAYT bags.
2. PAYT bags shall be easily accessible to purchase at various local locations. Retailers are permitted to sell these bags, so long as they do not increase the sale price.
3. The price of these bags is dependent on size and quantity. Single small (15 gallon) bags are sold for $.85 and single large (30 gallon) bags are sold for $1.50 can also be sold in packs of five for $4.25 for small bags and $7.50 for large bags.
4. Bags shall not be overstuffed to the point of ripping and must be able to be tied. Overflowing or excessively ripped bags will not be collected.
5. If purchased PAYT bags are found to contain defects that inhibit their ability to properly carry waste, they can be exchanged at an approved bag sale location. Bags that were ripped as a clear result of over-stuffing will not be accepted for exchange.
6. The cost of waste disposal under this program is heavily influenced by the amount of waste generated. The less waste that is disposed of, the less PAYT bags are required to be purchased.

SOURCE SEPARATION

Source separation is highly encouraged and incentivized under PAYT. The more materials that are reduced, reused, recycled, donated or composted, the less bag fees will have to be paid. Waste collection services shall provide separate containers for materials that are compostable and recyclable.

COMPLIANCE

Waste shall be disposed of in the appropriate PAYT garbage bags, or the waste will not be collected. If the uncollected waste remains, it is in violation of Existing County Ordinance X and is subject to penalties associated with noncompliance of said ordinance.

Recycling Infrastructure and Building Design Ordinance Template

This template was modeled after the following existing ordinance:

- North Central Texas Council of Governments, 2009

DEFINITIONS

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

NOTE: For context purposes, definitions reflect the meanings established by the original ordinance that were referenced to create the following model ordinance.

Recycle means the disposal of materials in such a way that they can be repurposed into other materials.

Recycling Infrastructure means infrastructure that supports recycling practices.

Building means an indoor structure that is utilized for residential, commercial, or industrial use.

Compost means the disposal of organic materials that have the capability to break down naturally in the environment to produce compost.

Multi-Family Dwelling means a single building in which multiple separate living units are present. This included duplexes, apartments, and similar buildings.

Single-Family Dwelling means a single building which contains only one living unit.

New Building means a building that must undergo construction and applicable building permits following the adoption of this ordinance.

Existing Building means a building that was already constructed prior to the adoption of this ordinance.

Residential Building means a building which is intended for continuous human occupancy where individuals or families live.

Living Unit means an area in which contains all of the necessities to be considered a living space, including but not limited to a kitchen, bathroom, and area to sleep.

POS System means the point of sale system in which a monetary transaction for goods is completed.

ARTICLE 1. PURPOSE

PURPOSE

The purpose of this ordinance is to encourage an increase in recycling efforts by developing more accessible recycling infrastructure through new building design.

APPLICABLE REGULATIONS

- 2021 International Building Code
- 2021 International Residential Code
- Resource Conservation and Recovery Act

SCOPE

This ordinance provides recycling infrastructure guidelines that are required for the design of new buildings and recommended for existing buildings.

MONITORING AND ENFORCEMENT

This ordinance will be enforced for new building developments as a necessary step in the building permit process. For already existing buildings, adoption of recycling infrastructure is highly recommended, but not required.

ARTICLE 2. REQUIREMENTS BY BUILDING TYPE

RESPONSIBILITY OF NEW BUILDING DEVELOPERS

Residential Single-Family Buildings

1. Recycling infrastructure is highly recommended for new single-family residential buildings but is not required for residential buildings containing less than four living units.
2. Recommended recycling infrastructure for new structures includes at least 2.5 cubic feet of space for waste and 2.5 cubic feet for recyclables in every residential unit.
3. It is recommended that there are waste and recycling containers located in accessible areas of the building.

Residential Multi-Family Buildings

1. Recycling infrastructure is required for new multi-family residential buildings that contain four or more living units.
2. A location to dispose of waste and recycling shall be present and clearly marked on every floor for residential buildings that contain four or more living units.
3. Required recycling infrastructure for new structures includes at least 2.5 cubic feet of space for waste and 2.5 cubic feet for recyclables in every residential unit.
4. The building shall provide an area designated for the separate storage of recyclables and waste while it is awaiting disposal from a waste collection service. This area shall not be in an area of prolonged human habitation.
5. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

Commercial Buildings

1. A location to dispose of waste and recycling shall be present and clearly marked on every floor for commercial buildings that have ten or more employees.
2. The building shall provide an area designated for the separate storage of recyclables and waste while it is awaiting disposal from a waste collection service. This area shall not be in an area of prolonged human habitation.

3. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

Industrial Buildings

1. A location to dispose of waste and recycling shall be present and clearly marked on every floor for industrial buildings that have ten or more employees.
2. The building shall provide an area designated for the separate storage of recyclables and waste while it is awaiting disposal from a waste collection service. This area shall not be in an area of prolonged human habitation.
3. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

RESPONSIBILITY OF EXISTING BUILDING OPERATORS

Residential Single-Family Buildings

1. Recycling infrastructure is highly recommended for existing single-family residential buildings but is not required.
2. Recommended recycling infrastructure for new structures includes at least 2.5 cubic feet of space for waste and 2.5 cubic feet for recyclables in every residential unit.
3. It is recommended that there are waste and recycling containers located in accessible areas of the building.

Residential Multi-Family Buildings

1. Recycling infrastructure is highly recommended for existing multi-family residential buildings.
2. It is recommended that a location to dispose of waste and recycling be present and clearly marked on every floor for residential buildings that contain four or more living units.
3. The building is encouraged to provide an area designated for the separate storage of recyclables and waste while it is awaiting disposal from a waste collection service. This area must not be in an area of prolonged human habitation.
4. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

Commercial Buildings

1. Existing commercial buildings that undergo renovations that equate to a 30 percent addition to square foot value are required to install recycling infrastructure.
2. The building shall provide an area designated for storage of waste while it is awaiting disposal from a waste collection service. This area shall not be in an area of prolonged human habitation. It is encouraged that a separate area for the storage of recyclables is also implemented.
3. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

Industrial Buildings

1. Existing industrial buildings that undergo renovations that equate to a 30 percent addition to square foot value are required to install recycling infrastructure.
2. The building shall provide an area designated for storage of waste while it is awaiting disposal from a waste collection service. This area shall not be in an area of prolonged human habitation.
3. It is encouraged that a separate area for the storage of recyclables is also implemented.
4. Recommended recycling infrastructure for multi-level buildings is the installation of a chute for the easy transport of recyclables to a designated recyclable space.

COMPLIANCE

New building developers shall meet the recycling infrastructure requirements to be eligible for a building permit and certificate of occupancy. Existing buildings will not be penalized for failure to comply.

EXEMPTIONS

- Already existing buildings are not subject to this ordinance.
- Buildings that are greater than 50 percent complete by the time this ordinance is adopted are not subjected to these regulations.
- Residential buildings that contain less than 4 six units.
- Commercial businesses that inhabit less than half of a building.

Single-Use Plastic Bag Tax/ Fee Ordinance Template

This model ordinance focuses specifically on the tax/fee of single-use plastic bags. This format can be modified to apply taxes and fees associated with the use of other materials, as well as a way to provide a more seamless transition for other material bans.

This template was modeled after the following existing ordinance:

- Marin County Ordinance Regulating Retail Establishments Provision of Single-Use Carry-Out Bags
- Ordinance No. 3553

DEFINITIONS

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

NOTE: For context purposes, definitions reflect the meanings established by the original ordinance that were referenced to create the following model ordinance.

Material Definitions – It should be noted that the material being taxed should be clearly defined in this section. For the purpose of this ordinance, terms relating to the use of single use plastic bags will be defined.

Single-Use Plastic Bag means any disposable plastic bag that is provided by retailers or businesses to a customer for the purpose of carrying items.

Single-Use Paper Bag means any disposable paper bag that is provided by retailers or businesses to a customer for the purpose of carrying items.

Customer means anyone who purchases goods at a business.

Restaurant/Takeout Location means any location that sells ready-to-eat food that is prepared on site.

Retail Establishment means a location that sells goods to consumers, including but not limited to groceries, apparel, and household items.

Reusable Bag means a bag that is of good enough quality to be used indefinitely. Can be made of fabric or durable plastic that is at least 2.25 millimeters thick.

POS System means the point of sale system in which a monetary transaction for goods is completed.

FINDINGS

- There are significant environmental impacts associated with the production, distribution, and use of single-use bags.
- Single-use plastic bags are a large contributor to pollution.
- Reusable bags are widely accessible and affordable.

ARTICLE 1. PURPOSE

PURPOSE

The purpose of this ordinance is to discourage the distribution and use of single-use plastic bags provided by retail establishments by applying a mandatory tax/fee per bag used, in appropriate situations.

APPLICABLE REGULATIONS

- Resource Conservation and Recovery Act
- 35 ILCS 120/1

SCOPE

This ordinance applies to the distribution and use of single-use plastic bags provided by retailers and other businesses.

MONITORING AND ENFORCEMENT

1. Adequate financial records shall be kept of all transactions including single-use plastic fees.
2. These records shall detail the number of bags used in total, how much money was paid in fees, and the amount of the bag fee that is kept by the retail establishment.
3. Bag charges shall be present on the customers' receipt, and present in the point of sale (POS) system. If no such system is utilized, manual records shall be kept.
4. This ordinance is enforced by the City Manager.
5. Retailer establishments shall report their records on a quarterly basis.
6. In cases where bag fee exemptions apply, while no fee is paid, the amount of bags used and the applicable exemption shall still be recorded.

ARTICLE 2. REQUIREMENTS

MANDATORY BAG FEE

Retail establishments are required to charge a fee of $0.10 per plastic bag that is given to customers.

FEES ASSOCIATED WITH ALTERNATE BAGS

Other single-use bags such as paper bags are also subject to bag fees of $0.10 per bag. This is done in an attempt to reduce the amount of unsustainable plastic alternatives that are used, and encourage the use of reusable bags.

UTILIZATION OF FEES

1. Dispersion of bag fee revenue of $0.02 of every $0.10 is allocated to the retailer or business that is distributing the bags.
2. These funds are intended to offset the price of the necessary changes the retailer must make, such as changes to POS systems to include the option of bag fees, the training of employees, and necessary bag fee signage.
3. The remaining $0.08 cents is allocated to [insert municipality] and is considered a tax. The revenue from this tax is used exclusively to fund local sustainability and resiliency improvement projects.

APPROVED BAGS

1. Customers are encouraged to bring their own reusable bags when buying merchandise.
2. Customers are permitted to bring whatever bags they wish, even if they are single-use plastic bags or paper bags.

RETAIL ESTABLISHMENT REQUIREMENTS

1. Retail establishments shall give warning of changes to bag use policy at least 60 days prior to the enactment of the bag fees.
2. Signage clearly stating the bag fee policy shall be located at every POS station and in clear sight to customers.
3. Retail establishments are required to provide reusable bags, either for sale or free of charge to the customer.
4. Retail establishments shall also permit the use of reusable bags, and are prohibited from banning them from their establishments. See exemptions.

COMPLIANCE

Retailers and businesses are subject to fines for instances of noncompliance.

- First violation – Written notice of violation.
- Second violation – $100.00 fine.
- Third violation- $200.00 fine.
- Fourth and subsequent violations - $500.00 fine per violation.

Failure of a retail establishment to keep adequate records of single-use bag distribution will result in a violation and a fine based on their past records will be estimated and must be paid.

EXEMPTIONS

1. Restaurants and takeout establishments are not required to charge a bag fee as reusable bags may not be suitable for the transport of cooked food.
2. Plastic bags with the purpose of carrying produce, meat, and pharmaceuticals, and are exempt as they could contaminate other items and reusable bags.
3. Dry cleaning and newspaper paper bags are permitted as they protect these objects.
4. During a major health crisis, some retail establishments may choose to ban the use of reusable bags for employee safety, unless a self-checkout is utilized.
5. Customers who receive government assistance to purchase food products are not required to pay bag fees.

Single-Use Plastic Bag Ban Ordinance Template

This model ordinance focuses specifically on the ban of single-use disposable plastic bags This format can be modified to apply taxes and fees associated with the use of other materials, as well as a way to provide a more seamless transition for other material bans.

This template was modeled after the following existing ordinance:

- Marin County Ordinance Regulating Retail Establishments Provision of Single-Use Carry-Out Bags
- Ordinance No. 3553

DEFINITIONS

The following words, terms, and phrases, when used in this chapter, shall have the meanings ascribed to them in this section, except where the context clearly indicates a different meaning.

NOTE: For context purposes, definitions reflect the meanings established by the original ordinance that were referenced to create the following model ordinance.

Material Definitions – It should be noted that the material being taxed should be clearly defined in this section. For the purpose of this ordinance, terms relating to the use of single use plastic bags will be defined.

Single-Use Plastic Bag means any disposable plastic bag that is provided by retailers or businesses to a customer for the purpose of carrying items.

Single-Use Paper Bag means any disposable paper bag that is provided by retailers or businesses to a customer for the purpose of carrying items.

Customer means anyone who purchases goods at a business.

Restaurant/Takeout Location means any location that sells ready-to-eat food that is prepared on site.

Retail Establishment means a location that sells goods to consumers, including but not limited to groceries, apparel, and household items.

Reusable Bag means a bag that is of good enough quality to be used multiple times. Can be made of fabric or durable plastic that is at least 2.25 millimeters thick.

POS System means the point of sale system in which a monetary transaction for goods is completed.

FINDINGS

- There are significant environmental impacts associated with the production, distribution, and use of single-use bags.
- Single-use plastic bags are a large contributor to pollution.
- Reusable bags are widely accessible and affordable.

ARTICLE 1. PURPOSE

PURPOSE

The purpose of this ordinance is to discourage the distribution and use of single-use plastic bags by enacting a ban on them, except for certain appropriate circumstances.

APPLICABLE REGULATIONS

- Resource Conservation and Recovery Act
- 35 ILCS 120/1

SCOPE

This ordinance applies to the distribution and use of single-use plastic bags provided by retail establishments.

MONITORING AND ENFORCEMENT

1. This ordinance is enforced by the City Manager.
2. Retailer establishments must report their records on a quarterly basis for alternate bags distributed.

ARTICLE 2. REQUIREMENTS

MANDATORY SINGLE-USE PLASTIC BAG BAN

Retail establishments are prohibited from distributing single-use plastic bags to customers at checkout.

FEES ASSOCIATED WITH ALTERNATE BAGS

Other single-use bags such as paper bags are subject to bag fees of $0.10 per bag. This is done in an attempt to reduce the amount of unsustainable plastic alternatives such as paper bags that are used and encourage the use of reusable bags.

UTILIZATION OF ALTERNATE BAG FEES

Dispersion of alternate bag fee revenue of $0.02 of every $0.10 is allocated to the retailer or business that is distributing the bags. These funds are intended to offset the price of the necessary changes the retailer must make, such as changes to POS systems to include the option of alternate bag fees, the training of employees, and necessary bag fee signage.

The remaining $0.08 cents is allocated to the [insert municipality] and is considered a tax. The revenue from this tax is used exclusively to fund local sustainability and resiliency improvement projects.

APPROVED BAGS

1. Customers are encouraged to bring their own reusable bags when buying merchandise.
2. Customers are permitted to bring whatever bags they wish, even if they are single-use plastic bags or paper bags.

RETAIL ESTABLISHMENT REQUIREMENTS

1. Retail establishments must give ample warning of changes to bag use policy prior to the enactment of the bag fees.
2. Signage clearly stating the bag fee policy must be located at every POS station and in clear sight to customers.
3. Retail establishments are required to provide reusable bags, either for sale or free of charge to the customer.
4. Retail establishments must also permit the use of reusable bags and are prohibited from banning them from their establishments. See exemptions.

COMPLIANCE

Retailers and businesses are subject to fines for instances of noncompliance.

- First violation – Written notice of violation.
- Second violation – $100.00 fine.
- Third violation- $200.00 fine.
- Fourth and subsequent violations - $500.00 fine per violation.

EXEMPTIONS

1. Restaurants and takeout establishments are not impacted by this ban, as reusable bags may not be suitable for the transport of cooked food.
2. Plastic bags with the purpose of carrying produce, meat, and pharmaceuticals, and are exempt as they could contaminate other items and reusable bags.
3. Dry cleaning and newspaper paper bags are permitted as they protect these objects.
4. During a major health crisis, some retail establishments may choose to ban the use of reusable bags for employee safety, unless a self-checkout is utilized.

Appendix D: Acronyms & Glossary

Acronyms

A

AD: Anaerobic Digestion

B

BCCD: Boone County Conservation District

BTU: British Thermal Unit

C

C&D: Construction & demolition

CDBG: Community Development Block Grant

CED: Covered Electronic Device

CERA: Consumer Electronic Recycling Act

CERCLA: Comprehensive Environmental Response Liability and Compensation Act

CFL: Compact Fluorescent Light

CFR: Code of Federal Regulations

CH 4: Methane

CHP: Combined Heat and Power

CII: Commercial, Industrial, and Institutional

CNG: Compressed Natural Gas

CO2: Carbon Dioxide

CPS: Collaborative Problem-Solving

E

EE: Environmental Education

EJ: Environmental Justice

EPA: Environmental Protection Agency

EPRRA: Electronic Products Recycling and Reuse Act

EREF: Environmental Research & Education Foundation

EV: Electric Vehicle

F

FRSA: Four Rivers Sanitation Authority

FTE: Full-time equivalent job

G

GCS: Gas Collection System

GHG: Greenhouse Gases

GSA: U.S. General Services Administration

H

HHW: Household Hazardous Waste

I

IEPA Illinois Environmental Protection Agency

IFSC: Illinois Food Scrap Coalition

IGA: Illinois General Assembly

IHE: Institutions of Higher Education

ILCSWMA: Illinois Counties Solid Waste Management Association

ILPSC: Illinois Product Stewardship Council

IPCB: Illinois Pollution Control Board

IRF: Illinois Recycling Foundation

K

KNIB: Keep Northern Illinois Beautiful

L

LCFS: Low Carbon Fuel Standards

LFG: Landfill Gases

M

MMAC: Materials Management Advisory Committee

MMBTU: Millions of BTUs

MMU: Materials Management Unit

MPG: Multipurpose Grants

MRF: Material Recovery Facility

MSW: Municipal Solid Waste

N

NEETP: National Environmental Education and Training Program

NLI: Natural Land Institute

NSCEP: National Service Center for Environmental Publications

NW: Northwestern

O

ORCR: Office of Resource Conservation and Recovery

P

P2: Pollution Prevention

PAYT: Pay-As-You-Throw

PCF: Pollution Control Facility

PFAS: Per- and Polyfluoroalkyl Substances

PFOA: Perfluorooctanoic Acid

PFOS: Perfluorooctane Sulfonate

PRSC: Paper Recovery Service Corp

R

RCRA: Resource Conservation and Recovery Act

REMI: Regional Economic Models Inc.

RFS: Renewable Fuel Standards

RIN: Renewable Identification Numbers

RNG: Renewable Natural Gas

S

SCARCE: School & Community Assistance for Recycling and Composting Education

SGA: Seven Generations Ahead

SMM: Sustainable Materials Management

SWALCO: Solid Waste Agency of Lake County, IL

SWANA-IL: Illinois Chapter of the Solid Waste Association of North America

SWCD: Soil & Water Conservation Districts

SWDA: Solid Waste Disposal Act

SWMA: Solid Waste Management Act

SWMRA: Solid Waste Management and Recycling Act

SWPRA: Solid Waste Planning and Recycling Act

T

TSD: Treatment, Storage and Disposal Facility

U

UIC: University of Illinois Chicago

V

VOCs: Volatile Organic Compounds

W

WARM: Waste Reduction Model

WFAA: Wasted Food Action Alliance

WTE: Waste-to-Energy

Y

YMCA: Young Men's Christian Association

Glossary of Terms

A

Aerobic Oxidation

Aerobic oxidation is a type of cellular respiration. Aerobic respiration undergoes by utilizing oxygen in many cells. In this type of oxidation, carbon dioxide and adenosine triphosphate (ATP) are released as by-products.

Source: Walsh Medical Media

Anaerobic Digester

The closed anaerobic environment in which anaerobic digestion takes place.

Source: U.S. Environmental Protection Agency

Anaerobic Digestion

Anaerobic digestion is a process through which bacteria break down organic matter—such as animal manure, wastewater biosolids, and food wastes—in the absence of oxygen.

Source: U.S Environmental Protection Agency

Anthropogenic

Environmental change caused or influenced by people, either directly or indirectly.

Source: United States Geological Survey

B

Bioaccumulation

The accumulation over time of a substance and especially a contaminant (such as a pesticide or heavy metal) in a living organism.

Source: U.S. Environmental Protection Agency

Biogas

Anaerobic digestion produces two valuable outputs: biogas and digestate. Biogas is composed of methane (CH_4), which is the primary component of natural gas, at a relatively high percentage (50 to 75 percent), carbon dioxide (CO2), hydrogen sulfide (H2S), water vapor, and trace amounts of other gases. The energy in biogas can be used like natural gas to provide heat, generate electricity, and power cooling systems, among other uses. Biogas can also be purified by removing the inert or low-value constituents (CO2, water, H2S, etc.) to generate renewable natural gas (RNG).

Source: U.S. Environmental Protection Agency

Biomass

Biomass is renewable organic material that comes from plants and animals.

Source: U.S. Environmental Protection Agency

Bioplastics

The term "bioplastics" is used to describe both fossil fuel-derived plastics that are biodegradable (they break down to some level at some point in time- up to thousands of years), and biomass or renewable resource-derived plastics (termed bio-based plastics).

Source: U.S. Environmental Protection Agency

Biosolid Fertilizer

Biosolids are a product of the wastewater treatment process. During wastewater treatment, the liquids are separated from the solids. Those solids are then treated physically and chemically to produce a semisolid, nutrient-rich product known as biosolids. The terms 'biosolids' and 'sewage sludge' are often used interchangeably. Land application of biosolids also can have economic and waste management benefits such as a reduced demand for synthetic fertilizers.

Source: U.S. Environmental Protection Agency

Bottle Bill

The term "bottle bill" is actually another way of saying "container deposit law." A container deposit law requires a minimum refundable deposit on beer, soft drink, and other beverage containers in order to ensure a high rate of recycling or reuse.

Source: National Conference of State Legislatures

C

Capital Costs

The costs associated with the initial landfill construction, including land, engineering and infrastructure and excluding the cost of WTE additions.

Source: National Renewable Energy Laboratory

Catalytic Converters

Catalytic converters, installed on vehicles with internal combustion and diesel engines, convert the toxic byproducts of combustion to less toxic compounds.

Source: Merriam-Webster Dictionary

Circular Economy

An economy that uses a systems-focused approach and involves industrial processes and economic activities that are restorative or regenerative by design, enable resources used in such processes and activities to maintain their highest value for as long as possible, and aim for the elimination of waste through the superior design of materials, products, and systems (including business models).

Source: U.S. Environmental Protection Agency

Combustion

Combustion, also known as mass burning, is the process of burning MSW in a combustion chamber with the presence of excess air. This process is the most common waste-to-energy method used partly due to its low maintenance requirements. Incinerators are often used to combust waste, but this technology can produce toxic chemicals, such as carbon monoxide, that pollute the air.

Source: U.S. Environmental Protection Agency

Compost Product

The final product that is produced from a composting facility or the composted digestate from an AD facility.

Source: U.S. Environmental Protection Agency

Corrosive

Causes damage by chemical action.

Source: U.S. Environmental Protection Agency

D

Digestate

Anaerobic digestion produces two valuable outputs: biogas and digestate. Digestate is the residual material left after the digestion process. It is composed of liquid and solid portions.

Source: U.S. Environmental Protection Agency

Dual-Stream Recycling

Dual-stream recycling separates the waste into two streams — fibers and containers — by using both manual sorting and automated equipment.

Source: U.S. Environmental Protection Agency

E

End-of-Pipe

Practices that promote waste pre-processing prior to disposal through chemical treatment, recycling, and burning.

Source: IGI Global

Environmental Justice

Environmental justice (EJ) is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations and policies.

Source: U.S. Environmental Protection Agency

F

Feedstock

Raw material used in the production of goods.

Source: U.S. Environmental Protection Agency

Ferrous

Containing or relating to iron.

Source: Cambridge Dictionary

G

Gasification

Gasification is the complex process of converting household waste into substances rich in carbon, like char and synthetic gas. This process requires a high level of maintenance to be performed correctly and efficiently. On the other hand, it requires little to no fuel demand and emits little air pollution, making it an attractive option.

Source: Office of Energy Efficiency & Renewable Energy

Goodness-of-Fit

The conformity between an experimental result and theoretical expectation or between data and an approximating curve.

Source: Merriam-Webster Dictionary

H

Holistic

Dealing with or treating the whole of something or someone and not just a part.

Source: Cambridge Dictionary

I

Impervious

Incapable of being penetrated: a material impervious to water.

Source: U.S. Environmental Protection Agency

L

LCFS Profits

The Low Carbon Fuel Standard is a program by the State of California that awards credits to facilities that have waste-to-energy pathways that produce vehicle fuel that has a lower carbon intensity than standard fuel. Facilities outside of California can still be awarded these credits if the fuel that they produced is used in California.

Source: U.S. Environmental Protection Agency

Leachate

Leachate is formed when rain water filters through wastes placed in a landfill. When this liquid comes in contact with buried wastes, it leaches, or draws out, chemicals or constituents from those wastes.

Source: U.S. Environmental Protection Agency

Linear Economy

An economic model based on the sequence take (raw material), make (products), use (consume), dispose (of non-recyclable waste), which has demonstrated to be unsustainable for both its resources consumption and its environmental impact.

Source: IGI Global

M

Mitigate

To make something less harmful, unpleasant, or bad.

Source: Cambridge Dictionary

Mixed Waste Recycling

Mixed waste recycling separates recyclable materials from waste and then continues separating the recyclables, making it the most tech-oriented method of these options.

Source: Cleanup News

Multicollinearity

The existence of such a high degree of correlation between supposedly independent variables being used to estimate a dependent variable that the contribution of each independent variable to variation in the dependent variable cannot be determined.

Source: Merriam-Webster Dictionary

Municipal Solid Waste

Municipal solid waste is a mixture of energy-rich materials such as paper, plastics, yard waste, and products made from wood. The definition excludes waste from municipal sewage networks and treatment, as well as waste from construction and demolition activities.

Source: U.S. Energy Information Administration

N

Net Present Value

The sum of the costs and revenue in which cost is negative and profit is positive. This is expressed in dollars per ton of waste in this document.

Source: National Renewable Energy Laboratory

O

Operation and Maintenance Costs

The costs associated with operating a facility excluding the cost of waste-to-energy systems. This includes factors such as labor, fuel and repair costs.

Source: National Renewable Energy Laboratory

Organic Waste

Biodegradable waste originating from plants or animals (food waste, paper, yard trimmings, etc.).

Source: U.S. Environmental Protection Agency

P

Product Capital Costs

The cost of any additional investments needed for waste-to-energy projects. This value will vary depending on the waste-to-energy system utilized.

Source: National Renewable Energy Laboratory

Product Operation and Maintenance Costs

The costs associated with operating the waste-to-energy systems only. This includes factors such as labor, fuel, and repair specifically to the waste-to-energy systems.

Source: National Renewable Energy Laboratory

Product Profits

Refers to the profit that is earned from the various waste-to-energy pathways. This can include but is not limited to profits from the sale of electricity to the grid and the sale of CNG.

Source: National Renewable Energy Laboratory

Pyrolysis

Pyrolysis is the process of exposing waste to extremely high temperatures in order to create biofuel. While this process may sound similar to incineration, pyrolysis is performed in the absence of air and generates less dioxins, making it a cleaner method.

Source: U.S. Environmental Protection Agency

R

Reactive

Likelihood of a substance to undergo chemical change.

Source: U.S. Environmental Protection Agency

REC Profits

Renewable Energy Credits are earned by waste-to-energy pathways that produce electricity and are awarded per kWh of energy generated.

Source: U.S. Environmental Protection Agency

Remediation

The process of improving or correcting a situation.

Source: Cambridge Dictionary

RIN Profits

Renewable Identification Numbers are profits specific to waste-to-energy pathways that produce fuel for vehicles.

Source: U.S. Environmental Protection Agency

S

Scalability

The ability of a business or system to grow larger.

Source: Cambridge Dictionary

Sewage Sludge

The solid, semisolid, or liquid untreated residue generated during the treatment of domestic sewage.

Source: U.S. Environmental Protection Agency

Single-Stream Recycling

Single stream recycling is similar to dual-stream except the recyclables are not separated, so higher technology is required to separate them at the beginning of the process.

Source: U.S. Environmental Protection Agency

Social Vulnerability

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health.

Source: Centers for Disease Control and Prevention

Soil Amendment

Materials added to soil to improve its physical properties.

Source: U.S. Environmental Protection Agency

Solar Radiation

Solar radiation, often called the solar resource or just sunlight, is a general term for the electromagnetic radiation emitted by the sun. Solar radiation can be captured and turned into useful forms of energy, such as heat and electricity, using a variety of technologies. However, the technical feasibility and economical operation of these technologies at a specific location depends on the available solar resource.

Source: Office of Energy Efficiency & Renewable Energy

Source Reduction

Source reduction, also known as waste prevention, means reducing waste at the source, and is the most environmentally preferred strategy. It can take many different forms, including reusing or donating items, buying in bulk, reducing packaging, redesigning products, and reducing toxicity. Source reduction also is important in manufacturing. Lightweighting of packaging, reuse, and remanufacturing are all becoming more popular business trends.

Source: U.S. Environmental Protection Agency

Source Separation

Manual sorting at curbs of recycled materials that require less attention, such as glass, paper, and plastic.

Source: U.S. Environmental Protection Agency

Stewardship

Care or management.

Source: Cambridge Dictionary

Stratified

Arranged in separate layers.

Source: Cambridge Dictionary

Superfund Sites

Thousands of contaminated sites exist nationally due to hazardous waste being dumped, left out in the open, or otherwise improperly managed. These sites include manufacturing facilities, processing plants, landfills and mining sites.

Source: U.S. Environmental Protection Agency

T

Tipping Fee

A dollar per ton fee that a waste facility charges users to dispose of waste. These have conventionally been the main way landfills and other waste management facilities offset their capital and operating costs.

Source: National Renewable Energy Laboratory

Total Solid Waste

Residential, commercial, industrial, and landscape wastes and sewage sludge.

Source: Boone and Winnebago County Waste Plans

Toxic

Poisonous, or relating to poisonous substances.

Source: Cambridge Dictionary

W

Waste Diversion

For waste measurement purposes, diversion is any combination of waste prevention (source reduction), recycling, reuse and composting activities that reduces waste.

Source: CalRecycle

Waste Infrastructure

The basic structure of waste disposal, recycling, or composting, such as “waste sorting and treatment facilities, landfills, bins, dumpsters, trucks, and transfer stations”.

Source: Cambridge Dictionary

Waste Stream Audits

An analysis of the types, quantities, and location of waste generated, usually performed by sorting through trash.

Source: The Solid Waste Authority of Central Ohio

Waste-to-Energy

Waste-to-Energy plants burn municipal solid waste (MSW), often called garbage or trash, to produce steam in a boiler that is used to generate electricity.

Source: Energy Information Administration

Appendix E: Public Survey, Comments & Data Methodology

Public Survey

As a key component of the Regional Solid Waste Management Plan, a public outreach survey was conducted for residents of Boone and Winnebago Counties. The goal of the survey was to collect further insight about current waste management practices, disposal accessibility, and local public opinion regarding solid waste and the regional solid waste management system. These results helped identify pressure points and areas of improvement in the regional solid waste system. The survey was open to the public for approximately 30 days. In this time, 106 individuals took the survey, answering a total of 27 questions.

NOTE: The opinions expressed in this survey are not representative of both counties as a whole, but merely a small percentage of those who chose to complete the survey. This data is also subject to rounding errors as a result of multiple-choice formatting. Thus, some questions will have a total percentage above 100 percent.

Key Findings

- A majority of respondents (70%) recycle most of the time.
- The three most common recycling methods are curbside recycling, yard waste collection, and private facility drop-off.
- Barriers to recycling include cost, convenience, and lack of education or access. The following results support this finding.
- Survey data indicated 29% of respondents were not familiar with drop-off recycling centers near them.
- Results showed 34% of respondents claim to receive no resources related to waste management program information.
- Misconceptions about recycling can impact an individual's motivation to recycle. Moreover, 13% of respondents claim they do not recycle and are not interested in recycling.

Summary

The survey results indicate a lack of knowledge regarding recycling methods. Curbside recycling was the method people were most familiar with, while less than a third of respondents claimed they had no experience with drop-off centers. Additionally, there is unfamiliarity with used tire and household battery recycling, bulky item disposal, and composting in the area. Over a third of those also reported inexperience with household hazardous waste disposal services.

Overall, there is confusion regarding the disposal of traditional and non-traditional materials, recycling locations, and the success rate of recycling. This contributes to incorrect source separation and a lack of recycling altogether. This confusion may be attributed to a lack of accessible waste management programs and resources for residents. Over a third of respondents claimed their households do not receive any educational resources, and those that did most frequently received it from the county website, print media, and/or utility bills.

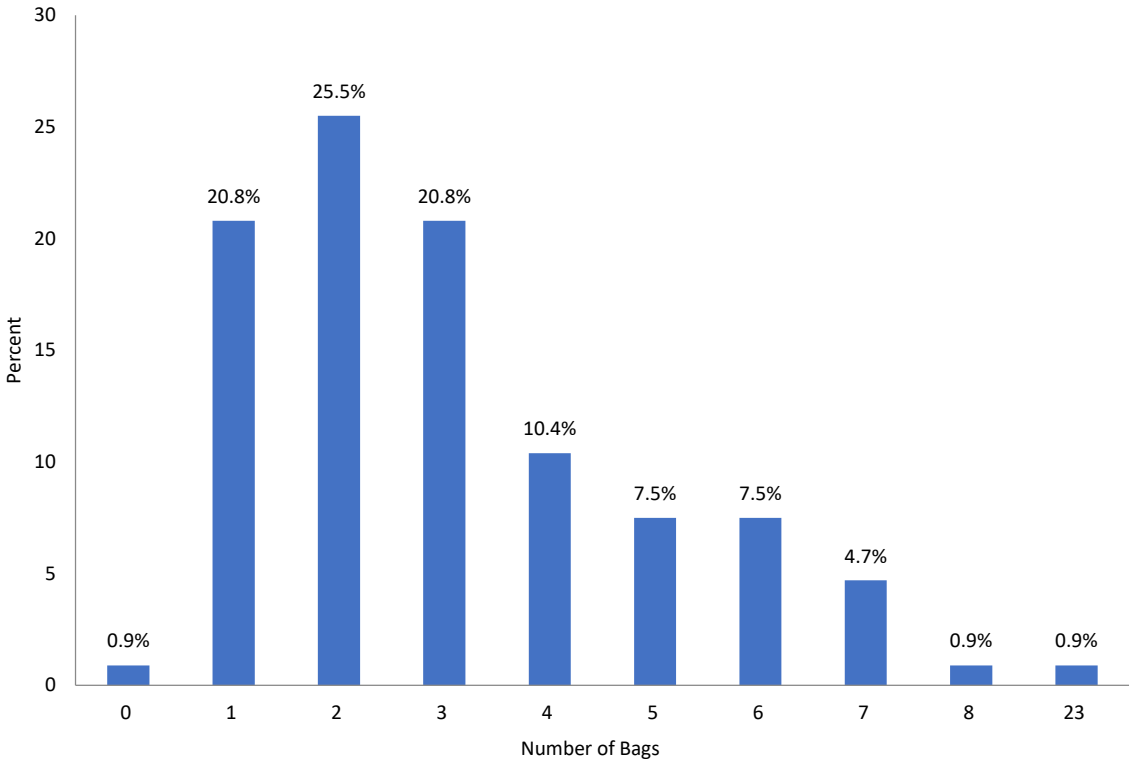
Many respondents stated they would like to see recycling programs expanded for composting, household hazardous waste, and electronics. Another highly recommended request was the inclusion of more curbside recycling for less conventional recyclables in place of drop-off centers.

Concerns related to the local waste system's infrastructure included noxious odors purported to originate from the Winnebago Landfill, landfill expansions, environment-specific health issues, property values, drinking water contamination, hauler truck traffic, and waste falling off of waste transporter trucks and into the street.

Public Survey Responses

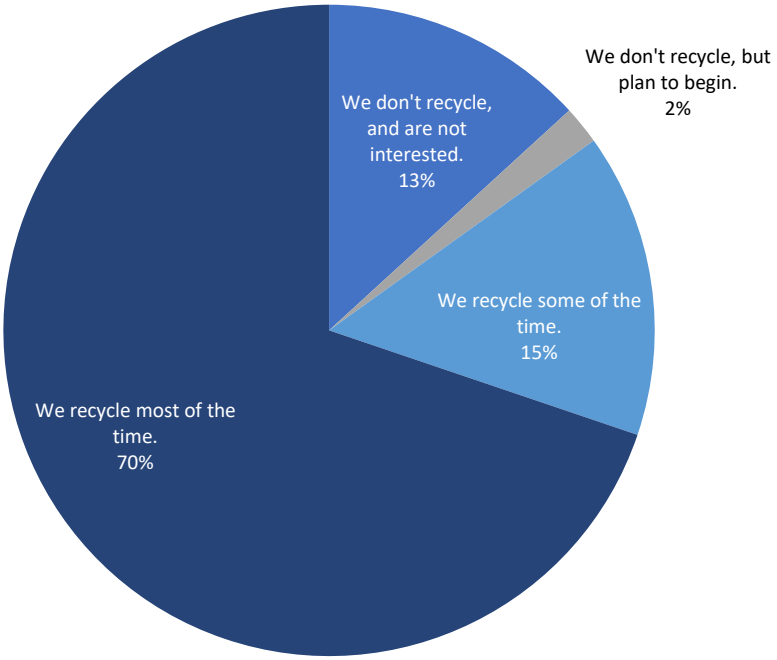
1. On average, your household produces how many medium-sized garbage bags for collection each week?

Figure E-1. Number of Garbage Bags Produced Each Week



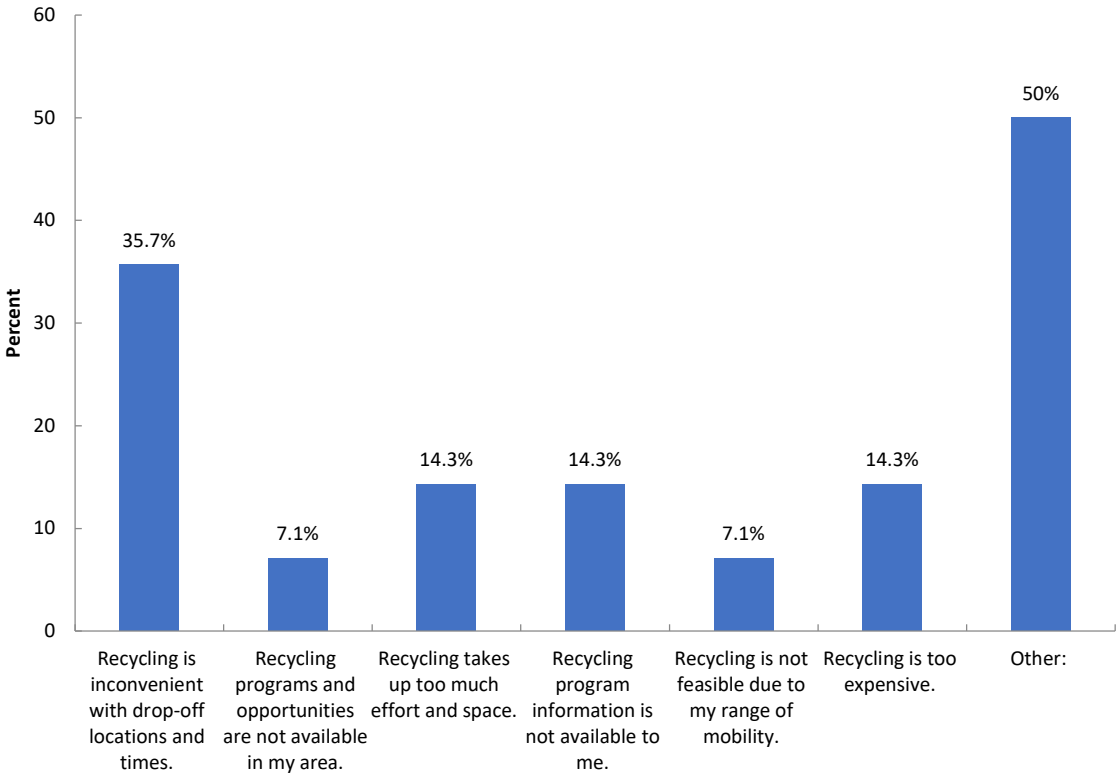
2. How much emphasis does your household place on recycling?

Figure E-2. Emphasis on Recycling



3. What barriers do you have to recycling? (Check all that apply)

Figure E-3. Barriers to Recycling



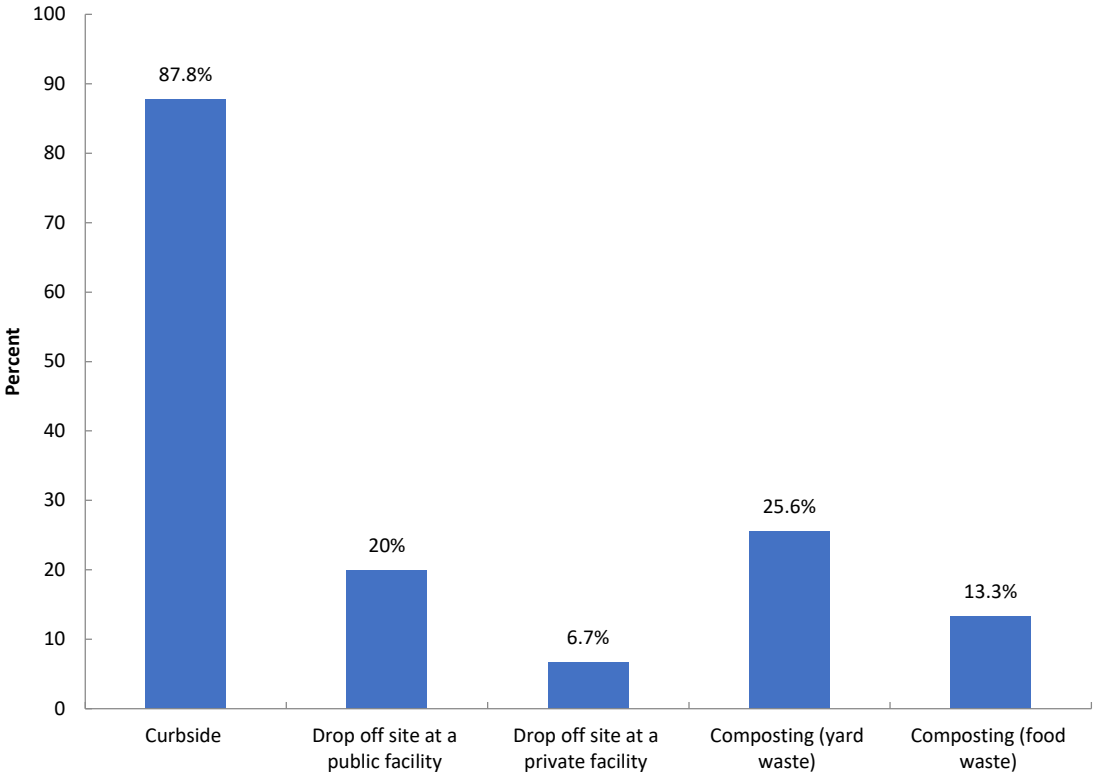
4. What made you decide to start recycling? (Check all that apply)

Table E-1. Recycling Reasons Explained

Winnebago County does not provide recycling pickup.
Other; (blank)

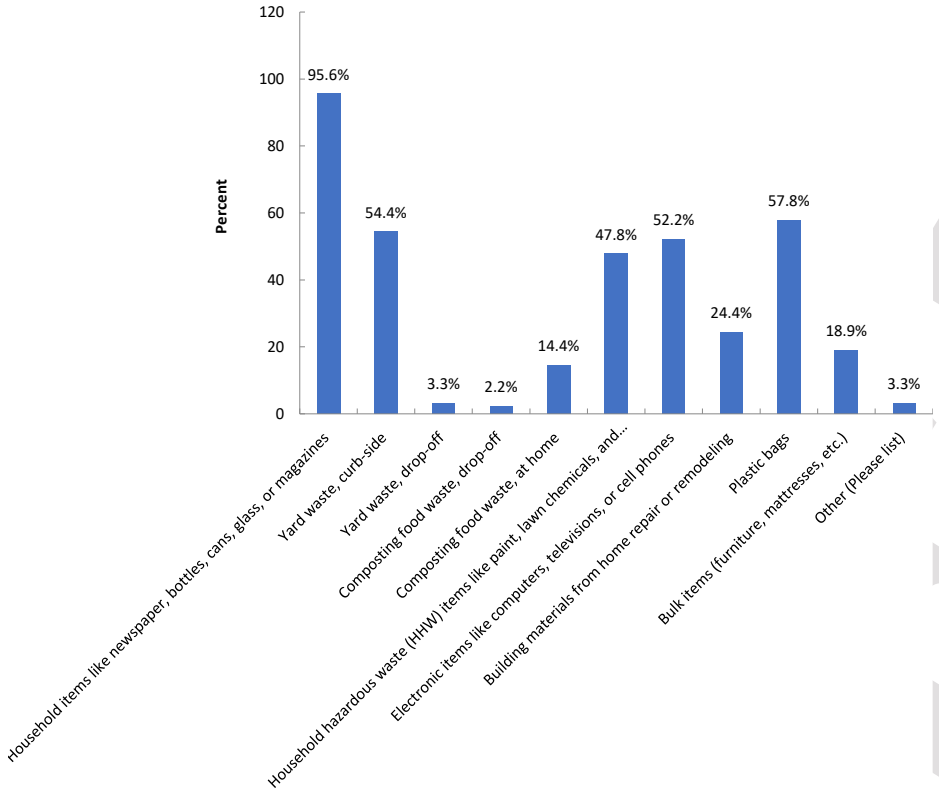
5. How do you currently recycle? (Check all that apply)

Figure E-4. Recycling Methods Utilized



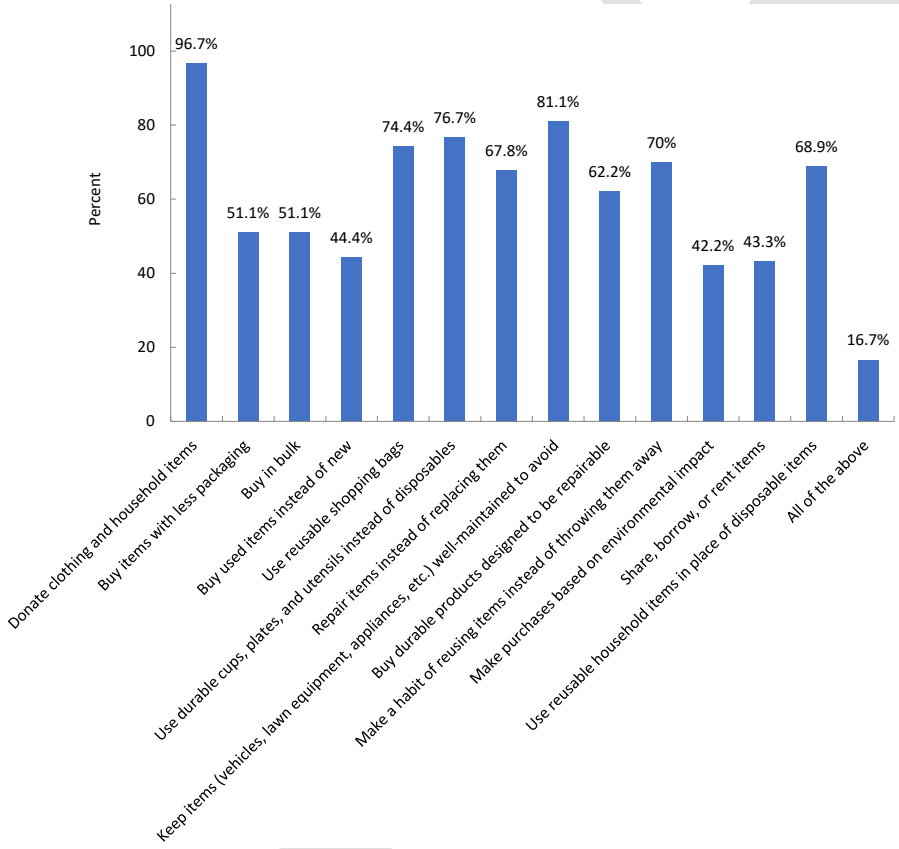
6. Which of the following materials does your household recycle (either curb-side or at a drop-off facility)? (Check all that apply)

Figure E-5. Materials Frequently Recycled



7. Which of the following materials does your household recycle (either curb-side or at dropoff facility?

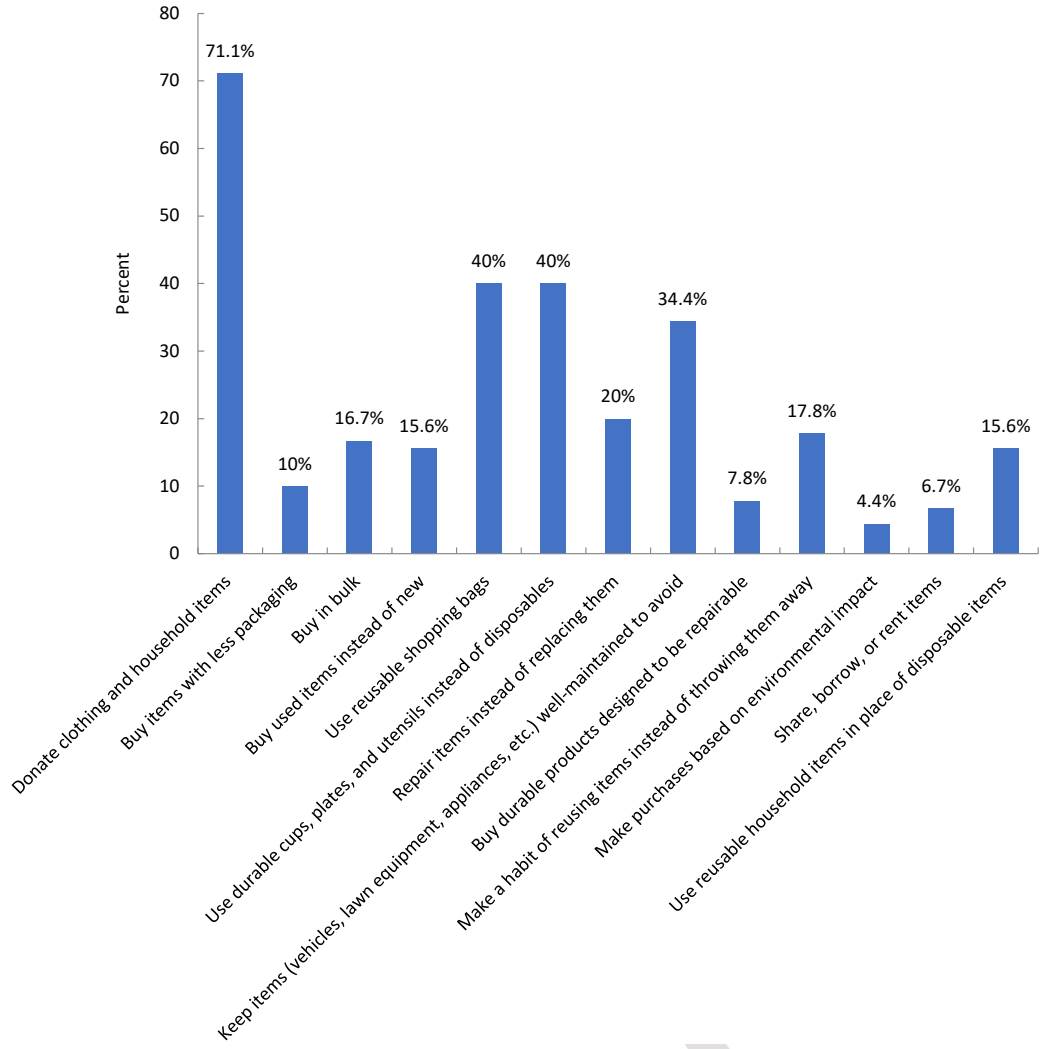
Figure E-6. Waste Reduction Practices



8. Do you or other members of your household currently do any of the following to reduce the amount of trash you throw away?

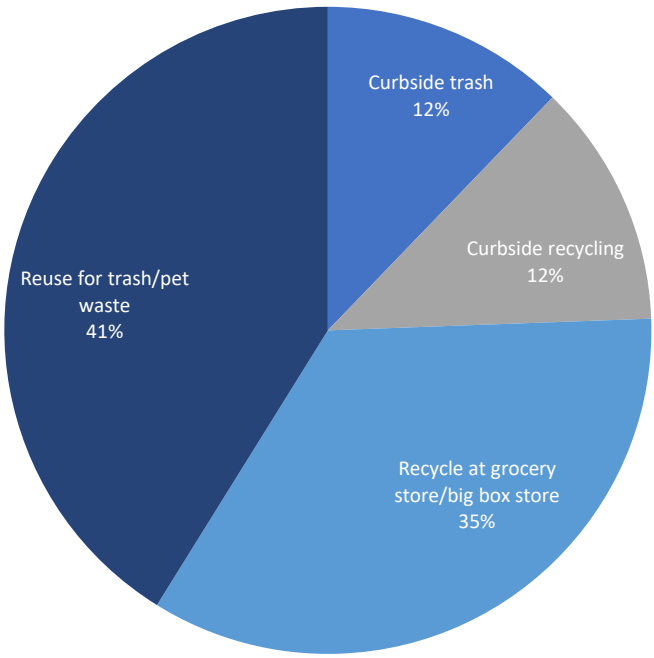
9. What top three activities from the previous question do you do most frequently?

Figure E-7. Most Utilized Waste Reduction Practices



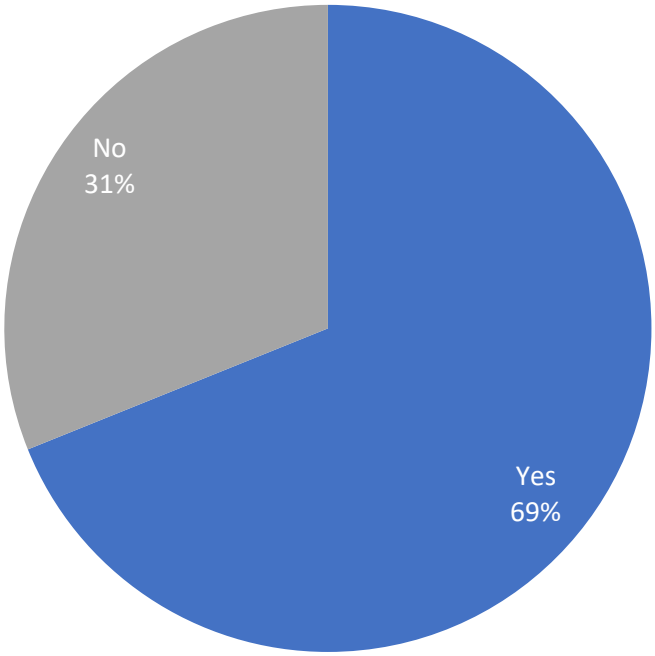
10. How do you manage plastic shopping bags at your home?

Figure E-8. Plastic Bag Disposal



11. Are you recycling more than you did 5 years ago?

Figure E-9. Recycling Now versus 5 Years Ago



12. Please Explain.

Table E-2. Explanation for Responses of Additional Services Offered

I believe plastic recycling is actually harming our environment by using Cargo Barges to transfer plastics over oceans only to be sent back. It seems we uselessly use fossil fuels to move recyclables across the globe with actually no recycling done.
We recycle more items than we used to.
Actually I have found that some of the items that I used to think we're recyclable are not. So maybe I'm recycling less but I still recycle everything that can be recycled.
Recycling same as we did 5 years ago. There's only 2 of us in the house and we don't buy or use more than we did
Electronic items. I used to just throw them in the trash. Now I put broken items in a bin and take them to public recycling events. I also buy more items from thrift stores and garage sales rather than buying new
We donate a lot to good will and save all our cans.
Less acceptable
Wish my recycle container was bigger. Have more recycle than garbage.
We make an effort to recycle all we can
I have more people living with me.
I recycle my cans for years and been recycling plastic, glass, cardboard for years with curbside and once in a white broken furniture.
There are more items purchased that are packaged in recyclable materials. Also, glad to be aware of more recycling sites for electronic devices and household chemicals.
Much less just recently. Realized much or most of my plastics weren't actually getting recycled. Witnessed my recycle truck guy taking my garbage also (clearly garbage in garbage bags). If he's throwing used cat litter in with the recyclables, none of it is going to be recycled since it will be contaminated and filthy. I was spending way too much time cleaning everything and sorting, just to find him doing that.
More aware of the impact- so making more of an effort to recycle. But our recycle can is much smaller than our 2 garbage cans. And recycle pick up is only every other week.
Space constraints
More conscious
More aware but upset when we recycle only to see it dumped in with the normal trash at pickup
We've always been recycling advocates way beyond the 5 years you've mentioned.
More Amazon purchases with more cardboard boxes to recycle.
I recycle the most items of anyone in my neighborhood. I also take items to KNIB and to the place off Kishwaukee for oil paints and tires. I think people should be fined for not recycling.
With exception to items collected curbside, we have used other resources for recycling like plastic bag drop-off bins.

I've always brought recycling home from school or work if it wasn't available there. Now just from my household, we fill a bin per day most days and then I have to drive it somewhere. Very grateful for organizations such as Keep IL Clean and Beautiful and I give the rest to my parents to put out with theirs because they have curbside pickup and I do not.

Recycling habits haven't changed in 5 years.

We have always been big on recycling as much as we can.

I question each item that goes in the regular trash and try to recycle it.

Seems self explanatory

Same

We donate, reuse, and recycle as much as we can as our kids get older and want to do the same.

limited in previous location

City switched to larger recycling container

We recycle plastic bags more often.

My recycling rate has been higher for more than 5 years

Being more cognizant of the waste produced.

We have always recycled.

I have been recycling as much as I can for at least 10 years.

Harder to recycle here than where I came from

We make sure to recycle anything we can.

We have fewer household members so the volume is somewhat less; otherwise, we have recycled to the maximum extent possible for more than 20 years

We started recycling a few years ago due to a recycling initiative at my son's school. We placed recycling bins in a more accessible area of our garage.

Household has always made recycling a top priority.

We moved to new home; before the garage was not attached but now it is. We have placed recycle container inside the garage right at the door that opens to kitchen and toss recyclables like bottles, boxes, glass etc... Kids also help to remind; they are better at it.

We recycle everything that we can

No change

More conscious of items that can be recycled rather than throw away. I also donate a lot of items.

I recycle a little more than 5 years ago.

electronic waste now has an outlet at KNIB. Egg cartons are now reused at KNIB. Canvas bags are again accepted at a few places, but not overall. Very disappointed in that.

I become more aware of its importance

We simple more aware. . .

More materials have become recyclable and so our recycling has increased. We are very diligent about doing so.

More cognizant

Same

Volume of items is more

WE are trying to buy things that don't come in plastic. We are buying refillable containers. We try to keep things in good repair. We reuse things we used to toss.

I did know exactly what could be recycled

In Rockton it has become more convenient to recycle with curbside recycling.

We have been recycling to this extent for the last 17 years (when we moved out on our own).

We have more items to recycle than 5 years ago. We have been recycling for 40 years. Our son was in the first recycling TV commercial 35 years ago promoting Recycling in Rockford.

reuse plastic bags

We recycle as much as possible because we have watched the countryside, just south of us, become a mountain of trash in just a few years. Very sad.

Have always recycled

Very mindful of what we put into a landfill to help protect our environment and wildlife

Used to burn paper. Now recycle the paper.

by reducing our garbage hoping we can stop/slow expansion of the 2 landfills that are kitty corner from each other.

Maybe not. A lot of the items I thought were recyclable are not.

They are making less and less items eligible for recycle

Ever since curbside became a thing I have been recycling paper, plastic and aluminum. Before that it had been just cans, but that was already 10 years ago.

Using reusable shopping bags, composting food scraps, repairing items instead of scrapping then

Moved into an area with recycling opportunities

I am more aware than years past.

Take to store more often

We recycle about the same and in the same ways.
I have always recycled everything.
I've always saved cans and done the above things.
Aware of environment more.
I did not have access to curbside recycling five years ago, so I didn't recycle.
I have recycled for over 5 years.
We have curb side pickup for recyclables
I have just been paying more attention to it
Far more conscious of the waste, so tend to recycle more items,
No
More things get recycled than trash we produce. Older & more aware of environmental toxins & damage!
Family has grown and so has the number of items we recycle.
Recycling partially increased due to increase in online shopping
The volume of single-use plastics has increased in the last five years.
Where I lived five years ago did not have opportunities for as much recycling. (Glass and several plastics were not recyclable in my state)
I have always prioritized recycling, my rate remains steady

13. Please rate your familiarity with the following services in the community where you live.

Figure E-10. Familiarity with Curb Side Recycling

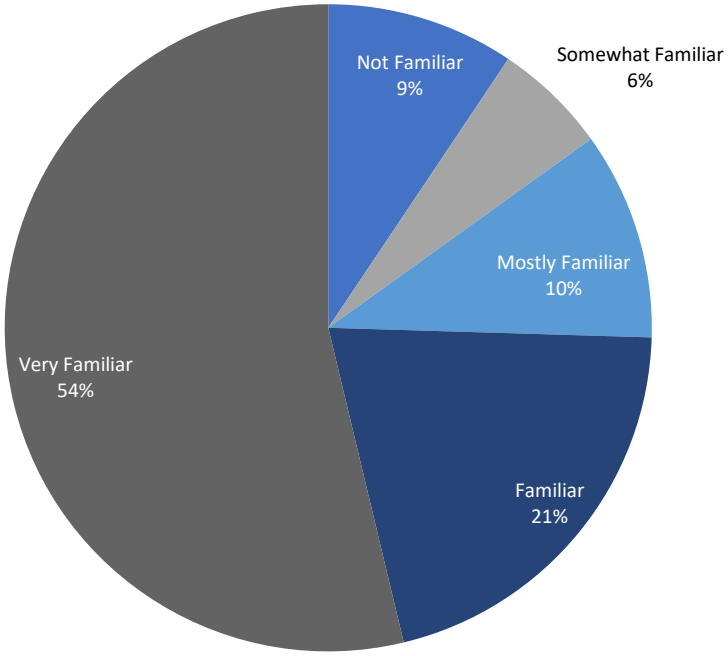


Figure E-11. Familiarity with Recycling Drop-off Centers

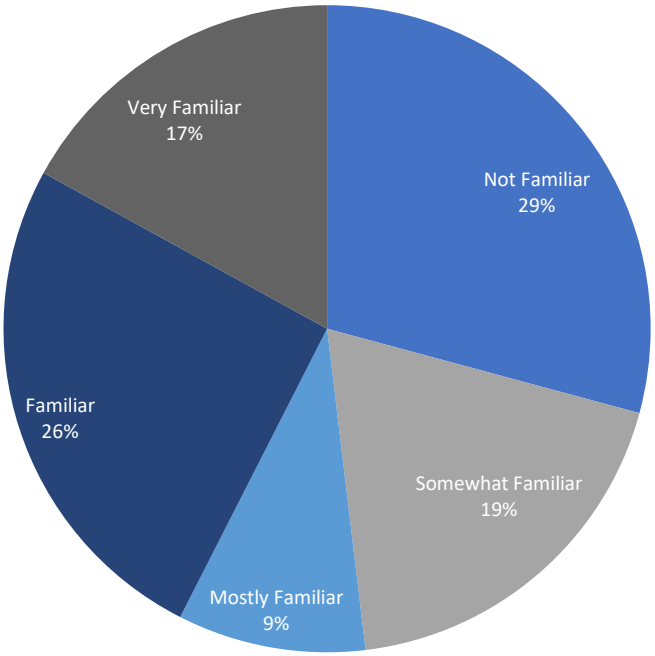


Figure E-12. Familiarity with Yard Waste Collection

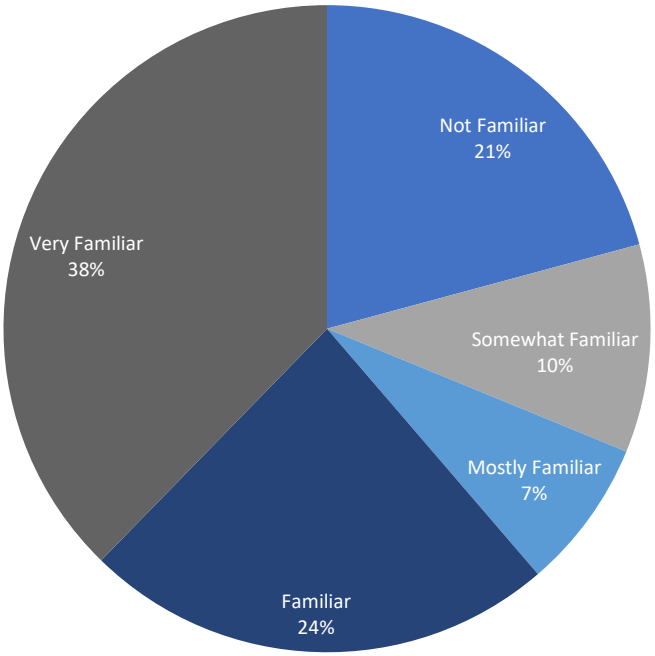


Figure E-13. Familiarity with Household Hazardous Waste Collection Services

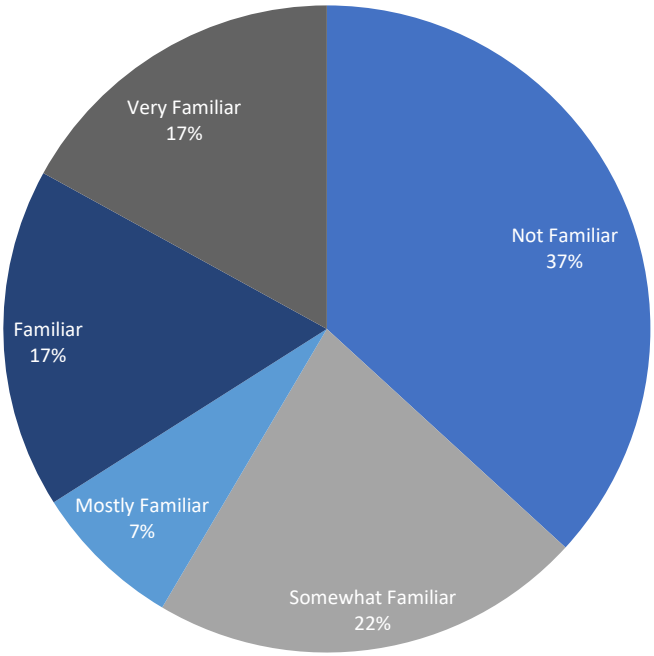


Figure E-14. Familiarity with Used Tire Disposal

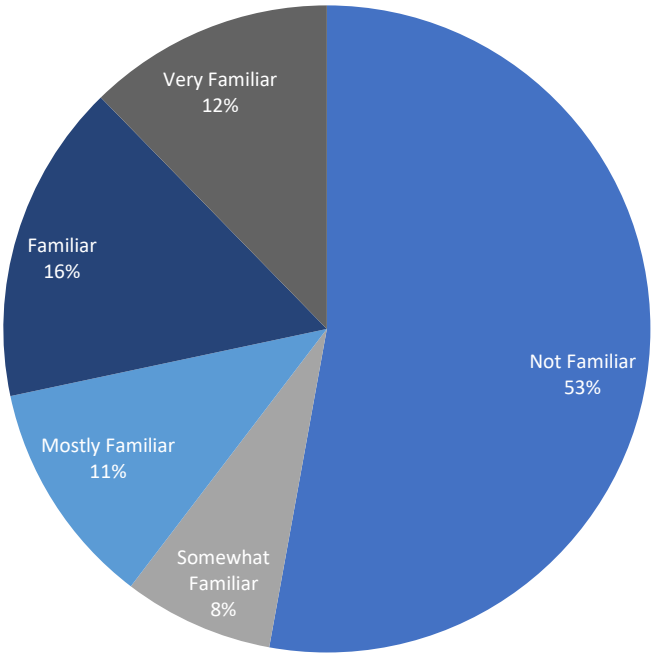


Figure E-15. Familiarity with Bulky Item Pick-up

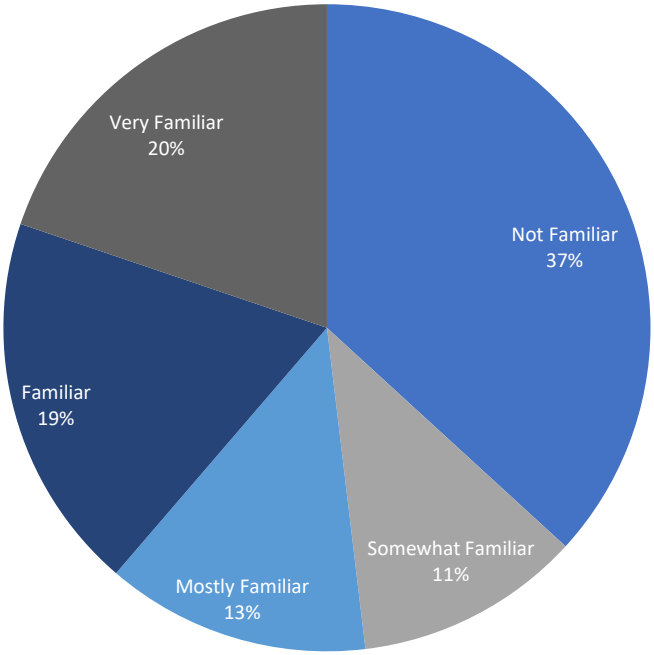


Figure E-16. Familiarity with Household Battery Recycling

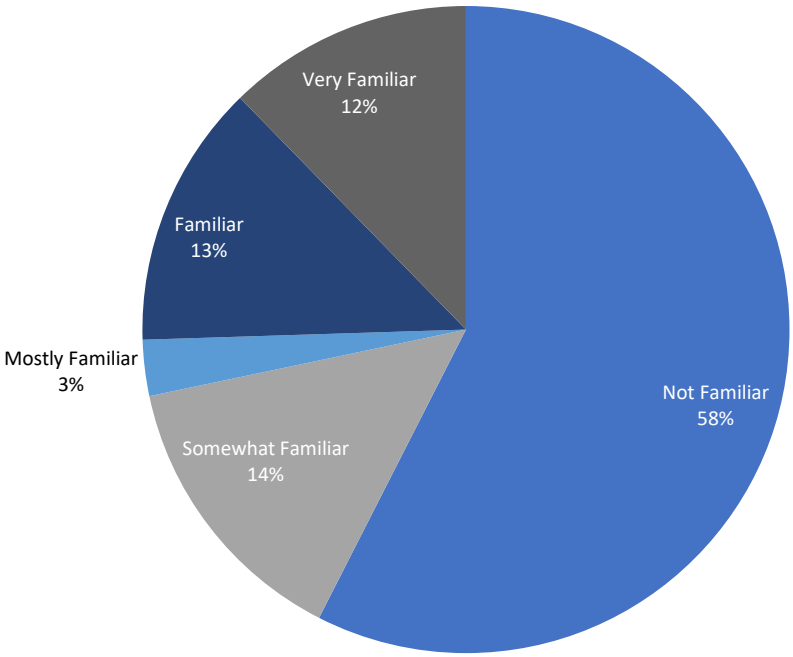
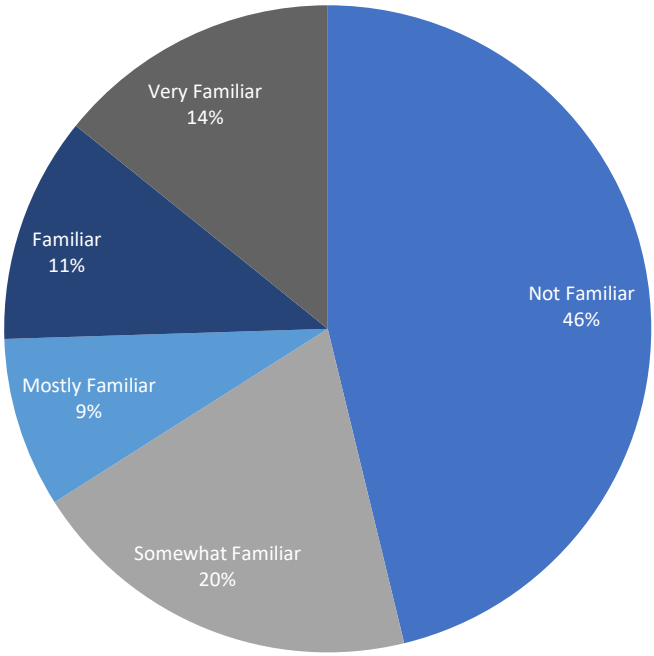


Figure E-17. Familiarity with Composting Services (at home or drop-off)



14. What additional waste or recycling services would you like to see offered or expanded in your community?

Table E-3. Responses of Additional Services

Battery recycling from home
Community recycling Byron lost their station
Curbside or drop off composting
Drop off sites for tires, batteries, and plastics
E Waste Drop Off
Easier access to recycling of non household items
Electronic waste collection
Electronics
Electronics recycling
For Winnebago County to have recycle bins and the Garbage trucks to pick them up. Currently not offered in County.
Free Electronic Recycling
Household batteries recycling, composting
Household Hazardous Waste
Household battery recycling.
I want puck up for recycling at my location
I would like to see my apartment be required to provide recycling services
Larger recycle cans or pick up weekly for recycling
Magazines
More options to recycle tires
More places to buy reasonably priced previously owned items
Municipal composting, County passing a plastic bag ban.
We pay for our trash pick up and don't have access to much recycling.
When I tried to recycle batteries locally, I was told that I should just throw them out.
battery and hazardous waste pick up
composting
composting; textile recycling

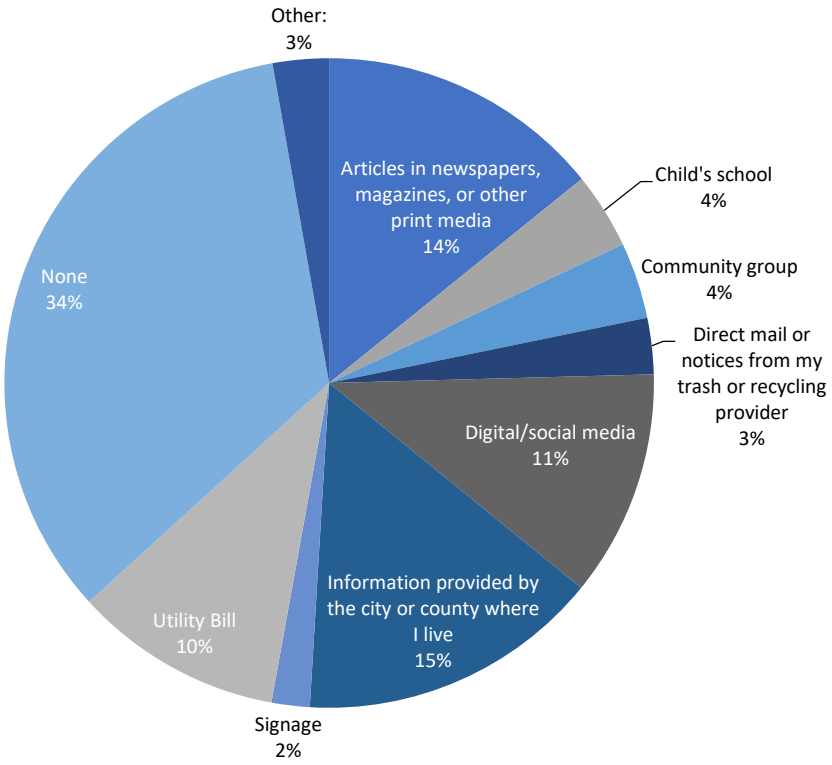
cost efficient recycling
education on recycling (many people I talk to don't think it is worth it or that it is actually recycled, also I see many people put their recycled goods in plastic bags for roadside pick up)
electronic collection, tv, computer
electronic recycling
electronics
electronics recycling
electronics recycling and battery recycling
fdgh
food disposal/composting
household batteries AAA etc
pick up of appliances
plastic bag recycling
recycle large appliances
recycling opportunities for apartments

Table E-4. Responses of Additional Services Explained Further

Actually make the garbage companies recycle the recyclable material.
Battery and plastic bag collection
Bulk item pick up (designated dates). Hazardous waste recycle.
Construction materials disposal
Electronic waste collection
Electronics recycling
Household Hazardous Waste (improved advertising/communication)
Information as to locations & hrs to be readily available
Information on what my disposal company recycles. It is difficult to find on their website. Hazardous waste site in Boone. We currently go to Rockford.
Larger recycling bins provided for curbside
Make it simple
Paint disposal
Tires/Bulk disposal awareness
Tv battery pick up
Would like to see more than just basic recycling offered. Things people dont know what to do with
Would like to try the composting service
acceptable curbside items expanded
curbside
curbside recycling (items actually get processed and recycled at waste facility), and improved plastic bag recycling options. More frequent and accessible tire and battery and hazardous waste disposal opportunities. Incentivizing biodegradable bag use, fully recyclable waste containers when they reach end of useful life.
hazardous waste and electronic waste collection/recycling.
larger curbside recycling bins
on-street leaf pickup in the fall
road side pick up to more areas and recycling for businesses
toxic waste disposal
yard waste

15. What types of resources does your household currently receive related to waste management programs?

Figure E-18. Current Waste Management Resources Recieved



16. What are your thoughts on your area's current waste management practices or haulers?

Table E-5. Respondents Thoughts on Current Waste Management Practices and Haulers

I don't recycle because I think it's all going into the landfill anyway
My Driver is outstanding. The Haulers brining in trash from outside my area tend to lose garbage from their trucks. The landfill is filling our area with outside garbage creating extensive truck traffic in addition to failing to control toxic gas release into our community from excessive mountains of decaying garbage.
Open top haulers need to ensure their net/cover is being utilized to prevent trash being blown out of their truck and we need to stop trucking in trash from Chicago.
I don't really have any complaints. I just wish more things were recyclable. And be picked them up from the house or have a drop-off not just on certain days and time. Anytime drop off
Not good. We are still frequently smelling landfill gases at and inside our home, though not quite as intense as previously. I have told friends looking to but a house to look outside our area because of the landfills. Haulers are still an issue as well, have to be extra careful near the landfills so we don't get creamed by one leaving the site.
THE DUMP SMELLS HORRIBLY! I live by it and some days I literally gag. Too many out of area trucks come here to dump stuff. Why? These trucks drip liquids and stuff blows off of them. Why?
To expensive
The garbage trucks leave a mess because they are over filled. Trash flies out everywhere.
Not aware that our hauler offers any type of recycling program.
Management of the landfill is horrible. Smells are often present over 5 miles away from the dump to the point our children are unable to play outside and we are unable to enjoy being outside.
You don't want to know
Like rock river but need bigger recycle containers.
Not sure. Waste haulers drive too fast on roads
Haulers won't pick up recycling and sometimes don't take all of the trash.
Stop talking garbage from outside Boone and Winnebago county. Stop trying to make a profit off of trash! Make the landfills follow the laws and stop polluting our air and waterways. Stop putting dollars over your residents.
None
none
I'm not happy with the constant barrage of trucks through our neighborhood and roads spewing trash from their over filled trucks. The drivers also drive over the speed limit and aren't courteous to others driving on the road . My biggest concern however, is the stench that has invaded our lovely countryside from the mountains of trash filling our landfill all for a few million dollars. Such a tragedy to lose our pristine land for tons of garbage and a scarce amount of money, especially when you consider the cost for cleaning the air and rising respiratory health concerns. The logic of that deal never made sense to me!
Not sure I trust them anymore. Have not been able to come up with a reasonable explanation of why the recycle guy would take a black plastic garbage bag filled with garbage. And sometimes they miss a pick-up and I have to call them. Then they may or may not come back out. I called them two days in a row earlier this summer, but they still never showed up.

Need weekly pick up for recycling

A more transparent and competitive structure of hauler contract services would help.

A lot of debris flies off both the trucks for Winnebago LF & DJ Orchard View. The cost to pick up the litter by the County is a wash for what revenues it takes in. Then there is the clear EPA violation of 2 of IL. Larger Landfills kitty corner from each other polluting not only the Air Quality on a regular basis. This affects the Respiratory health of the towns & subdivisions that are under 5 miles away. The Davis Junction Orchard View LF trenched a ditch for drainage run off from the landfill that empties into Kilbuck Creek direct! And yet somehow Winnebago City Health & Ogle County Health Depts., EPA look the other way & continue the expansion of both Landfills! How is making these Landfills bigger making it any safer for the surrounding residents?!

N/s

Does not comply well

Do a better job of letting the customer know exactly what plastics are/are not recyclable. The recycle containers may say plastics 1 thru 7 but some brochures may mention certain items within that group that are not recyclable.

Competitive market in my location so I can choose hauler. MDC collects my house currently and does a good job.

There is still too much trash along the highways of all of our counties. People toss TVs, mattresses and other large items in fields and waterways. There should be higher fines for littering!

recycling efficiency needs to improve. More education as it relates to acceptable items. A local materials recovery facility would also help reduce carbon footprint by reducing transportation of items.

Good service do not like the odors from the landfill nor the littering off of some of the trucks I

Pick up yard waste

Recycling should be mandatory. Winnebago county should do more Recycling with all of the garbage coming in from Chicago.

It is terrible. It doesn't exist at my address.

The City of Rockford does a great job. No limits on yard waste, trash, etc. I do believe that there needs to be better information about the household hazardous waste center on Kishwaukee St. I found old and conflicting information online. KNIB does a wonderful job of getting the world out about their electronics recycling.

I think overall it is done well, there are some places where waste gets left behind defeating the purpose.

I have MDC. They are very good. However, the redundancy in having so many companies is not good environmentally. Same routes. At least five different trucks each week,if you include recycling pick ups, doing the same job.

Pretty good

Need to be more aggressive in preventing litter from escaping trucks

Our trash and recycling pickup service is efficient.

they are selective with bulk items

We have good waste services, curbside recycling, and HHW drop-off. We do not have adequate electronic recycling or battery recycling

I can't think of anything specific.

could be improved

Not much information provided on what places collect or dispose of certain material

pleased

No opinion

There is a monopoly with only a few large waste haulers. I signed up for curbside pickup when I moved to Rockford and then found out they do not recycle so now I have to deliver my recyclables myself.

It's hard to recycle in multi-family housing, especially when public recycling services are very limited outside the 9-5 timeframe. It's almost impossible to compost.

I haven't had any problems with our current waste management provider.

The amount of waste brought in from Chicago and surrounding areas appears to be tremendous and that is a concern

Efficient and timely

.

Need to have Recycle bins and pick up in the County. We are Euclid Ave in Rockford, considered county but no library services or recycling.

Our haulers are great, they come early/on time and grab quickly and efficiently. As for local practices, I would like to see what can be recycled expanded- or maybe there is a lot that can be recycled but homeowners don't know exactly what/how. I would like more information shared about local composting options, as well.

It seems monopolized.

they do great work

The garbage trucks and semis coming in from Chicago leave garbage all over the place on Baxter Rd, I-39, and Hwy 251. It's really sad that our the Mountain of garbage at the dump site was allowed to build up higher than the lay of the land surrounding it, it is a huge eyesore.

There is always trash left from the haulers on the streets that we have to pick up after.

None

no issues.

None

Overall, good. .

I have nothing negative to say. I believe our haulers do a fine job.

We have a positive attitude

Very satisfied.

They need improvement. I don't even think what I recycle actually gets recycled. We should be more like Portland or Seattle.

We have curbside recycling but I would like to see a report on what actually gets recycled when I gets hauled away.

Pretty good

WE need county-wide recycling services.

NO thoughts

I think that they are doing a great job

Rockton's service provider has been very good

I love it!

I think they do a great job but I wonder how much goes into the landfill that should not.

Burying our trash is archaic. Sweden has a far more advanced system that we should be emulating. I've seen it first hand. They burn it with no emissions and produce heating and power for their communities. They have been doing it for over 40 years.

messy inconsistent pick up damage to our cans that they will not replace

Why does Winnebago County take so much waste from other counties?

There is too much brought in from outside our community. Haulers are very dangerous they are in a hurry. They lose trash on the road. They abuse our roadways with heavy loads. The stink from the dump is very offensive. Killbuck creek will run brown and foamy from their discharge. The bird attraction to the dump could be a grave danger to the flights from the airport that is near by.

It's disgusting! The stench, the massive number of trucks. No regard for the people that live in this area. Winnebago County should be ashamed of what is happening here! Nothing is done to clean up this mess and protect tax paying home owners.

Nearby landfills are growing too big and taking on too much waste from outside our community resulting in bad smelling air and potential health risks and environmental damage.

The landfill should not be expanded again.

I have no complaints with service pick up in my area. I have a problem with all the other countries hauling there trucks to the dumps in my area. We have no idea what toxic things they may be dumping. They leave the roads covered in muck and litter. The bigger the dump, the more smell and toxic air we have to breathe.

sloppy

I think Rock river disposal needs to provide larger recycling containers.

Waste management practices are not up to par. If you lived by the landfills you would know that! Very toxic smells with certain weather conditions. Yeah haulers are not respectful of other traffic on the road.

I do not trust the management to run the system properly.

We have had to call, our alley was forgotten twice last month.

It's terrible on 11th street near dump. Trucks pull right out in front of you.

I am happy with the services provided however the cost for the services is a concern as they continue to increase.

Not enough promotion or education on what's available and when.

we need them

I feel they are profession workers and always seem to pick up at the same time, which I really like.

Needs to be expanded for county residents

I have heard from several people that have been at the landfill dumping yard waste, that recycled items are being dumped in the landfill by the contractors that pick up recycling from our homes. I have never witnessed this myself because I have never went to the landfill.

Subpar. Not very good. I don't believe our waste is being recycled. Garbage trucks contribute most of the trash along our roadways. Very disappointed in our waste removal

I live in the County, I can Smell the Land Fill quite a lot, and when you drive down 251 south and Baxter Rd it is a mess, lots of GARBAGE flying out of garbage trucks

Not enough publicity leads to misinformation

Okay

Don't like the fact that "garbage" trucks are picking up recycling. I have also seen garbage trucks dump garbage & recycling in the same truck!

Unsure

Generally fairly positive

Not very good garbage all over and am Bering gassed to death with landfill odors

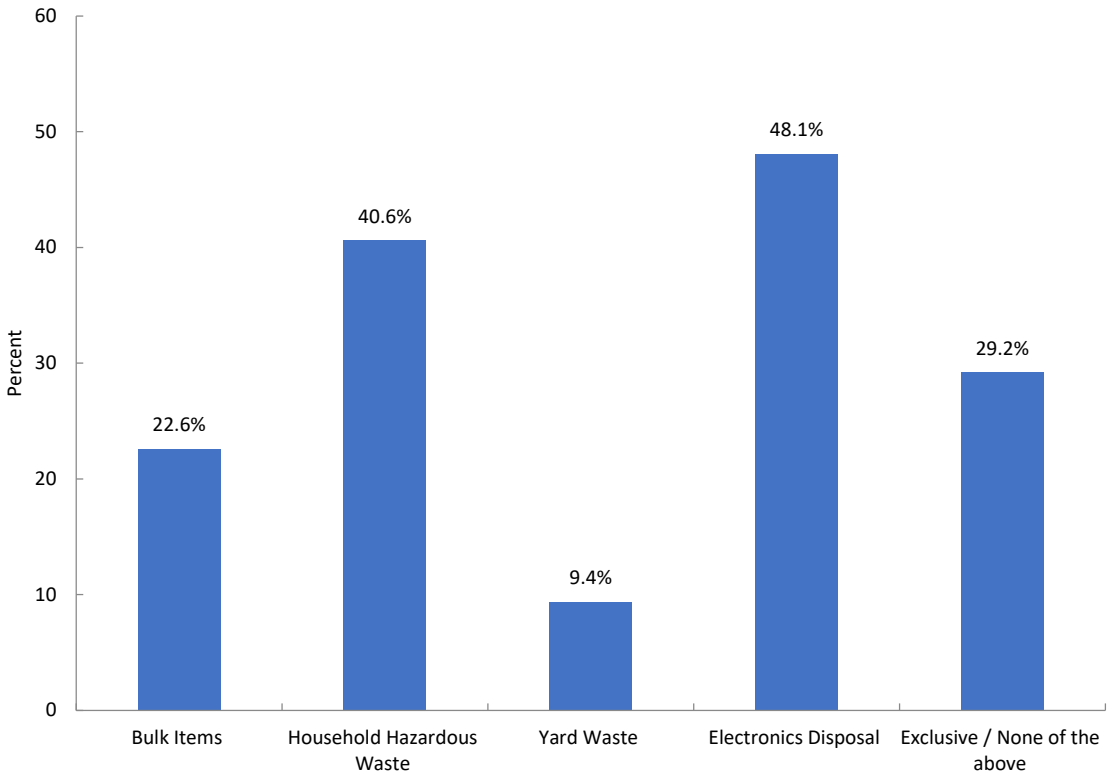
n/a

It's odd that my neighborhood has so many different hauler options, I hear trash pick up nearly every day of the week-all different companies

Information difficult to find. REPEATED OFFGASSING ISSUES, RESULTING IN ODOR PERMEATING CITY FROM LANDFILLS. Lack of transparency regarding actual recycling completed once it leaves our home. Poor billing practices (for example, if I put out an extra bin and they count it once, they keep counting and charging for the extra bin disposal even though it is not used other weeks or months, resulting in overcharging. Difficult to reach and address overcharge, and refusal to correct billing for prior overcharging).

17. Please check the boxes for any items that you have issues with disposing.

Figure E-19. Reported Difficult to Dispose of Items



18. Please explain the issues with disposing of certain waste types.

Table E-6. Respondents Explanation of Difficult to Dispose of Items

I've been meaning to take old paint and varnish to the Saturday drop off for 15 years. Now I have so much it's a daunting task.
I do not know where to dispose of them.
It's not well known where to dispose these things
It's hard when there's only specific dates and times to drop off. It'd be nice if there was a location and a drop box that you can just put it at any time of the day or night oh, any day of the week.
It's very hard to know where or when collecting of electronic items is. We have so many big screen TVs, laptops and other electronic items that can't be fixed. We need a place to drop them off that is available several days a week year around
The company we are with does not offer any type of yard waste or recycling pickup.
Trash has no pick up of large items.
Not known
Not conveniently located
They are too picky about the way you dispose of it.
the cost we already pay a bill. we can't afford added programs that will cost us to pay more. the money not there.
Times! Frequency and locations change without notice. Permanent sites and times would certainly help.
Unfamiliar with how to dispose of them properly
I called all around to find out where to take old paint or solvents too. Never got a answer that panned out to be real.
Bed items
Not enough drop off areas
Unclear where to dispose of these items now that the E-Waste bins at the gas stations have been removed.
There should be a place to dispose of refrigerators and freezers. KNIB only takes TV and computer monitors for a fee.
M
Where can they be disposed at? Why doesn't a city as big as Rockford have a place for disposing of needles / medical waste?????
oil, paint, etc. Where can I take it??
See above.
There is usually a charge involved, finding the location on the City Website is more challenging as well.
Getting to a place that takes these items in time frame they are open
Limited hours for drop off
It would be convenient to have battery disposal each month.

what happens to it?
Lack of available resources
I'm not sure what to do with old paint.
limited options
Not sure where to dispose of certain hazardous waste
not sure where to take
Knowing when and where I can drop them off at or what my municipality has for programming.
Paid large sum of money to have sofa picked up. Sofa ready on curb for 2 weeks before scheduled pick up. Day of pick up Called right away as someone had adopted the sofa. I was STILL charged for a pick up that never happened and no re-imbursement. I had to pre pay to have the pick up. Glorious waste of my money and great for your pockets. No service done yet you got paid. Home owner is a Veteran, no discounts.
I don't know where or how to dispose of certain types of waste.
having to load in car and drop of. Also, I head there is now a charge for large electronics (computers, tv, stereos, microwaves etc..)
Hours are not convenient and there are fees
Where is the location
Not sure where to bring large electronics anymore. Used to bring to Mobil on south main because there was a truck
items like motor oil, paint, stains are difficult to drop off at the limited hours they have
The hours they are open are not convenient.
We have no idea where to dispose of them, we receive no information from our waste management company.
They don't all go to the same place
I live in rural Winnebago county in Durand so the household hazardous waste is all the way in the South Rockford.
Would rather recycle than throw away batteries. Having an option to recycle TVs, etc. curbside would be helpful as it's hard to coordinate otherwise.
We need to know how to get large items, hazardous items, etc. picked up.
not sure where to take them
Not sure exactly where to dispose of hazardous waste
I don't know how to recycle bulk items that are not suitable for donation.
Oil. Not sure how to dispose of it.
Finding locations
paint they leave grass 1/2 time leave may get next week tv wont pick up
Electronics- Finding a location to take them.
No idea after calls to the village of where to take such items too.
Not as simple as other states offer
The dates and times are have to remember or the location is hard to get to.
Not available
I haven't educated myself of the subjects enough. Some material on those issues would be great.
Don't know how to get rid of them. Not enough recycling dates
Electronic devices are not picked up and cost us to drop off.
Don't have any info
Bulk Items are difficult to get rid of due to inability to drop off at a localized transfer station. Electronic Disposal costs too much for televisions.
Confusion on what items are accepted and not a convenient drop off site.
not many places take them and it's expensive to have done.
Have to pay extra for bulk items. Limit on yard waste bags. Electronics disposal not offered and limited hours to drop off.
I have to pay to get rid of electronics. Not sure how to get rid of household chemicals and paint.
Lack of drop off locations
Used car oil, paints etc. seem to have very few drop-off points
Cant find places that take them!
You have to seek out a private firm for recycling motor oil, etc.
Lack of either multiple or a geographically centrally located facility in my community
Hardly any where to dispose electronics
Bulk items options unclear. Yard waste unclear about quantity allowed to put out. dates for yard waste pickup, and when a sticker is or is not needed. To find this information, I had to search County codes. Electronics: Few options due to site closure off of riverside.

19. What concerns do you have regarding waste collection and storage?

Table E-7. Concerns Regarding Waste Collection and Storage

The rotten smell from the landfill
My weekly waste collection and bin is sufficient for 3 people in my household and holds up to scavenger attempts well. The long term storage is an issue. Landfill laws are outdated and written for considerably smaller local landfills. The new larger capacity landfills decimate neighborhoods with toxic odors, excessive truck traffic and long term environmental concerns.
Our landfills in Winnebago and Ogle county are full of trash from Chicago and surround area. My street has 3 collection days. Garbage is all along IL-251 and I-39 from trash haulers coming in from Chicago.
I have a great deal of concern! We live very close to two landfills and they are getting larger by the second. My concerns are air quality, run off into the streams and lakes and anything else in the area that might get contaminated by it, the smells that we smell some of us on a daily basis send some of us on a weekly basis. The gases and chemicals that emit from the landfills are a huge concern for myself, my children and grandchildren's health. I feel that they have reached their limits and it's time to find a different location away from here. Davis Junction, Illinois
I've seen recent pictures of kilbuck creek, it's not looking very healthy. Is our groundwater actually safe? Why are the landfills not buttoning up their gaseous emissions better? Haulers need to be safer on the roads and ensure Their loads are actually secured.
The mountains of waste in my neighborhood are disgusting! Many days of horrible odors. Too many trucks hauling waste filling the streets. Too much garbage leaking out of and blowing off of trucks. AND, the building holding thousands of plastic bottles for recycling caught fire a few months back. My whole house smelled from the thick gray smoke that filled the neighborhood. Is that how you recycle???
None
The odor and health hazards caused by living near this dump.
We are not offered any type of program for pickup.
.
HIIK
Quit picking up Chicago garbage.
Landfill odors
0
Again, stop taking trash from the Chicagoland area. You are running out of storage space because of the volume you allow.
None
not sure what you mean buy storage but the landfill stinks, their must be other ways than to pollute the rivers and creeks around south Rockford.
I would love recycling collected every week not twice a month.
Not convinced it's worth all my efforts. Not sure what or how much is really being recycled. Someone needs to investigate.
We can smell the dump at our house depending on weather- I realize we live fairly close. Also, recycling g needs to be picked up weekly, or we need a larger can for it.
Some overflows. Unclear about recyclable items.
none on my end at my house but a lot of concerns over the hauling and air pollution the landfills keep occurring.
The dump stinks for miles
Garbage all over the roads
I am generally very satisfied with my garbage pick-up. My ability to vacation stop and restart as I'm on vacation a lot.
NA
It should be weekly instead of biweekly and people should get a lower trash haul away rate for recycling.
I don't like that some municipalities allow residents to place garbage out in bags only or trash cans with no lids. This causes unnecessary litter.
No more landfills in our neighborhood .
N
Our City is full of trash and litter which flies out of the garbage trucks. More enforcement needs to be done. They will get tired of paying fines sooner or later.
It comes out of the truck and litters the roadway as well as the smell from the dump travels significantly.
Smell from Winnebago Landfill and/or Orchard Hills Landfill (Ogle County). On some days we can smell it in Rockford, when the wind is out of the south. This needs to be addressed and is impacting property values in New Milford, south Rockford, etc.
I am concerned that not enough recycling and proper processing is being done
I would like to know if my recyclables are really being processed or simply landfilled.
The smell from garbage dump
Affect on neighboring properties
We hope that storage and recycling is able to expand when necessary, plastics reused, and battery collection expanded.
none
None
We should reduce and/or reuse waste as a community.
na
Proper storage and drop off of waste
none

None
I an concerned that we will run out of storage space in our landfill and that the landfill is leaching runoff into our environment and then ultimately contaminating our underground water.
Lack of services, illegal dumping next to roads
None
The amount of waste brought in from Chicago and surrounding areas appears to be tremendous and that is a concern
None
.
Why are we accepting Chicago waste when their is a limited amount of space for disposal? What are your plans for when space runs out????
I think 2 recycling bins/house would be a good idea. Sometimes we have overflow and picking up side items is likely a hassle for the haulers. A second, standard sized bin would help.
That we will run out of room.
pick up of large electronics
Rock River Disposal's recycling bins do not have covers so when its windy the recyclables blow out of the bins into the neighborhoods
None.
None
Long-term issues for the environment.
I think we could do better
I hear that more waste is going to the landfill than in previous years. I am concerned that the U.S. does not maintain recycling facilities that we can well afford, but prefer to dump our garbage on other countries and in the ocean.
running out of room for waste is a concern
Not enough disposal centers and hours open for electronic equipment drop off.
Environmental issues in Rockford and surrounding areas.
More education. A lot of people don't know what is and isn't recyclable. Things soiled with grease or food cannot be recycled even if they have a recycling label.
None
None
WE shouldn't be the dumping ground for larger cities outside of Winnebago County.
none
No concerns
None
None
No concerns unless I am right about too much garbage going into the landfills that shouldn't
Pick up should be more automated. Containers should be picked up by trucks equipped with armatures, not manual labor. Containers should be standardized.
need to pick up anything that is left curbside at the price we are paying
The smell, which has improved this summer, had been sickening. Even now, to drive along Rt 251 south of Rockford, or Baxter Rd east of 251, the smell is still bad.
Dump is to large
I have issues with the land fill stench, trucks, trash blowing into our property. Our families health living near this disgusting mess.
Pickup schedule varies widely. Wind days result in several tipped over trash cans that sit outside awaiting pickup.
Air Quality, Methane Gas, Water run off direct from Orchard View into Kilbuck Creek. The continued expansion of botb Winnebago City LF & Orchard View when they cant control the terrible smell that affects area residents that literally gets people sick & causes respiratory issues. If their going to continue to expand why not buy out local area residents? you cant expect to have 2 of the largest LF's in the state to continue to expand w/o compensating those who are directly impacted daily. The lack of regulation is simply astounding & so wrong!
The landfill should not be expanded and New Milford residents should not have to BEG for a solution to the smell.
In a nut shell, the run off contamination to the land and water, contamination to streams or lakes, toxic air we are breathing which is leading to real heath problems. The foul smell coming from the dump that keeps us from enjoying being outside of our homes. Can't enjoy just sitting on the deck depending which way the wind is blowing.
Recycling is pretty well non existent in rural areas
None.
Storage?
The management of the waste facilities.
Detailed plans are the company's job. More need to be done related to storage. A search of other communities do who have improved their storage problems
Landfill expanding!
None
Not sure that it's promoted enough
that we won't have enough storage

None
I am concerned with the amount of waste actually getting recycled.
This is a repeat of what I stated in question 20. I have heard from several people that have been at the landfill dumping their yard waste, that recycled items are being dumped in the landfill by the contractors that pick up recycling from homes.
garbage trucks litter to much
how the land fill brings in garbage from other counties
Wonder if we are using too much water to rinse recyclables. Would that be better done at a facility in bulk?
??
Is the recycling getting dumped in the same place garbage is going?? Rumor has it, it does & we are paying extra for that?
making it easier and more common for people to do this so that it doesn't require a lot of thinking or taking time out of a day to do so.
What is the lifecycle of current landfill
Garbage on the road side to the dump on 39
I'm concerned that our recycling isn't actually being recycled, largely due to there not being a market for items such as plastic. There needs to be greater transparency and accountability with our recycling process; municipal coproduction requires such to be effective.
making sure that the companies follow regulations and handle waste properly. Having more education on proper recycling to the community so that more items recycled can be properly recycled. And the amount of debris/litter created by pick up services is alarming.
Accurate fees. Management of fumes and unsafe practices affecting our quality of life. Giving needed space in landfills to outside counties. Poor recycling management and no advocacy to improve recycling, no transparency when recycling abilities change or when issues arise.

20. What needs do you have regarding waste collection in your community that are not currently being met?

Table E-8. Community Waste Collection Needs

we need waste disposal that does not smell
Electronics and Bulk items
The odor pollution from both landfills in the area is horrendous. Our roads are full of trash.
None
Curbside is currently fine. Better management of emissions is a serious concern at this time.
Just easier recycling of items that cannot/should not go to the landfill
None
Garbage haulers needs to be held responsible
Pickup at our home.
Landfill management
Picking up large items if needed
Not known
No comment
Need to take everything you put out
Na
None
some times a lot of times they loose the garage on the ground and street and we have to pick it up for the second time . it does get old.
None for us except weekly recycling pick up.
n/a
Education about recycling and our impact on earth
Food waste
Already explained previously regarding paint.
The dumps stink. The dumps are close to water ways, farm land and homes.
Clean up the odor in our area
None
E-Waste and Household Hazardous Wastes
There needs to be a new community place for the Byron area. All small towns should have a community waste area with cameras to catch the bad people that dump TVs and other items.
A more localized household hazardous waste collection facility. More focus on building materials recycling and deconstruction is also needed.
Stop the smell.
Yard waste pickup
Medical waste.
Recycling pick up is not offered at my location and it is upsetting.

n/a
Making sure we are all doing as much as we can.
A closer hazardous waste facility or collection.
Smell from the garbage dump
Ease of recycling receptacle replacement
Possibly easier battery/electronic pickup for recycling
more curbside available or one location to drop off.
See item 20
Not sure what to do with old paint.
na
General information provided by government on waste management and collection
electronic recycling
I do not know
There should be increased education for the public on where the closest hazardous waste, electronic waste, and recycling centers are so they can safely dispose or recycle.
composting
None
none
Apartment complexes, who, arguably, create the most waste, are not given convenient opportunities to recycle
.
Need Recycling curbside pick up in the County.
More info and local encouragement to get more people on board. Also, more transparency and information about what actually happens to blue bin items once they are hauled from the home.
Information on disposing of large items or hazardous items
pick up of large electronics
None
n/a
None
No issues.
Easier way of recycling electronics
Household batteries Styrofoam containers. Even if triangled, I am not sure they are recycled.
disposing of paints and stains, motor oil
Electronic Disposal Services
Environmental concerns including air quality, runoff and pond/lake quality.
People shouldn't have to pay extra for recycling or composting. Residents should pay for collection services based on the size of the trash can needed, with recycling and compost included at no additional cost.
I would like curbside yard waste pickup as opposed to driving it to the community compost file.
Would rather recycle than throw away batteries. Having an option to recycle TVs, etc. curbside would be helpful as it's hard to coordinate otherwise.
Future planning for our own waste should come first before out of county needs/revenue.
none
No needs
None
Bulk items??
Everything I need is being met
Just make it more automated.
they should provide the cans since they damage ours, outlying communities are provided roller cans
Old televisions; not knowing where to recycle them.
None
My needs are met with no help from the landfill.
More consistent pickup schedule.
The amount the County spends to clean up the litter from the haulers is close to equalizing what revenue they get. Air Quality is terrible and yet yr. after yr. it continues to get worse not better as the 2 LF's grow at a brisk pace!
Need to be able to dispose of paint, electronics, etc. at the curb.
Recycling drop off for electronic items and household cleaning products and paint.

metal disposal
None
Needs are met
Lawn waste, garbage and recycling haulers do their jobs well.
Respect and responsibility.
Landfill expanding & the smell!
Bulk Item and Electronic Disposal.
None
none
None
Expanded recycling.
Having to pay to get rid of large appliances and TVs
to much plastic waste. Need more recycling
the land fill maintaining its property
What to do with freon and other such items
Huh
Batteries, electronics, used old paint/chemicals
Unsure
none come to mind
None
Municipal composting.
Community compost (I compost myself, but I'm sure the community would benefit from an option for pick up-for those who don't want or know how to compost on their own.)
Bulk pickup dates. Increased capacity for lawn waste so I don't have to fill my garage and parcel them out across the month (to avoid overcharging). Curbside hazardous waste drives (similar to bulk pickup dates). Real recycling services.

21. Are there any opportunities or ideas you would like to highlight?

Table E-9. Community Ideas and Opportunities

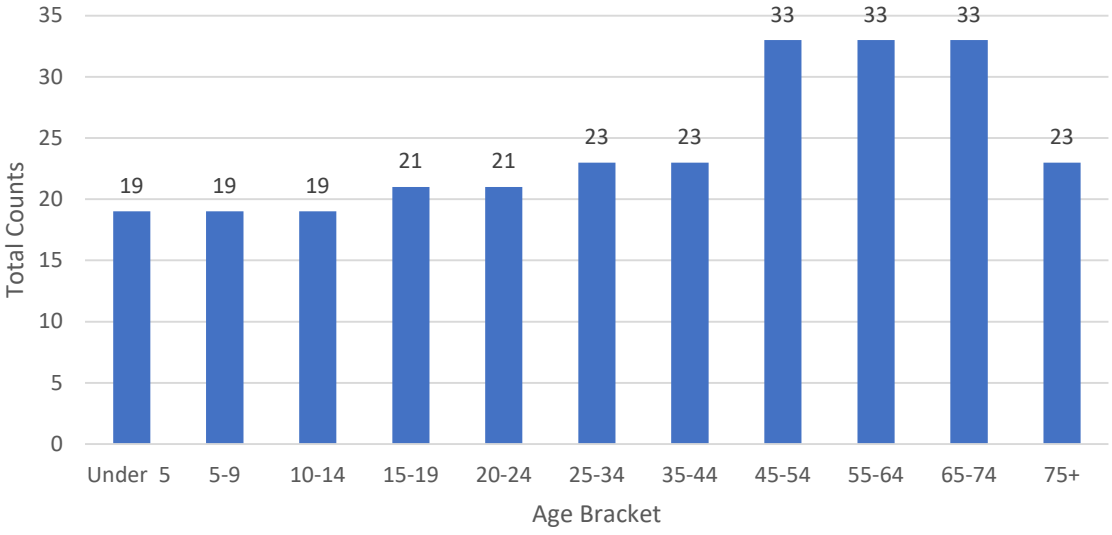
recycling, composting, waste to fuel
I would like to find an electronics (E-waste) recycler and offer periodic services to the community.
Stop hauling in trash from Chicago and suburbs. Streamline collection days. Fix the air quality smell suppressant systems at the landfills.
,
Noted prior, thanks
Just recycling tires, furniture, mattresses.
No
We need clean air.
Separate bin for curb side pick up of recycling items
Landfill management/smell containment
No
Need a electronics drop off or more like the one that used to be at South Main mobile.
No
No
Na
No
yeah you spill it you pick it up.
I would love to see/ smell a better use of the ethanol gas expelled from the landfills. Other countries use this energy for powering cooking stoves, lights and heat.
n/a
I would love to see some composting opportunities/education
Regular reminders/educational campaigns for recycling would be appreciated.
More measuring of air quality in random unannounced checks
Already stated
Yes
None
No

Get money off your trash bill for recycling.
none
No
No
No
Community education on how to recycle and increase support to encourage recycling
n/a
A full resource available to everyone on line or website, new bins that label what they recycling materials are, so that eliminates confusion and we can be sure we are recycling the right materials.
No
Move the dump
Nope
N/A
none
Electronics and Battery Recycling. More emphasis on Extended Producer Responsibility and waste reduction
No.
na
More information/material provided electronically (reduce more waste) on what is disposable, who can collect it, and where to drop it off
no
none
It would be helpful if the City or County had an interactive map where the locations and times of recycling centers, bulk item drop off etc. where located so you could type in your address and see what is closest for electronic waste drop off for example.
Public composting would be incredible
None
No
I would like recycling to be more convenient and cost effective
.
At all fairs and craft shows you need to have information table.
N/A
No
n/a
Stop bringing garbage in from Chicago until a way can be found to actually keep it in the trucks on the way to the facility and hold the drivers responsible.
n/a
No
None at this time.
None
find more outlets for recycling and quit taking Chicago garbage for money.
n/a
Same as above
Winnebago County must take more responsibility for the environmental protection of its citizens and natural resources including but not limited to spraying for insects and unmonitored runoff.
We should be more like Portland or Seattle. Make it so trash only comes every 2 weeks so that people are more cognizant of the waste they produce and are forced to reduce consumption.
Na
Would rather recycle than throw away batteries. Having an option to recycle TVs, etc. curbside would be helpful as it's hard to coordinate otherwise.
Keep trash disposal local.
none
None
No
Bulk item recycling
Education for recycling and ways to go green for those who don't know what to do
Incineration needs to be fully explored. Technologies have advanced to make this a no brainer. There are plenty of best practices to check out and reveal their benefits.
I am concerned on the land being taken up in our county for Chicago garbage
None that I can think of right now.

Stop taking waste from other communities. The fees that are collected by the county should be returned to the area most affected by the physical presence of the dump. The more influential northern part of the country was able to block blacktop production but the south part of the country has to endure a never ending expansion of a dump. What will be the long term problems from all the expansions.
Yes, this needs to be cleaned up and reduced
Stop expanding landfills in my area and do something about the ever worsening air quality.
Find a new more uninhabited, less dense area to use for Landfills far from creeks or water supplies & rivers. And do not locate them right off I39 & 251or close to a Airport.
No
Stop expanding the two dumps. At the very least, just except garbage from our surrounding countries only.
no
No
Yes, the toxic smells and ground water needs to be taken care of so as not to room our health and our neighborhood
No
No
Get rid of the smell & NO to expansion.
I believe our community would benefit greatly from a localized transfer station within Winnebago County where large items and electronics could easily be disposed of.
None
none
No
More education on composting.
We pay a lot of money for garbage and recycling pickup, we shouldn't have to pay extra to get rid of TV's and large appliances
People need a place to get rid of waste without dumping along roads
Garbage truck over flowing on the way to the land fill, so much waste on the side of the roads on the way to the land fill
Sell stickers for garbage bags in excess of 2-3 medium bags a week.
No
I think I've voiced my concerns
N/A
None come to mind
Yes do something for the people in the area of the landfill about the smell
n/a
n/a
Curbside composting and hazardous waste options (ex Elgin)

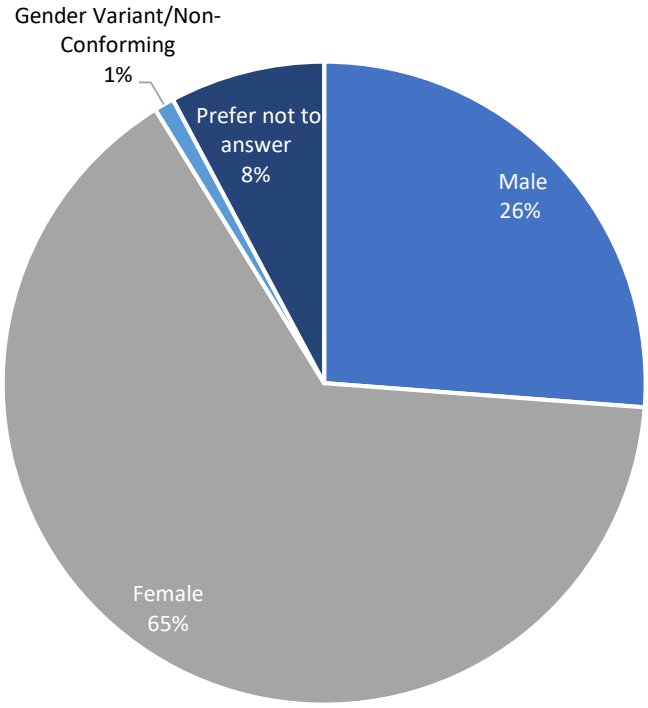
22. Including yourself, how many people in your household are…

Figure E-20. Number and Age of Household Members



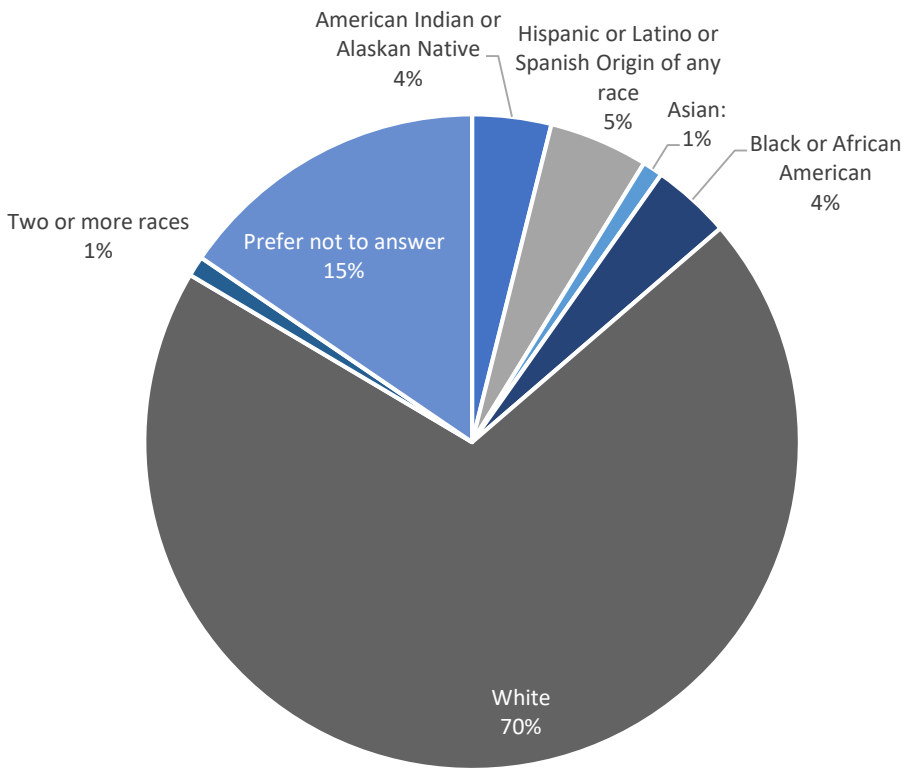
23. What is your gender identity?

Figure E-21. Gender Identity



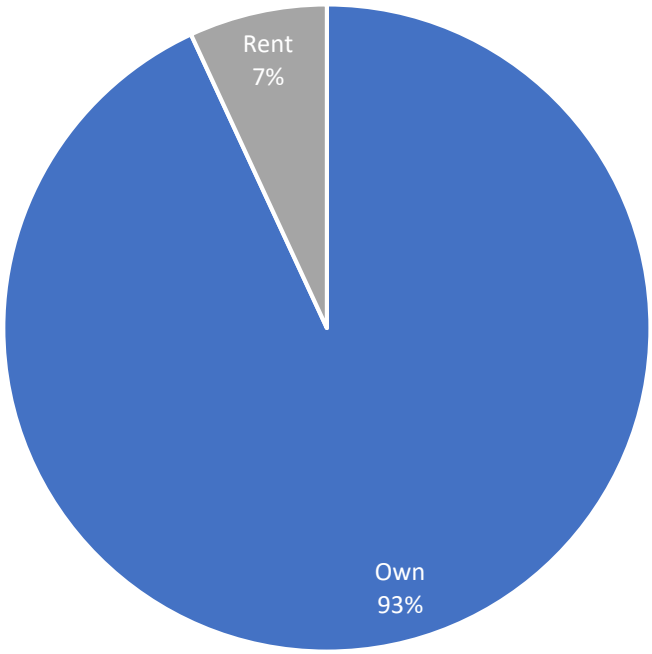
24. How do you best describe yourself?

Figure E-22. Racial Identity



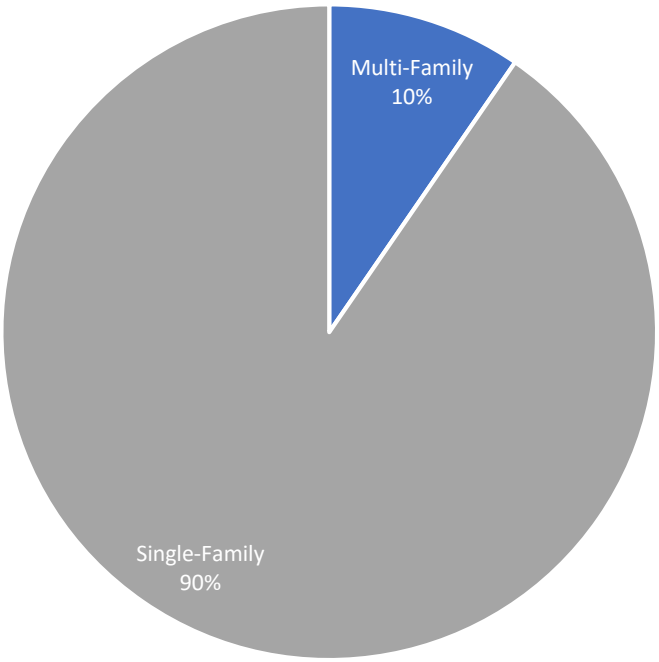
25. Do you own or rent your current residence?

Figure E-23. Residence Ownership



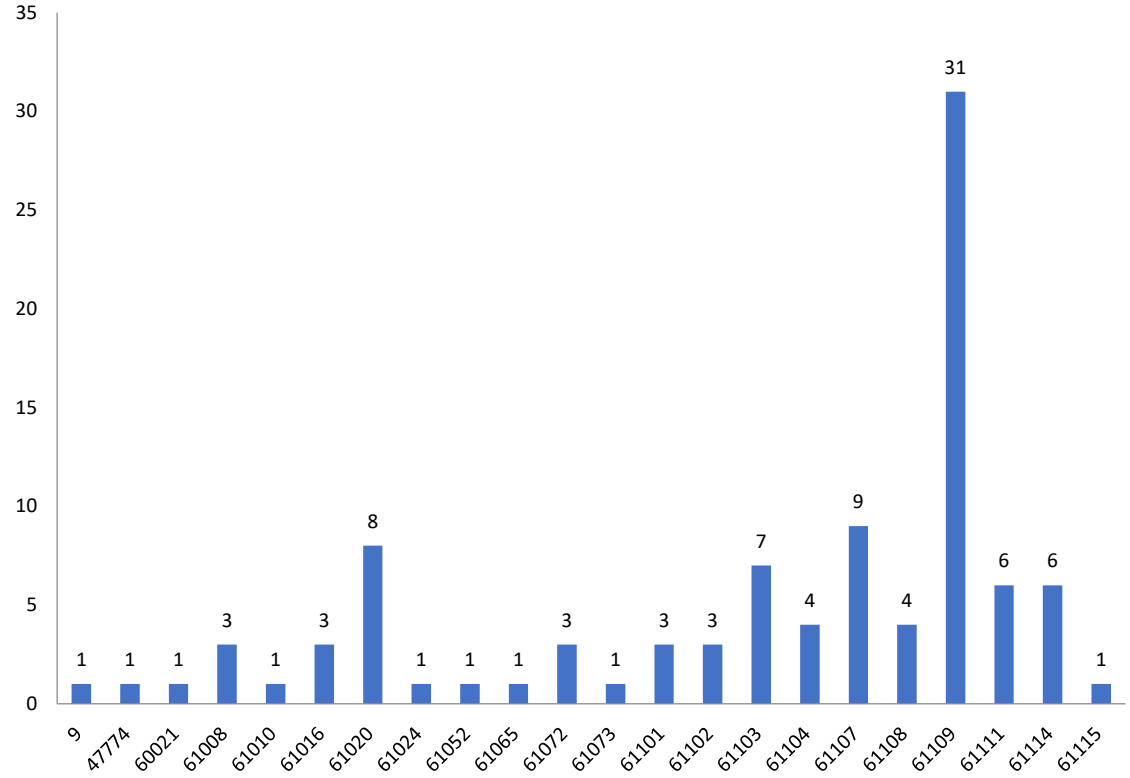
26. What type of residence do you live in?

Figure E-24. Residence Type



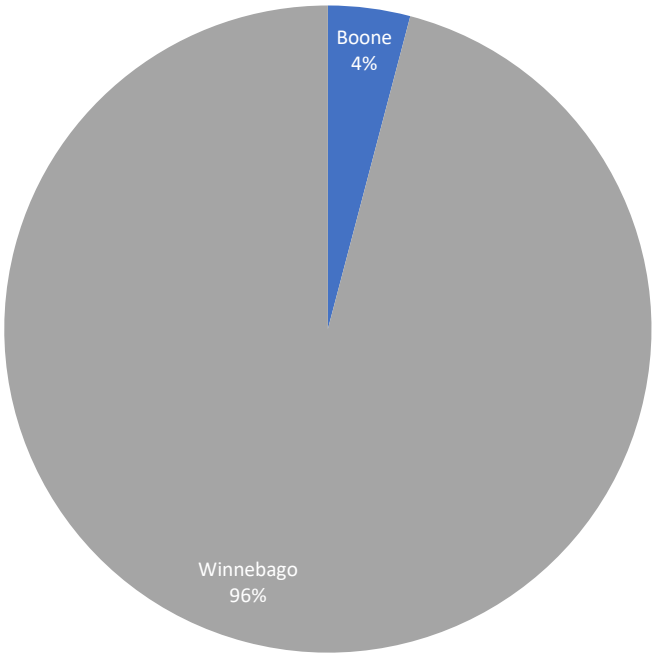
27. What is your home zip code?

Figure E-25. Respondent Zip Code



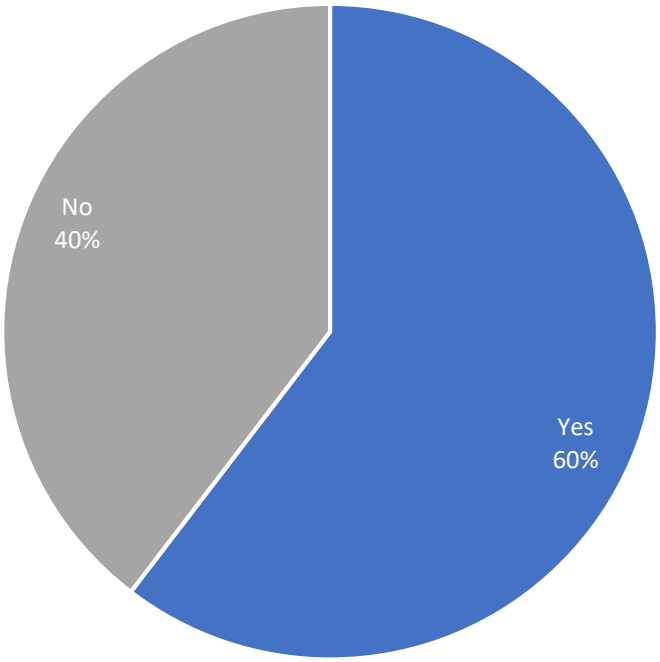
28. What County do you live in?

Figure E-26. Respondent County



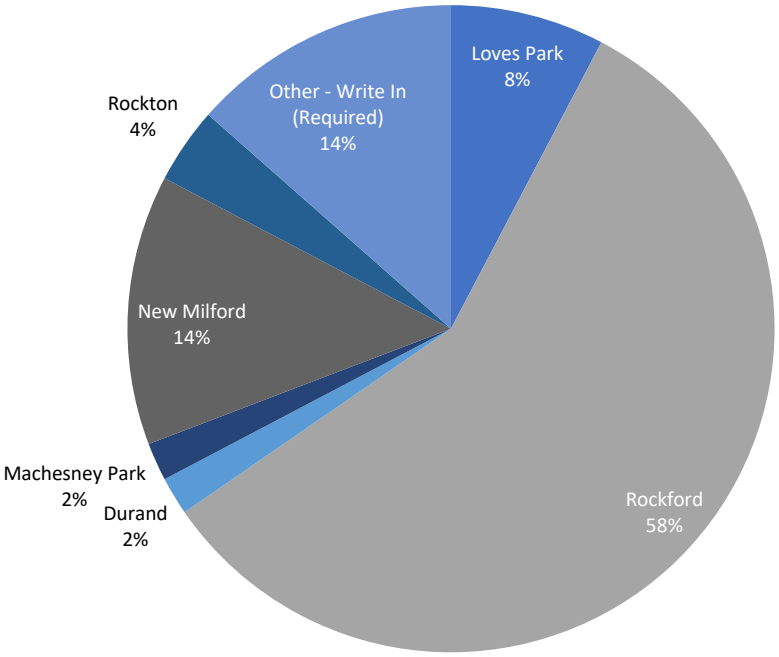
29. Do you live in a municipality?

Figure E-27. Respondents Living in Municipalities



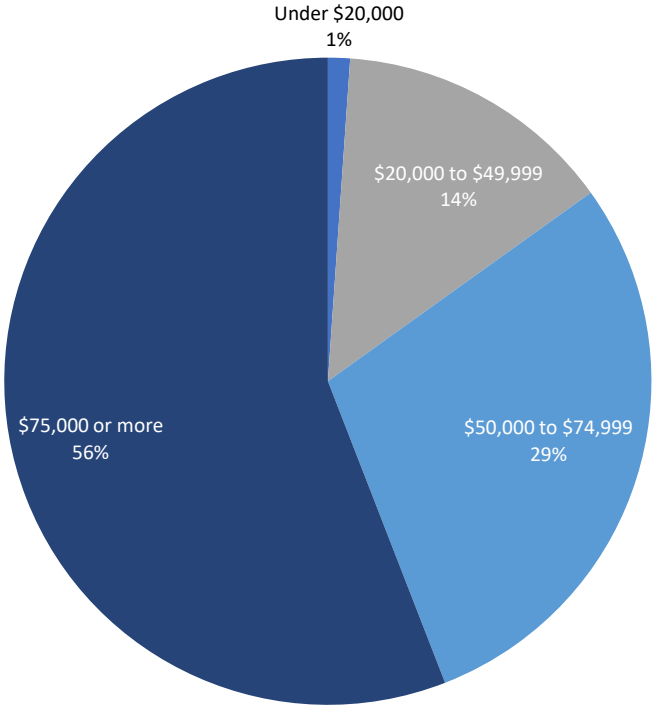
30. Which municipality?

Figure E-28. Respondents Municipality



31. Your total annual household income is:

Figure E-29. Respondent Total Annual Household Income



Record of Public Comment

Name	Organization	Topic	Comment	Comment Response
Thomas Hilbert	Waste Management	Implementation/ waste management options	You know, with respect to 'what did the plan miss', the one thing I am used to seeing in solid waste management plans is a recommendation for waste management practices moving forward and I just didn't see where this document provided some clear recommendations for what to, you know, what the county would rely on for their waste management options moving forward so, you know typically it would be something as simple as continue to rely on landfill for solid waste disposal needs, look at other options, and as they become available or reasonable, from an economic perspective we would work to bring those into our waste management options. you did a really good job of describing various different options that are out there but you didn't' really provide a direction for which way the county would be going moving forward...There was a lot of emphasis on waste to energy, which is understood, including using landfill gas as a you know describing it as a waste to energy technology, but really in this day and age, you know the two primary mechanisms that are used throughout the us, are landfilling and waste combustion, you know waste to energy through combustion and then to a much, much lesser extent some of the other things you guys looked at so I just, it would be nice to see something in there about how the county intents to rely on existing technologies until others become available.	Appendix B details the implementation plan. More factors must be studied for additional detailed recommendations. R1 has added information in Appendix B to clarify current and proposed efforts to manage waste. The Plan will allow for the organizing and prioritizing of further implementation planning.

Record of Public Comment (Cont.)

Name	Organization	Topic	Comment	Comment Response
Lori Gummow	Winnebago County	Implementation	Good evening, great plan. A couple of my questions are can you elaborate what other counties did you use as models for their solid waste management plans? What other resources did you use in the state of Illinois? I know it's been awhile since Illinois has done a waste characterization study, do you know what's the most recent one that's been done?	R1 reviewed many resources to inform this plan, including the IEPA's most recent landfill capacity report (2020), historic plans from Boone and Winnebago Counties, a best practices Planning Advisory Service report authored by Dr. Ai and the American Planning Association, the Solid Waste Agency of Lake County's most recent plan, and plans from surrounding counties. The most recent waste characterization study for Illinois was completed in 2015. Reports that covered waste characterization in Boone and Winnebago Counties specifically were released in 2005 and 2010, respectively.
Lori Gummow	Winnebago County	Public Survey	You had over 100 people that participated in the survey. How did you gather that--those 100 people? How was it that they were targeted for this survey?	The survey was distributed through existing partnerships, press releases and social media posts.
Thomas Hilbert	Waste Management	Public Survey/ Diversion Rates	Do you guys have an idea of the geography of where the responses came from? Southern Winnebago? Rockford? It is an interesting question because the services to residents in the City of Rockford are going to be different than the services offered in Machesney Park, and Rockton, and Roscoe and New Milford and all the different various communities. They all support different or offer different levels of services depending on what they chose as a plan with their solid waste hauler, you know if they have a hauling agreement. Some of them don't if it's by subscription like the county. That would be of interest, I'd think. You know, as you're trying to address the Counties' needs and trying to give them, people some direction to achieve the goals, which you know, in my mind the primary ones that are really good goals to have are, you know trending towards minimizing the amount of waste that we generate that has to be disposed of either through a landfill or waste to energy type process or digesting, however it gets managed at the end of life cycle, I'm rambling a little bit but I did like the goal of going from you know our current estimated 18 percent diversion rate to 30 to 40 percent which is more online with the national diversion rate, It seems to me I remember the national diversion rate being somewhere around 35 percent. That in and of itself is a pretty big first step. Winnebago's worked pretty hard in various steps to up its diversion rate. The City of Rockford went to bigger recycling containers and it would be interesting to know why we are below the national average.	Most of the responses of the survey came from Winnebago County (96 percent), with approximately 28 percent of respondents from the southern area of the county. From secondary sources, it appears the organic diversion rate in the two counties are particularly lower than the state and national averages. Given that organic waste tends to be bulky and heavy, focusing on that category could boost the diversion rate considerably.
Thomas Hilbert	Waste Management	Diversion Rates	I do have just one additional comment on the jump from 18 to 35 percent [referring to the diversion rate]. Have you identified something that is an obvious thing within the Winnebago waste, Winnebago and Boone County waste generation that you know, is why we fall to 50 percent of what would be a normal diversion rate? You know, is it the amount of composting that occurs, or because those types of things derive big percentages.	While the modeling conducted for this project is very robust, material-specific information is harder to define because jurisdictions have defined waste categories differently over the years and from one another. This can make it more challenging to understand why the area is behind, as waste categories are defined differently in different locations, and sometimes differently through the years within a jurisdiction.

Supporting Data & Methodology

Region 1 Planning Council Analysis

Region 1 Planning Council (RPC) staff performed the initial feasibility of the detailed WTE methods with the use of UIC's data waste stream composition and diversion projections and NREL's local WTE technology analysis. The analysis included reviewing the largest shares of the waste stream. This evaluation also used feedback from the public through the Solid Waste Management Survey data, in addition to comments from the first solid waste public meeting. Other components used to evaluate WTE feasibility were the physical space necessary for operation, the measure of net GHGs produced, the level of complexity, and overall economic benefits (e.g. job creation).

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The following explanation was authored by Dr. Ning Ai.

Introduction

To support the waste management plan update in Boone and Winnebago Counties by the Region 1 Planning Council (RPC), the research team at the University of Illinois at Chicago (UIC) has been tasked with (1) estimating annual waste volume, (2) developing waste projections into 2040, and, subsequently, (3) developing waste management scenarios, and (4) analyzing environmental and economic impacts associated with various scenarios in Task 3.

Given the limitations of historical data and time constraints to conduct waste audits, the UIC team has developed models for waste volume estimates and waste management scenario analysis. The methodology of numerical analysis is designed with the intention of replicability, especially for regions where material and waste management data have not been regularly collected or reported.

This document summarizes data availability in Boone and Winnebago Counties, the method of waste volume estimates and key data parameters adopted, and the method for waste scenario planning and analysis. The document aims to facilitate a transparent planning process, and importantly, highlight the critical need for consistent and quality data that reflect local characteristics.

It is important to note that the definition of municipal solid waste (MSW), as the general scope for the waste management plan update in Boone and Winnebago Counties, varies considerably by region. This project focuses on MSW generated from residential, commercial, institutional, and industrial (non-hazardous) locations. Construction and demolition (C&D) waste and sludge are examined separately and excluded from the total MSW volume, unless noted otherwise.

Data Availability in Boone and Winnebago Counties

For this study, both waste quantity and material composition data in Boone and Winnebago Counties are needed. The UIC team has screened all relevant documents provided by RPC, regional stakeholders, as well as other publicly accessible datasets of Boone and Winnebago counties, including:

- Winnebago County (1991 SWMP, 1996-2001, 2007, 2011, 2016 plan updates)
- Boone County (1992 Waste Characterization Study, 1995 SWMP, 2006 plan updates, IEPA MW recycling survey 2000, 2004, 2005)
- City of Rockford 2014-2021 residential waste summary data
- Public Solid Waste Management Survey Results from RPC in Fall 2021
- Illinois Waste Characterization Study (2009)
- Illinois Waste Characterization Study (2015)

Significant data constraints were identified in the study region. The most recent waste reports are from 2010 in Winnebago County and 2005 for Boone County, which do not cover economic fluctuations in the last decade or recent impacts of pandemic conditions. Another major limitation is that historical reports have employed inconsistent definitions (e.g., waste disposal volume vs. generation volume) and categories (e.g., whether industry waste, sludge, or C&D are included). To ensure a consistent scope of waste volume estimates over time, and at the same time, to reflect on local conditions and waste compositions, this study has primarily referenced the Illinois Waste Characterization Study (2009 and 2015) and Boone County Waste Characterization Study (1992) for numerical analysis. Other datasets are used for data verification and model calibration.

Methodology Overview

Constraints about historical data and uncertainties about the baseline conditions in Boone and Winnebago Counties do not allow waste inventory analysis or volume projections solely based on historical data in these two counties. Therefore, this study has designed a method that couples county-specific characteristics (e.g., population, housing units, and employment by sector) with waste generation rates in Illinois, refers to practices in comparable regions and the national average, and verifies modeling results with local facility managers and planners.

This section explains the general approach for the four specific tasks for Boone and Winnebago Counties: (1) estimate waste generation and composition; (2) project waste volume into 2040; (3) develop waste management scenarios, and (4) analyze the impact of waste management scenarios. Tasks 1 and 2 both rely on regression models and adopt a similar structure, and thus are summarized together below. Further details are provided in 2.1.4 "Regression Models for Waste Volume Estimates."

Waste Generation and Composition Modeling

This project has developed regression models that predict waste generation and composition in Boone and Winnebago Counties based on local conditions. Regression models connect dependent variables (e.g., waste generation) with independent variables (population, housing, employment, etc.). Adjustments are also made to allow the models to analyze for both residential and commercial sectors separately. Additional analysis has been conducted to identify distinct characteristics in urban vs. rural areas (discussed in Urban vs. Rural Delineation under E.2.2.4).

This project tested over 20 combinations of independent variables (with varying data transformations). The deployment of the final model considered the goodness-of-fit (R2 and Adj r), validity (e.g., low multicollinearity), and differences of predicted waste generation rates compared to observed values.

Scenario Development for Waste Diversions

This project has developed three scenarios for Boone and Winnebago Counties' waste management practices: baseline, short-term, and zero waste.

- The Baseline Scenario was developed in reference to the reported data in Boone County and Winnebago County, regional stakeholder interviews, and peer region performances. Given uncertain impacts of pandemic conditions, the year of 2019 was chosen as the baseline year.
- The Short-Term Scenario is designed to be a feasible goal in the next 3-5 years in the study region. It aims to keep pace with national average rates of waste diversion and present best practices in Illinois.
- The Zero Waste Scenario adopts a 90% diversion rate or higher for each material type. It is an aspirational goal that would require the engagement of all citizens and sectors in Boone and Winnebago Counties and beyond.

For each scenario, overall diversion rates include all types of MSW materials and reflect a weighted average using 2019 waste tonnage estimates. Diversion rates also factor in service coverage (specific materials accepted/recycled/recovered), participation rates (percentage of businesses and residents participating in recycling), and material contamination (percentage of unaccepted items dropped off in recycling carts). Specific material recovery rates were determined in reference to Tables 4-1 and 4-2 in the 2015 Illinois Commodity/Waste Generation and Characterization Study Update. Contamination in curbside recycling tends to be around 20-25% in many communities in northern Illinois. This study used 15% in the baseline scenario, as a conservative estimate for Boone and Winnebago counties. Numerically, the overall diversion rate has been calculated as Equation (1).

Equation 1

$$\textit{Overall Diversion Rate} = \frac{\sum(G_{i,j} \times M_{i,j} \times P_i \times C_i)}{\sum G_{i,j}}$$

Where:

$G_{i,j}$: Waste generation of material j in sector i
i: Sector i
j: Material j
$M_{i,j}$: Service/material capture rates of material j in sector i
P_i: Participation rates of sector i
C_i: Contamination rates of sector i.

Environmental and Economic Impact Analysis of Waste Management Scenarios

The U.S. EPA Waste Reduction Model (WARM) has been used to calculate environmental and economic impacts. The WARM model is used to help solid waste planners and organizations track and voluntarily report greenhouse gas (GHG) emissions reductions, energy savings, and economic impacts from different waste diversion efforts.

Essentially, the WARM model assesses the difference of impacts from two waste management scenarios (i.e., baseline vs. comparison) based on waste volume and management method. Users specify how much waste is managed by each of the applicable methods (i.e., recycled, composted, landfilled, anaerobically digested, combusted, or source reduced) in both scenarios. Users can customize model parameters or directly adopt the default parameters embedded in the model. Then the WARM model returns outputs for the difference of impacts between the two scenarios.

Plugging in the data parameters discussed above, the WARM model was run twice in this study: first, comparing the Short-Term Scenario to the Baseline Scenario; second, comparing the Zero Waste Scenario to the Baseline Scenario. In the model result, this study focuses on three types of impacts: (1) carbon emissions measured by metric tons of carbon dioxide equivalent (MTCO2E); (2) energy consumption in millions of BTUs (MMBTU); and (3) job impacts or labor hours. Instead of focusing on the end-of-pipe pollution impacts, the WARM model assumes life-cycle boundaries start at the point of waste generation (i.e., the moment a product such as paper or dimensional lumber reaches its end-of-life stage). In terms of job impacts, the WARM model only accounts for direct jobs associated with different waste treatment methods. In other words, the inter-sectoral impacts, or multiplier effects, of waste diversion programs are not measured in the WARM model. To ease data interpretation, this study has converted the estimated labor hours to full-time equivalent jobs (FTEs) by a factor of 2080 hours/year (40 hours/week*52 weeks).

Regression Models for Waste Volume Estimates

As explained earlier, this study has developed regression models to address data gaps and predict waste generation and composition in Boone and Winnebago Counties based on local conditions. This section explains the data inputs that characterize local conditions, regression model specification, and final model selection and validation.

Data Inputs for Independent Variables

Due to data constraints, this study has focused on three sets of socio-demographic variables to predict waste volume and composition: population, housing, and employment.

Population size directly affects the total waste generation. The historical population data are collected from the US Census; the population projection for Boone and Winnebago Counties is provided by RPC.

Besides population, variables of interest relevant to waste generation include the number and type of housing units. Notably, waste generation rates and composition (as well as challenges of waste diversion) vary by housing type.

This report collects and analyzes data on the numbers of both single-family units (i.e., housing structures with four or fewer units) and multifamily units (i.e., housing structures with more than four units) separately for residential waste analysis.

Commercial, institutional, and industrial waste generation are associated with local employment, both in terms of the size of institutions and the mix of industrial sectors. Historical employment data (1990-2020) were retrieved from the County Business Pattern (CBP), which surveys business establishments for the number of individuals employed (in March of each year) and the first quarter payroll for each detailed industry (at the 6-digit NAICS code level). All industries have been categorized into six major industries based on the 2-digit NAICS code. The annual employment projection (2020-2040) is provided by RPC and classifies employment differently from CBP. In addition, the CBP dataset excludes non-wage employment and governmental jobs. Therefore, the UIC team developed crosswalks and adjustments to connect historical and projected data.

Urban vs. Rural Delineation

The UIC team was also tasked with providing separate estimates of waste generation for urban and rural areas for the two-county area. A confounding factor is that the US Census Bureau has continuously revised the urban area criteria over time. The most relevant definition from the US Census Bureau states that urban areas are "core census block groups or blocks that have a population density of at least 1,000 people per square mile and surrounding census blocks that have an overall density of at least 500 people per square mile."

The UIC team collected the population and housing units in the urban and rural areas within the two counties for 2000 and 2010. These are the only data points where urban and rural definitions are consistent and available. Employment datasets, however, do not differentiate urban from rural areas. To address the mismatch of geographic boundaries in employment statistics, the UIC team extracted data from ZIP Codes Business Patterns. Then the ZIP code boundaries were overlaid with urban/rural boundaries in ArcGIS in order to re-classify all ZIP codes in the study area into urban versus rural. Eventually, aggregations of ZIP code employment were created for urban and rural areas. Similarly, the UIC team calculated the urban-rural ratio for each independent variable and applied linear projection for these ratios into the next 20 years.

Equation 2

$$\ln(W_{m,pc}) = \beta_0 + \beta_1 \ln(POP) + \beta_2 \ln(HOS_{pc}) + \beta_3 \ln(EMP_{pc}) + \beta_4 YEAR + \varepsilon$$

Equation 3

$$\ln(W_{m,pc}) = \beta_0 + \beta_1 \ln(POP) + \beta_2 \ln(SFH_{pc}) + \beta_3 \ln(MFH_{pc}) + \beta_4 \ln(AMUC_{PC}) + \beta_5 \ln(MFG_{pc}) + \beta_6 \ln(WHSLE_{pc}) + \beta_7 \ln(RTL_{pc}) + \beta_8 \ln(SVC_{pc}) + \beta_9 \ln(INST_{pc}) + \beta_{10} YEAR + \varepsilon$$

Equation 4

$$\ln(W_{m,pc}) = \beta_0 + \beta_1 \ln(POP) + \beta_2 \ln(HOS_{pc}) + \beta_3 MFH_{pct} + \beta_4 \ln(EMP_{pc}) + \beta_5 AMUC_{pct} + \beta_6 MFG_{pc} + \beta_7 WHSLE_{pct} + \beta_8 RTL_{pct} + \beta_9 SVC_{pct} + \beta_{10} INST_{pct} + \beta_{11} YEAR + \varepsilon$$

Where:

$W_{m,pc}$:Per capita waste generation of material m.

POP: Population

HOS_{pc}: Per capita housing units.

EMP_{pc}: Per capita employment.

$YEAR$: Year indicator

SFH_{pc}: Per capita single family (equal or less than 4 units) housing units

MFH_{pc}: Per capita multifamily (more than 4 units) housing units.

MFH_{pct}: Percentage multifamily (more than 4 units) housing units.

$AMUC_{pc}$: Per capita Agriculture, Mining, Utility, and Constructure employment.

$AMUC_{pct}$: Percentage Agriculture, Mining, Utility, and Constructure employment.

MFG_{pc}: Per capita Manufacturing employment.

MFG_{pct}: Percentage of Manufacturing employment.

$WHSLE_{pc}$: Per capita Wholesale employment.

$WHSLE_{pct}$: Percentage of Wholesale employment.

RTL_{pc}: Per Capita Retail Trade employment.

RTL_{pct}: Percentage of Retail Trade employment.

SVC_{pc}: Per Capita of Service employment.

SVC_{pct}: Percentage of Service employment.

$INST_{pc}$: Per capita Institutional employment.

$INST_{pct}$: Percentage of Institutional employment.

Figure E-30. Average Difference Between the Predicted and Observed Values for Each Modeled Material

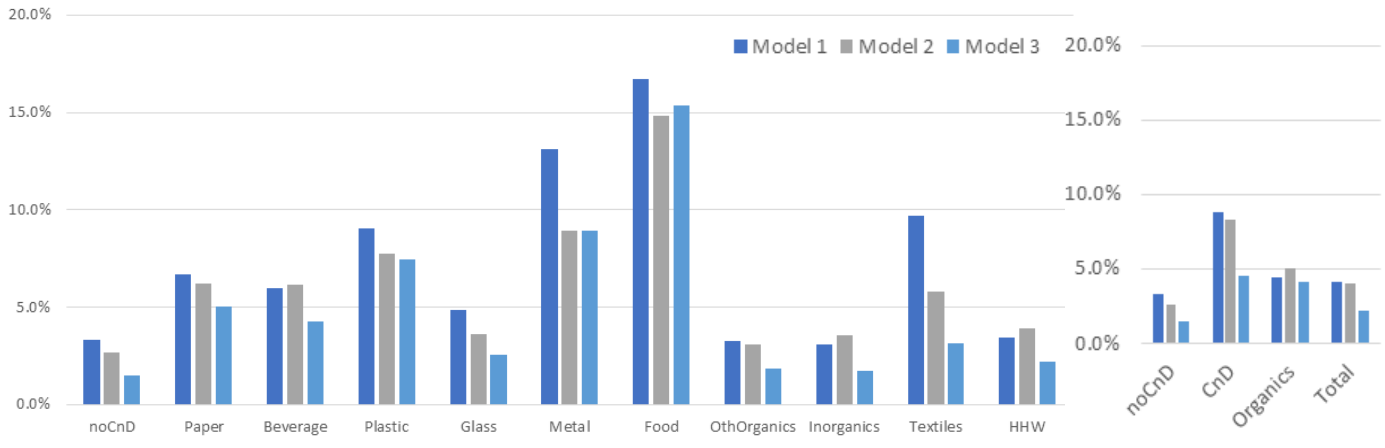


Figure E-31. Difference Between the Predicted & Observed Values for Each Modeled Material in Winnebago & Boone Counties

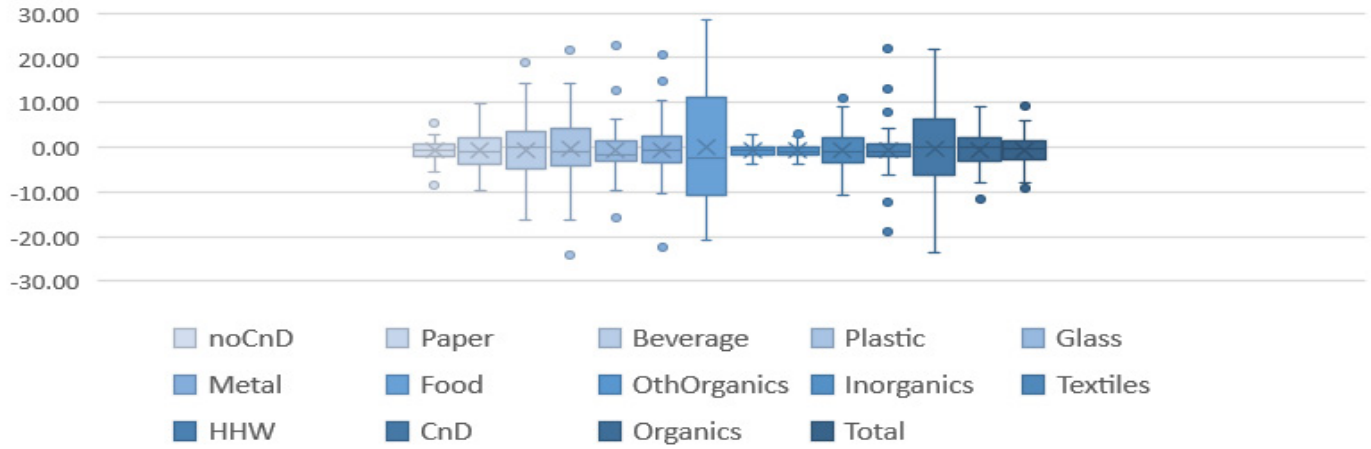


Figure E-32. Waste Generation (Excluding C&D) in Boone County: Estimates vs. Reported Data

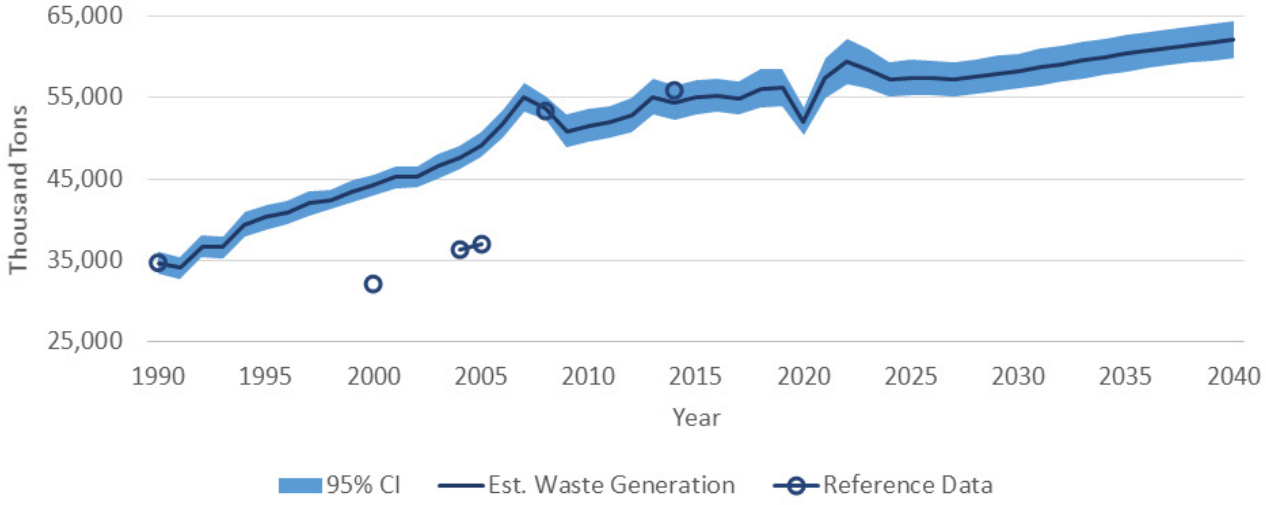
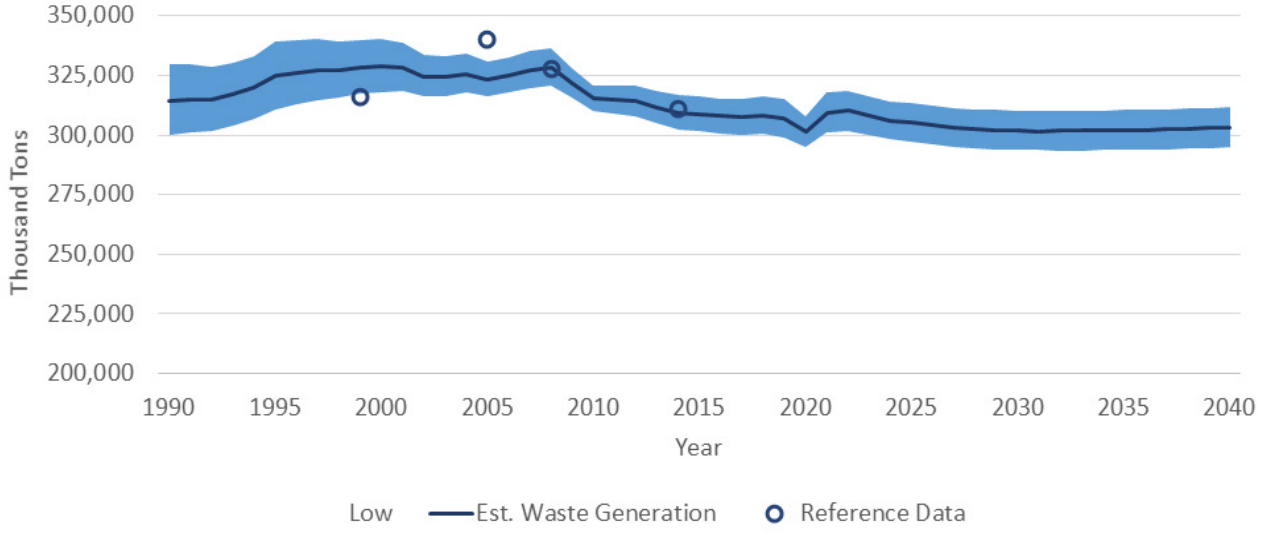


Figure E-33. Waste Generation (Excluding C&D) in Winnebago County: Estimates vs. Reported Data



Regression Model Specification

Equations 2-4 provide some specific examples of how regression models connect the dependent variables (e.g., waste generation) with independent variables (population, housing, employment, etc.).

Regression Model Selection and Validation

This project tested over 20 combinations of independent variables. The goal was to identify a model with a high value of goodness-of-fit, low multicollinearity, and minimal differences between observed and predicted values. Figure E-30 compares results (i.e., waste quantity) from three models developed in this study (corresponding to Equations 2-4) to observed values in Illinois statewide studies in 2009 and 2015. It shows most of the model results were estimated within 5% of variance. In other words, the modeled values are consistently close to observed values. In most cases, Model 3 (or Equation 4) has better predictive power, compared to the other two models. Models 3 was also validated using data samples of specific material types in Boone and Winnebago counties (Figure E-30). Although some materials (e.g., food and C&D) show larger variances than material types, the models generally show good prediction results. The model for total waste shows a good fit overall.

Lastly, Figures E-32 and 33 show the predicted waste generation (excluding C&D) in Boone and Winnebago counties. The solid black lines show the modeling results in this study. The grey zone shows a 95% confidence interval. The red circles show the identifiable data points (reported values); some of which align with the modeling results very well. The outliers possibly involve inconsistent categories of waste definitions, as revealed in the text review of periodical reports in two counties. These differences also demonstrate the need of adopting and documenting consistent categories/definitions of waste inventory over time.

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Metrics

The Cost Benefit Analysis (CBA) performed by the NREL studied the feasibility of three WTE pathways, landfill gas capture, anaerobic digestion, and composting. For the purpose of determining the relationship between scale and feasibility the analysis was performed by taking three different sized systems into account. Waste disposal rates for the scenario originated from national EPA high, low, and average rates.

A majority of the analysis was conducted using national data. Data for Landfill Gases (LFG) costs and revenues were determined using the Landfill Methane Outreach Program (LMOP) Landfill Gas Energy Cost Model. For anaerobic digestion and composting, cost and revenue estimates were sourced from results on a national scale. Tipping fees, fuel and composting costs were sourced from 2021 pricing in Northern Illinois. Government incentives such as Renewable Identification Numbers (RIN) and California Low Carbon Fuel Standards (LCFS) were calculated using the Database of State Incentives for Renewables & Efficiency (DSIRE).

The Net Present Value (NPV) is calculated by taking the sum of both revenue and expenses. A positive NPV indicates profitability, while a negative value indicates debt. The sensitivity analysis for all pathways was performed by weighing the most impactful drivers of revenue and cost and taking the volatility of price into consideration.

It is important to note that while exact numbers were used in this analysis, there may be uncertainties that are unaccounted for in the results, such as the cost of transporting waste and dependent on the end use for Compressed Natural Gas (CNG), LCFS credits may not be an applicable revenue source. Additional context specific research should be conducted for sites in the region prior to any waste-to-energy developments to determine social, economic, and environmental feasibility for the site.

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