Regional Solid Waste Management

A Plan for
Boone & Winnebago Counties
2022 - 2042

Final Report, November 2022

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This document has been prepared by the Region 1 Planning Council in collaboration with its member agencies, partnership organizations, and local stakeholders.

This report was prepared in cooperation with the following:

University of Illinois-Chicago
Boone County
Winnebago County
The Solid Waste Advisory Committee

The contents, views, policies, and conclusions expressed in this report are not necessarily those of the above agencies.

AN ENGINE FOR COLLABORATION IN NORTHERN ILLINOIS

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Executive Summary

About

The State of Illinois Solid Waste Planning and Recycling Act (SWPRA) requires all Illinois counties to update their 20 year comprehensive solid waste management plan every five years. This allows counties to conduct a holistic assessment of area waste management practices and continually assess both short and long-term goals. The State of Illinois' Materials Management Advisory Committee (MMAC) provided guidance in a July 2021 Report to the General Assembly. Regional Solid Waste Management: a Plan for Boone & Winnebago Counties, hereinafter referred to throughout this document as "the Plan", was formed using this guidance in addition to supporting technical data, and local context.

Solid Waste Plan Elements

- Executive summary;
- Current plan implementation;
- Waste generation and volume data for currently managed materials;
- Existing infrastructure;
- Waste generation assessment;
- Existing diversion programs and recommendations for expanding recycling programs;
- Public education campaigns; and
- A summary of recommendations.

Waste Capacity & Infrastructure

Local waste infrastructure is limited mostly to traditional landfills, which are expected to reach full capacity by 2042, in the Illinois Environmental Protection Agency (IEPA) designated Northwestern Region. Landfill capacity estimates are approximate, as compounding and external factors present additional unknowns. The need for future waste reduction and diversion infrastructure is vital, as the concentration of waste in remaining landfills, along with the lack of existing recycling and diversion infrastructure present an increasing need for alternative disposal methods. Municipalities within the two Counties have various structures of waste collection. Larger jurisdictions have various direct agreements with private haulers funded through user fees. Residents outside of the larger municipalities self-select haulers and services, directly paying the hauler. In addition to private sector services, the public and non-profit sector provides diversion and recycling opportunities. Refer to Chapter 2: Current Plan Implementation Status for more detailed information.

High Level Diversion Goals (2042)

The following are high level, regional-scale goals that Boone and Winnebago Counties aim to achieve in the next 20 years.

Achieve a 95% traditional materials diversion rate.

Achieve a 85% non-traditional materials diversion rate.

Achieve a 85% organics diversion rate.

Overall Goal Structure

The 2022 Regional Solid Waste Management Plan for Boone and Winnebago Counties also contains short-term goals to incrementally support waste reduction efforts. Implementation goals, recommendations and actions are included within the following categories:

- Public Education & Outreach
- Circular Economy & Greenhouse Gas (GHG) Emissions
- System Organization & Administration
- Partnerships
- Policy
- Funding
- Traditional Materials Recycling
- Non-Traditional Materials
- Organics

Requirement List

Required Elements provides a full list of the MMAC's requirements, as the Plan is organized in an alternative format.

Organization of Document

Chapter 1: Introduction

The first chapter of the Solid Waste Management Plan describes the background and purpose of the document. Additionally, it describes the importance of data collection, updates, and details the development process. It concludes with describing the public engagement process, in addition to Solid Waste Advisory Committee efforts.

Chapter 2: Current Plan Implementation Status

Chapter 2 discusses Boone and Winnebago Counties previous Solid Waste Management Plans. The chapter includes a review of current programs, progress towards recommendations from recent plans, and a discussion of barriers to achieving the recommendations and how to overcome them. The chapter concludes with a discussion of issues, needs, and opportunities as a result from the public input survey.

Chapter 3: Existing Infrastructure Report

This chapter identifies existing solid waste management facilities such as landfills, transfer stations, and other waste collection facilities that are utilized by both Boone and Winnebago Counties, and how long these facilities will support current and future solid waste needs. The chapter concludes by discussing what vulnerable elements exist in the waste management system within Boone and Winnebago Counties.

Chapter 4: Waste Generation Assessment

Chapter 4 identifies both counties current waste generation rates and current diversion rates for local waste streams and waste water. The chapter concludes by discussing the environmental, economic, and social impacts of waste in Boone and Winnebago Counties.

Chapter 5: Proposed Material Management Programs

This chapter describes the facilities and programs currently existing, along with additional facilities and programs that are needed to support waste diversion efforts in Boone and Winnebago Counties. The waste types reviewed include traditional materials, organic materials, and non-traditional materials. The chapter concludes by discussing various programs that help address waste management outside of diversion efforts, disposal efforts, and waste projections for the area.

Chapter 6: Public Education & Outreach

Chapter 6 describes the efforts currently used to promote recycling measures and future recommendations through public education and outreach. The chapter concludes with goals and recommendations on recycling promotion strategies for Boone and Winnebago Counties.

Chapter 7: Partnerships, Policy & Funding

Chapter 7 is broken into three subsections: partnerships, policy, and funding opportunities. These subsections review new methods to increase and improve materials diversion and recycling efforts for the area. The partnership subsection focuses on community, private, and public partnerships that could be formed to improve recycling efforts in the community. The policy subsection reviews potential incentives to encourage recycling and waste diversion. The funding subsection identifies current funding sources and potential funding sources at the local, state, and federal level.

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

Appendix A: This report discusses initial waste utilization options to explore further with the supporting data from UIC and NREL.

Appendix B: Proposed Implementation Tactics & Timelines

Appendix B is a compilation of implementation efforts, who is responsible and what that timeline looks like.

Appendix C: Existing & Model Ordinances

Appendix C details relevant existing ordinances and sample ordinances other communities have implemented regarding waste management.

Appendix D: Glossary & Acronyms

Appendix D: Glossary of Terms is included to aid in the understanding and becoming familiar with solid waste management terms and acronyms.

Appendix E: Public Survey, Comments, & Data Methodology

This appendix details the results of the Solid Waste Management Survey, public comments on the specific plan, and data explanations for analysis, NREL and UIC data.

Appendix F: References

This appendix stores all sources referenced by roman number in the text.

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Chapter 1: Introduction

Background & Purpose

The purpose of the Boone and Winnebago County Regional Solid Waste Management Plan (hereafter referred to as the "Plan") is to provide a comprehensive assessment of the solid waste system in both Counties, and covers waste infrastructure, generation, programs, stakeholders, issues, needs, opportunities, policy, and funding. These elements inform future programs, goals, recommendations, and actions. All Illinois counties are required by the Illinois Solid Waste Management and Recycling Act (SWMRA) to have a 20-year solid waste management plan, in addition to providing five-year plan updates. Boone and Winnebago Counties agreed to collaborate on their new 20-year plan update, submitting one regional plan for both counties to implement collectively. This collaboration is most appropriate for several reasons including: Local waste disposal efforts often operate on a regional scale; waste collection is privately contracted in both counties; and waste from Boone County is regularly transported to facilities in Winnebago County.

Dates & Plan Updates

County Solid Waste Management Plans must be adopted 60 days after the public comment period has ended. The public comment period for this plan was from April 18, 2022 to May 18, 2022; therefore this Plan should be adopted by July 17, 2022.

Plan Development & Process

The Boone and Winnebago County Regional Solid Waste Management Plan 2022-2042 began with reviewing the recent "Illinois Materials Management Advisory Committee (MMAC) July 2021 Report to the General Assembly." This comprehensive report contains the following components:

- Committee recommendations on various statewide waste metrics and strategies;
- Background information regarding applicable laws, regulations, and terms;
- Materials management and generation in Illinois;
- Relevant materials management data and associated methodology; and
- New plan requirements for County Solid Waste Management Plans.

Following the review of this report, the MMAC Solid Waste Management Plan outline was modified to include the two counties as well as area-specific plan elements, such as Appendix A: A Report on Waste-to-Energy and Waste Utilization Options in the Rockford Region. Once the modified outline was approved by the counties, further research and data gathering occurred and a Solid Waste Advisory Committee (SWAC) was formed. This committee met regularly throughout the planning process to provide informed perspectives and feedback as the Plan developed. A public survey was then published to further understand area issues and general public opinion. The first public meeting was complementary to this effort, and informed the public of current plan progress. An additional public meeting was conducted to present the plan and provide an opportunity for area residents to discuss their thoughts, concerns, and questions. These meetings were held virtually due to the ongoing COVID-19 pandemic.

The Role of Data

Data for this Plan was sourced from many areas to provide insights on waste projections and area trends over time. The nature of locally privatized waste means that historic data may not be available or consistent across years due to varying definitions and other factors, so regression models were utilized to inform historic trends. Demographic and labor data sourced from the U.S. Census Bureau and regional economic modeling software was used to inform these projections.

Data Methodology Summary

Data availability for the Plan was significantly limited, as the most recent waste reports for both Boone and Winnebago Counties were from 2005 and 2010. Data collection for the Plan came from projection software, previous plans, key stakeholders, historic population, and employment data, performed in collaboration with the University of Illinois Chicago (UIC). Refer to Appendix E: Public Survey, Comments, & Data Methodology for more detail regarding UIC's methodology.

Waste Generation and Composition

This project developed regression models to predict waste generation and composition in Boone and Winnebago Counties based on local conditions. Regression models connect dependent variables (such as waste generation) with independent variables (such as population, housing, or employment). Adjustments were also made to allow the models to analyze for both residential and commercial sectors separately. Additional analysis was conducted to identify distinct characteristics in urban versus rural areas (discussed further in Chapter 4: Waste Generation Assessment (Local Waste Stream Impacts). 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 Adjusted R2),

validity (low multicollinearity), and differences of predicted waste generation rates compared to observed values.

Waste Diversion Scenario Development

For each scenario, overall diversion rates include all types of MSW materials (excluding construction and demolition waste) and reflect a weighted average using 2019 waste tonnage estimates. The diversion rates also factored in service coverage (specific materials accepted, recycled, or 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 is on average around 20 to 25 percent in many communities in northern Illinois. This study used 15 percent in the baseline scenario as a conservative estimate for Boone and Winnebago Counties.

Baseline Scenario (2019)

The Baseline Scenario was developed in reference to the reported data in Boone and Winnebago Counties, regional stakeholder interviews, and peer region performances. Due to the uncertain impacts of pandemic conditions, 2019 was chosen as the baseline year. The overall diversion rate was 18.2 percent.

Short-Term Scenario (2026)

The Short-Term Scenario with a 38.6 percent overall diversion rate was designed to be a feasible goal in the next three to five years in the study region. It aims to keep pace with national average rates of waste diversion and present best practices in Illinois.

Zero Waste Scenario (2050)

The Zero Waste Scenario adopts a 90.7 percent 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.

Environmental & Economic Scenario Impacts

The U.S. Environmental Protection Agency (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 (baseline versus a comparison) based on waste volume and management method. Users specify how much waste is managed through each of the applicable methods (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; and second, comparing the Zero Waste Scenario to the Baseline Scenario. In the model result, this study focused on three types of impacts: (1) carbon emissions measured by metric tons of carbon dioxide equivalent (MTCO2E); (2) energy consumption in metric millions of British thermal units (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 (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 converted the estimated labor hours to full-time equivalent jobs (FTEs) by a factor of 2080 hours/year (40 hours per week times 52 weeks).

Public Participation

Public Meetings

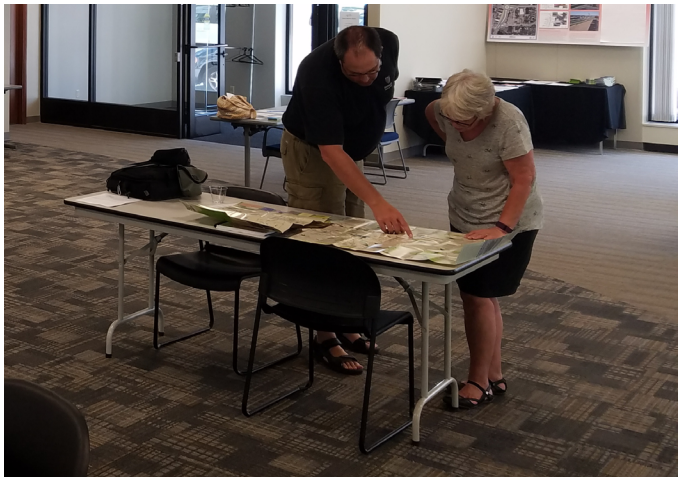
Throughout the Plan's development, R1 hosted two public meetings. The first public meeting took place on September 23, 2021, with a virtual open house where attending members of the public were informed about the Plan's purpose, current progress, and next steps. After an informative presentation, community members were asked to discuss their thoughts about waste in the two counties. The second public meeting took place on May 2, 2022, halfway through the public engagement period. This meeting included a presentation on the Plan draft and allowed for the public to ask specific questions.

Solid Waste Management Survey

In an effort to understand public perspective regarding waste collection, education, and impacts, a 27-question Solid Waste Management Survey was created and published for approximately 21 days. The digital survey yielded 106 individual responses from Northern Illinois residents in Boone and Winnebago Counties (see Appendix E for more information).

Public Comment Period

The public comment period took place from April 18, 2022 to May 18, 2022. A press release and social media posts were published to promote public engagement and feedback. During this time, five public comments were received. The list of public comments received can be found in Appendix E.



Community members at an open house in Northern Illinois.

Chapter 2: Current Plan Implementation Status

Previous Plans

Solid waste management implementation of the original plans began in Boone and Winnebago Counties in the early-to-mid 1990's. Previous data shows Boone and Winnebago Counties generated 33,213 and 188,500 tons of municipal solid waste (MSW) in 1990, respectively.[i,ii] Winnebago County's most recent 2016 update reported that an average of 453,926 tons of waste was generated in 2010. Recent data was not available for Boone County. Collection and accuracy of MSW estimates are impacted by several variables, including waste origins, lack of access to "proprietary" data, and a lack of local, historic waste data.

Additionally, the 1991 Winnebago County Solid Waste Management Plan and the 1992 Boone County Solid Waste Needs Assessment reports on both MSW and total solid waste (TSW) in order to ensure a complete analysis of waste composition in the region.[iii] TSW accounts for MSW along with landscape waste and sewage sludge.[iv] Data used by both plans included residential, commercial, and industrial wastes (with the exception of Boone County, which also included construction and demolition wastes).

Model projections based on historic data used in this Plan (due to a data gap between plan updates) estimate that in 2019, Boone and Winnebago Counties respectively generated 56,202 tons and 307,023 tons of MSW, excluding construction and demolition waste.[v] Due to the significant impacts solid waste management has on residents and their overall quality of life, several programs have been created by both municipalities and counties. The programs will be further outlined in this chapter, along with the state and federal policies that inform the programs.

Summary of Current Programs & Diversion Activities

Tables 2-1, 2-2, and 2-3 review the solid waste collection practices of Boone County's five municipalities and Winnebago County's 12 municipalities. While some smaller towns and cities do not provide online information, this visualization identifies what policies have been adopted. While all of the municipalities offer curbside garbage collection, not all provide more specialized services like electronic, pharmaceutical, or hazardous waste pickup. For the municipalities that coordinate these services, they are not usually available curbside. Many of the municipalities, in addition to Boone and Winnebago Counties, have collection centers for various recycling, e-waste, pharmaceuticals, and hazardous waste, or have other specific programs such as used medication drives.

Recycling Collection & Activities

Curbside recycling collection depends on location and service provider, but often occurs once per week. Cleaned and emptied recyclables (with lids removed) are to be placed loosely in designated containers, not in plastic bags or can liners. Certain municipalities (Village of Roscoe, Village of Winnebago, City of Rockford) allow excess recyclables to be put in paper bags on the curb next to the dedicated bin.

Progress of Current Plan Recommendations & Strategies

The following content describes the current achievements by both Boone and Winnebago Counties as outlined in the most recent plan updates. While there has been progress in some areas such as recycling efforts and source reduction. There has been less progress in combustion for energy recovery or combustion for volume reduction.[vi]

Boone County

Source Reduction

During a 2006 solid waste management plan update, Boone County chose not to set a specific municipal waste reduction goal due to a lack of data collection to measure source reduction impacts. Instead, the County decided to establish quantitative goals for future source reduction programming.

Recycling & Reuse

The private sector is mandated to provide the collection, marketing, and processing of residential recyclables from curbside recycling programs. The County, in coordination with Belvidere Township, supports the local recycling center.

Table 2-1. Recycling Pickup days by Jurisdiction

	MON	TUE	WED	THU	FRI
Durand					X
Lake Summerset	X*				
Poplar Grove	X				
Rockford**	X	X	X	X	
Village of Pecatonica			X		
Village of Winnebago		X			

**Lake Summerset offers residential recycling pickup on the first and third Monday of each month.*

***Rockford residents typically receive collection services once a week.*

Source: County, Municipality, and Hauler Sites

Table 2-2. Waste Collection Opportunities by Jurisdiction & Material

	Yard	Electronics (E-waste)	Medication Disposal	Curbside Collection	Bulk Pick Up	Hazardous Waste	Hauler
Boone County		X	X				Hauler of choice*
Belvidere	X		X	X	X	X	Hauler of choice*
Caledonia			X	X	X	X	Advanced Disposal; Republic Services
Poplar Grove	X			X	X	X	Advanced Disposal
Winnebago County		X	X				Hauler of choice*
Rockford	X	X	X	X		X	Advanced Disposal; Rock River Disposal; Republic Services
Machesney Park	X		X	X	X	X	Rock River Disposal
Durand				X		X	Advanced Disposal
Pecatonica	X	X		X	X		Advanced Disposal; Republic Services
Cherry Valley	X	X		X	X	X	Advanced Disposal
Lake Summerset	X			X	X		Gill's Freeport Disposal
Loves Park	X	X		X	X	X	Advanced Disposal; Rock River Disposal; Republic Services
Rockton	X		X	X	X	X	Advanced Disposal; Rock River Disposal
Roscoe	X		X	X	X	X	Advanced Disposal
South Beloit	X	X	X	X		X	Advanced Disposal; Rock River Disposal; Republic Services
Village of Winnebago	X		X	X	X		Gill's Freeport Disposal; Advanced Disposal

**Advanced Disposal; DC Trash; GFL Environmental; MDC Environmental Services; Prairie Land Disposal; Rock River Disposal (Commercial Only); Waste Management.*

Source: County, Municipality & Hauler Websites

Table 2-3. Curbside Recycling Conditions by Jurisdiction

Recycling Hours, Limits, & Guidelines	
Cherry Valley	• Recyclables must be placed curbside the night before, or prior to 6 a.m. on the scheduled day of collection.
Durand	• Recyclables must be placed curbside the night before, or prior to 6 a.m. on the scheduled day of collection.
Poplar Grove	• All recycling may be placed at the curb no earlier than 5:00 a.m. and no later than 6:45a.m. The morning of your scheduled collection day. Carts and containers must be removed from the curb by 9:00 p.m. the day of collection. • In addition to the cart, a resident may place out for collection each week an unlimited amount of containerized recycling. Additional recycling must be placed in either a resident supplied reusable container (clearly marked recycling) or plastic recycling bins in order to be collected. Resident supplied containers must be no larger than 33-gallons nor weigh more than 50 lbs. Oversized or overweight containers or recycling in plastic bags will not be collected. • There is a weight limit of 250 lbs for the Advance Disposal recycling carts.
Rockford	• Large cardboard and paperboard must be flattened and bundled with string or twine (not wire). Bundles should be no larger than two-feet by two-feet. • Residents may dispose of small electronics that are less than two-feet by two-feet in size in their City-issued blue recycling bins, with exception to televisions and computer monitors. • Excess recyclables may be put in paper bags on the curb next to the dedicated bin.
Roscoe	• Recycling should not be put at the curb until after 6:00 PM the night before pick-up. All recycling should be placed at the curb no later than 6:00 AM the day of pickup. • In addition to the cart, a resident may place out for collection each week an unlimited amount of containerized recycling. Additional recycling must be placed in either a resident supplied reusable container (clearly marked recycling) or plastic recycling bins in order to be collected. Resident supplied containers must be no larger than 33-gallons nor weigh more than 50 lbs. Oversized or overweight containers or recycling in plastic bags will not be collected. • Excess recyclables may be put in paper bags on the curb next to the dedicated bin.
Village of Winnebago	• Cardboard must be broken down in two-foot x two-foot sections and must be bundled or placed in a two-foot square cardboard box. • Newspapers, magazines, and other paper items must be bundled separately with string or placed in a paper bag. • Any items left in your bin after pickup will be classified as non-recyclable and will need to be placed in your garbage the following week. • Excess recyclables may be put in paper bags on the curb next to the dedicated bin.

Source: County & Municipality Websites

Combustion for Energy Recovery & Volume Reduction

Due to Boone County's small amount of waste generation, the high capital and operating costs associated with incineration, and the unclear regulatory atmosphere, incineration for energy recovery or volume reduction were not considered as viable alternatives and therefore have not been pursued.

Disposal in Landfills

Boone County relies on out-of-county landfill capacity for long term waste disposal. The County encourages private hauling companies to pursue private contracts for waste disposal services. Homeowners and businesses are responsible for subscribing to service from a private hauler.

Status of Current Implementation Efforts

The following activities were a result of recommendations. In 2005, Boone County entered into an agreement with One Source Recycling, located in Loves Park, IL to purchase and haul away all recycled materials. The County's waste assessment and needs were last explored in a 1992 Solid Waste Plan Survey.

Recommendations not Implemented

Recommendations such as source reduction programs, combustion for energy recovery, and combustion for volume reduction were not implemented due to budgetary reasons and lack of feasibility.

Winnebago County

Source Reduction

In the original Winnebago Solid Waste Management Plan, source reduction efforts were reportedly handled through private and non-profit organizations (Goodwill, Salvation Army, and Keep Northern Illinois Beautiful). Donation efforts do contribute to source reduction, as some products will be purchased and subsequently given an extended life. It should be noted that donation with limited criteria, results in a portion of donations being immediately landfilled due to quality issues.[vii]

Recycling & Reuse

The City of Rockford provides curbside recycling for 32 items and a curbside composting program for yard waste. However, private businesses and apartment buildings are responsible for contracting a waste hauler.[viii] County residents can dispose of household hazardous waste (HHW) items at a HHW Disposal Center located at the Four Rivers Sanitation Authority.[ix] KNIB also sponsors county-wide recycling events and has household recycling drop off sites in Machesney Park and Rockford.[x] Some programs have changed since the 1996 plan.

Combustion for Energy Recovery & Volume Reduction

The County conducted a feasibility study for a direct Waste-to-Energy (WTE) plant in 1992-1994.[xi] The plant was scheduled to begin operations in 1994-1996, but was never pursued. To date, no current WTE facilities exist. The original plan also did not consider any programs to address waste volume reduction only.

Disposal in Landfills

In the original plan, expansion of the Winnebago Landfill or siting a new facility were the primary waste disposal options presented. The Winnebago Landfill expanded in 1999 and 2009, and in 2012 Winnebago County approved the application of Local Siting Approval for an additional expansion. As of 2020, the capacity of the current operating units allow for 16 more years of operations.

Status of Current Implementation Efforts

Implemented Recommendations

- All recycling and reuse activities have been implemented. These activities include having the City of Rockford provide curbside recycling for residents, establishing a county HHW collection, and creating recycling drop off sites.
- Winnebago County reported that source reduction activities are being addressed in the private sector at this time.
- The last plan update stated the landfill capacity was expanded to meet current and future demand.

Recommendations not Implemented

- Combustion for energy recovery was determined to not be financially feasible.
- Winnebago County was unable to adopt a county-wide waste hauling agreement as identified in the original plan due to a change in Illinois state law in 2003 and 2004. The county did not proceed, as there was no mechanism to require participation without providing service at no charge.

Plans, Studies, & Programs Outside of the Service Area

While it is important to examine the solid waste management activity within Boone and Winnebago Counties, it is also helpful to review key plans and programs on a regional, state, and national level. The state and national guidelines will serve to inform local efforts and to inspire new plans, studies, or programs. Since all Illinois counties are mandated by the same guidelines for waste management planning, the standardization allows for accountability in the reporting of these methods, goals, and metrics.

Local & Regional Efforts

Located south of Boone and Winnebago Counties, Ogle County has a smaller population than both and works to promote a healthy environment through the safe collection and disposal of waste.[xii] Similar to Boone and Winnebago Counties, Ogle County developed a Solid Waste Management Plan in 1990, which included a needs assessment, study of current management options, and a 20-year plan. Since then, both five-year and 20-year updates have been completed, as well as a draft 2021 plan update. Both the original plan and 20-year update provided recommendations on developing several initiatives such as education and recycling programs, record keeping and reporting, landfill permits, and various grants to fund the implementation of waste reduction activities. Other funding is available to Ogle County through landfill surcharges and fees and general revenue funds. Nine of the 11 municipalities in Ogle County offer residential and curbside garbage and recycling collection through contract. The Orchard Hills Landfill, located in Davis Junction, also has a drop-off recycling station open to the public. Four annual landfill capacity reports and various municipal laws and regulations are publicly available online, similar to Boone and Winnebago Counties. Ogle County's Solid Waste Management Department is a comprehensive, successful division that provides its citizens with information on disposal options for both every day and specialty items, updates on recycling efforts, policies, and other resources.[xiii]

State Efforts

Reports

The IEPA publishes an annual Landfill Capacity Report on disposal capacity for active Illinois landfills. The most recent report from August 2021 provides data for a total of 36 landfills, including those in Region 1 in Northwestern Illinois. Details on these sites include maps of the region, the volumes of waste accepted, and the remaining waste capacities of the landfills from that calendar year. For Region 1, the Winnebago Landfill reported to have a life expectancy of 16 years and the Orchard Hills Landfill reported a six-year life expectancy.

Additionally, the IEPA identifies hazardous waste sites in the Illinois Hazardous Waste Annual Report. These include generation, treatment, storage, and disposal sites, as well as the types and total quantities of hazardous waste. The last publication from 2015 reported one of these storage sites in Winnebago County: Clean Harbors Pecatonica, LLC in Pecatonica. The Illinois legislation that initiated the creation of these two respective reports, the Illinois Solid Waste Management Act and the Resource Conservation and Recovery Act, will be reviewed thoroughly in Chapter 7: Partnerships, Policy, & Funding.

The 2021 Illinois Materials Management Advisory Committee (MMAC) Report to the General Assembly is another important document for the state, serving as a comprehensive framework for current and future waste management opportunities, along with achievable landfill diversion goals. The MMAC Report was heavily referenced throughout the development of the Plan for Boone and Winnebago Counties, including within the analysis of education, infrastructure, material markets, and recommendations components. The other work that the Illinois MMAC is dedicated to will be covered later in this chapter.

Programs

The IEPA has several programs to address waste management, reduction, and diversion strategies. Among these programs, the IEPA's Materials Management Unit (MMU) supports diversion programs and general education on recycling and waste collection. The MMU oversees specific material recycling including E-waste and composting programs, and facilitates disposal of other items once they are no longer recyclable. The Illinois state government partners with local entities (government, non-profit, and others) throughout Illinois to hold four HHW collections each year in rotating locations. The IEPA works with the organization to package, transport, and dispose of the waste collected at these events, and also runs and operates four long-term collection facilities in Illinois. The IEPA partners with collection sites to hold medication take back programs with select hours or 24/7 disposal boxes, reducing medication from local water streams.[xiv] Similarly, the State Response Action Program hosts cleanup programs at various sites (such as former landfills, manufacturing plants, or agrochemical facilities) where the natural environment has been contaminated by hazardous material and threatens community and environmental health.[xv]

As a result of Governor Pritzker's amendment to the Illinois Solid Waste Management Act, a Materials Management Advisory Committee (MMAC) was formed in 2019 (see Chapter 7 for more information). The MMAC advises the Illinois General Assembly on materials, policy, processes, and planning efforts related to waste management. There are five subcommittees within the MMAC:

- Education and Outreach;
- Infrastructure Development;
- Local Government Support;
- Markets Development; and
- Measurement.

MMAC Report to the General Assembly

As mentioned above, the State of Illinois formed a Materials Management Advisory Committee made up of a variety of stakeholders to advise policy, process, and planning efforts related to waste management. During the MMAC's collaboration, numerous formal recommendations were presented to the Illinois General Assembly for adoption. Copies of these formal recommendations are included in Attachment C of the MMAC report. The recommendations are intended to meaningfully enhance the volume of material diverted from Illinois landfills. A few of these recommendations include:

- Establishing statewide landfill diversion targets of 40 percent by 2025, 45 percent by 2030, and 50 percent by 2035 (current rate is 37 percent);
- Employing a stratified approach to strategically target materials for diversion from Illinois landfills;
- Increasing statewide support from existing funding and without additional revenue for materials management programs by as much as $3.375 million per State Fiscal Year by State Fiscal Year 2027-2028;

- Creating a Statewide Market Development Advisory Board to review and approve viable public and private sector diversion projects to receive state support;
- Appropriating funding to support the statewide recycling and composting infrastructure grant programs;
- Enhancing the level of state support for household hazardous waste collections;
- Developing and continuing to support a statewide materials management education campaign;
- Developing sophisticated data management systems within state government to track and map landfill diversion opportunities available to the public; and
- Adopting a consistent and simplified statewide approach to local government solid waste and materials management planning and reporting.

National Efforts

The Environmental Protection Agency (EPA) has also federally implemented a variety of policy and programming efforts concerning safety and sanitation regulations for waste disposal, collection, and recycling within the United States. The Universal Waste Program details management standards for five types of commonly generated hazardous waste: batteries, pesticides, mercury-containing equipment, lamps, and aerosol cans. While not included in the 1995 Universal Waste Rule, some states include additional materials in their universal waste programs such as antifreeze and paints. Participants regulated by this system include small and large quantity handlers of universal waste, universal waste transporters, and universal waste destination facilities. Illinois adopted the 1995 federal program and was also authorized by the EPA to implement it. The regulations within this program involve storage, disposal, and management of the universal wastes listed above.

Similarly, the U.S. General Services Administration (GSA) manages and disposes of the solid waste produced in its federal buildings, and publishes its performance results in an annual Sustainability Performance Plan. Each regional office has its own reuse, recycling, and composting programs and requirements, but each GSA building has a diversion goal of 50 percent of all solid waste. GSA also has an interactive Sustainable Facilities tool for the public to learn more about the GSA's use of materials and resources.[xvii]

Issues, Needs & Opportunities

Solid waste management serves a vital role in the health and safety of every community. To better serve the community, it is important to address factors that may be inhibiting solid waste management. A majority of the issues, needs, and opportunities presented in this subsection were identified through a public meeting and survey, in addition to stakeholder feedback.

Key Issues & Needs

Boone County

Boone County has limited recycling and non-traditional waste disposal programs beyond self-selected curbside recycling services. Boone County residents must travel outside the County to access a recyclable drop off site or pay the added cost of a recycling service. This presents an issue for dealing with hard-to-recycle materials that are not accepted for curbside pickup. Individuals who have constraints such as insufficient finances or lack of transportation may not be willing or able to travel long distances to properly recycle select materials.

In order to encourage more waste diversion practices in Boone County, accessible waste diversion infrastructure is crucial. Drop-off sites to dispose of recyclable materials for those who cannot or do not have curbside recycling are needed. Boone County also does not have any compost facilities that accept food waste, with only landscape waste and wastewater treated by the sanitation district in Belvidere.[xviii] The establishment of drop-off or curb-side compost programs in the area could be beneficial in reducing the quantity of organics landfilled.

Currently, there are no permanent or long-term HHW drop off locations in Boone County. This demonstrates a need for increased availability of drop-off locations. However, for rural or lower population areas, it may not be feasible to have a permanent drop-off location. If such is the case, temporary waste collection sites can be established in the area.

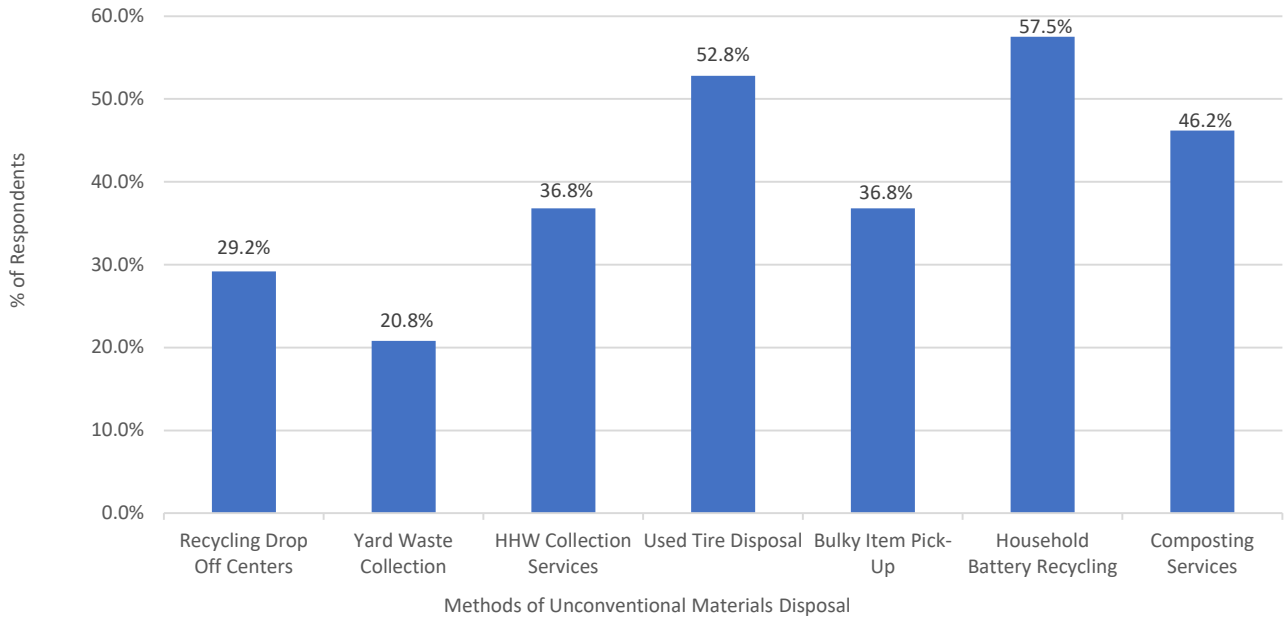
Winnebago County

There are only two drop-off recycling sites in Winnebago County, both of which are run by the not-for-profit Keep Northern Illinois Beautiful (KNIB). These sites accept household recyclables, and for a small fee will dispose of unwanted electronics. Accessibility to these two sites could pose an issue for those who do not have reliable sources of transportation or funds to dispose of electronics. Expansion of the current recycling systems could help combat this issue.

Residents of Boone and Winnebago Counties were given the opportunity to voice their concerns by completing the Solid Waste Management Survey (see Appendix E). The purpose of this survey was to provide further insight on public engagement and impacts pertaining to the regional solid waste management system. The results demonstrated that residents living near the landfill are impacted by high volume of hauler traffic and an unpleasant odor originating from the landfill. Citizens report that trash haulers bound for the landfill unintentionally drop trash onto the streets and present an odor nuisance.

Winnebago County also experiences other important issues, largely as a result of the Winnebago Landfill located within the County. One concern raised in SWAC meetings and in the public survey was the life expectancy of the Winnebago Landfill. It is calculated that this landfill only has 16 years left until it reaches its capacity.[xix] Limited landfill capacity, quality of life impacts, and best practices indicate a need for increased waste diversion and source reduction programming.

Figure 2-1. Unfamiliarity with Recycling & Disposal of Unconventional Materials



Source: Solid Waste Management Survey 2021

Illegal Dumping

Illegal dumping remains a concern for both Boone and Winnebago Counties. The issue of illegal dumping refers to the disposal of waste in an unapproved or dangerous manner. It is often characterized by piles of waste and bulky items left beside streets, vacant areas, and even neighborhoods. Common illegally dumped items such as large furniture, appliances, and tires may be an eyesore, and in severe cases can cause local property values to drop.[xx] Illegally dumped hazardous materials that have toxic, corrosive, flammable, or reactive properties threaten the health and safety of humans and the environment.

The solid waste management system must adapt to reduce the amount of illegal dumping that occurs. Local policy and programming may address this by reducing barriers to proper waste disposal. This can be accomplished by targeting frequently illegally dumped materials such as tires and electronics.

Lack of Education

A key barrier observed in both counties was lack of education concerning proper waste management practices. This is indicated in the results of the Solid Waste Management Survey, in which a lack of education for how to recycle materials and where to do so was identified. Twelve percent of survey respondents reported that they recycled plastic shopping bags through their curbside recycling program. This presents an issue, because curbside recycling programs do not accept plastic bags and they must instead be brought to an appropriate location.

Increased public education efforts could result in improvements of the overall solid waste management system, and there is a need for educational outlets residents can utilize to ensure proper disposal of materials.

Landfill Environmental Risks & Closure

Inactive landfills are monitored for 30 years post closure, as they still pose a threat to human health and the environment. Federal regulation (40 CFR § 258.61) outlines certain criteria landfills pending closure must follow.

Landfill closure care must be conducted for 30 years after the site has closed, unless the Director of an approved State deems that another time frame is more appropriate for the site. Post-closure care of a landfill must fulfill the following requirements:[xxi]

- A final cover must be installed on top of the landfill. This cover must be repaired and maintained regularly to ensure that it remains effective.
- So long as leachate from a particular site is deemed to be a threat to human health or the environment, a leachate collection system must be implemented and maintained. The Director of an approved State may provide approval to cease leachate collection, if it is determined it no longer poses a threat.
- Ground water monitoring must be conducted if it is determined there is a chance of possible contaminant migration into groundwater.
- Operation and maintenance of gas collection systems.

The requirements set forth for landfills closures are not impenetrable safeguards for contamination. The final cover may eventually begin to fail over time. This could result in escape of gases that should be captured by the on-site gas collection system. It is also possible for water to permeate through the cover, generating leachate, and for the landfill liner to eventually begin to fail, allowing for the leachate to contaminate groundwater.[xxii] It is for this reason that landfills, even those that are no longer operational, are continually monitored.

Landfills that appropriately conduct post-closure procedures and are deemed to no longer pose a significant threat to the environment may be repurposed. The large open land areas that result from landfills can be used to develop recreational areas, parking lots, or other developments to benefit the community, so long as these activities do not interfere with the integrity of the landfill closure systems.[xxiii]

Legislation & Price Changes

The regional solid waste management system is vulnerable to legislative changes that are above the scope of the region. Changes to state, national, or even international legislation have the ability to impact the economic feasibility and accessibility of the region's waste disposal and recycling system.

Perhaps one of the most notable legislation changes occurred when the People's Republic of China's 2018 "National Sword" Policy was enacted. Prior to its enactment, 70 percent of the recyclable plastic that was collected in the U.S. was exported to China.[xxiv] The policy does not explicitly prohibit the importation of recyclable solid waste, but rather increases restrictions on the quality of the waste accepted. This policy limited the amount of plastics the U.S. could divert previously. This resulted in recyclables accumulating, and national recycling cost increases due to local labor, infrastructure, and transportation costs differing.

Addressing Equity

The Center for Disease Control's 2018 social vulnerability data for Boone and Winnebago Counties showed those with higher social vulnerability percentiles tend to live within the more urbanized areas of Rockford and Belvidere. In Rockford, the census tracts with a higher social vulnerability score are located predominantly to the West and South of Rockford's downtown center. The Winnebago Landfill is not near these socially vulnerable tracts, nor are any waste diversion sites. Sites for solid waste disposal are primarily located in census tracts with a low social vulnerability score and low minority population.

A key consideration when addressing equity is that the ability for an individual to choose more sustainable waste diversion options is often a privilege. For instance, low/fixed income, black, and ethnic communities are disproportionately located in food deserts: areas that lack close access to fresh food. Stores that sell food in these areas are often limited in variety and may not provide healthy or environmentally sustainable options.[xxviii] Locations with sustainably packaged/produced goods are often more expensive than traditional products. Individuals with a low or fixed income may be effectively priced out of some source reduction practices. Furthermore, individuals face the combination of cost barriers to source reduction and diversion such as: transportation (access and cost), access to a store that sells affordably priced products with low/zero waste infrastructure, large up-front costs for reusable goods and (membership based) bulk purchasing. Furthermore, limited income makes curbside or drop-off efforts impractical or impossible due to cost and transportation barriers.

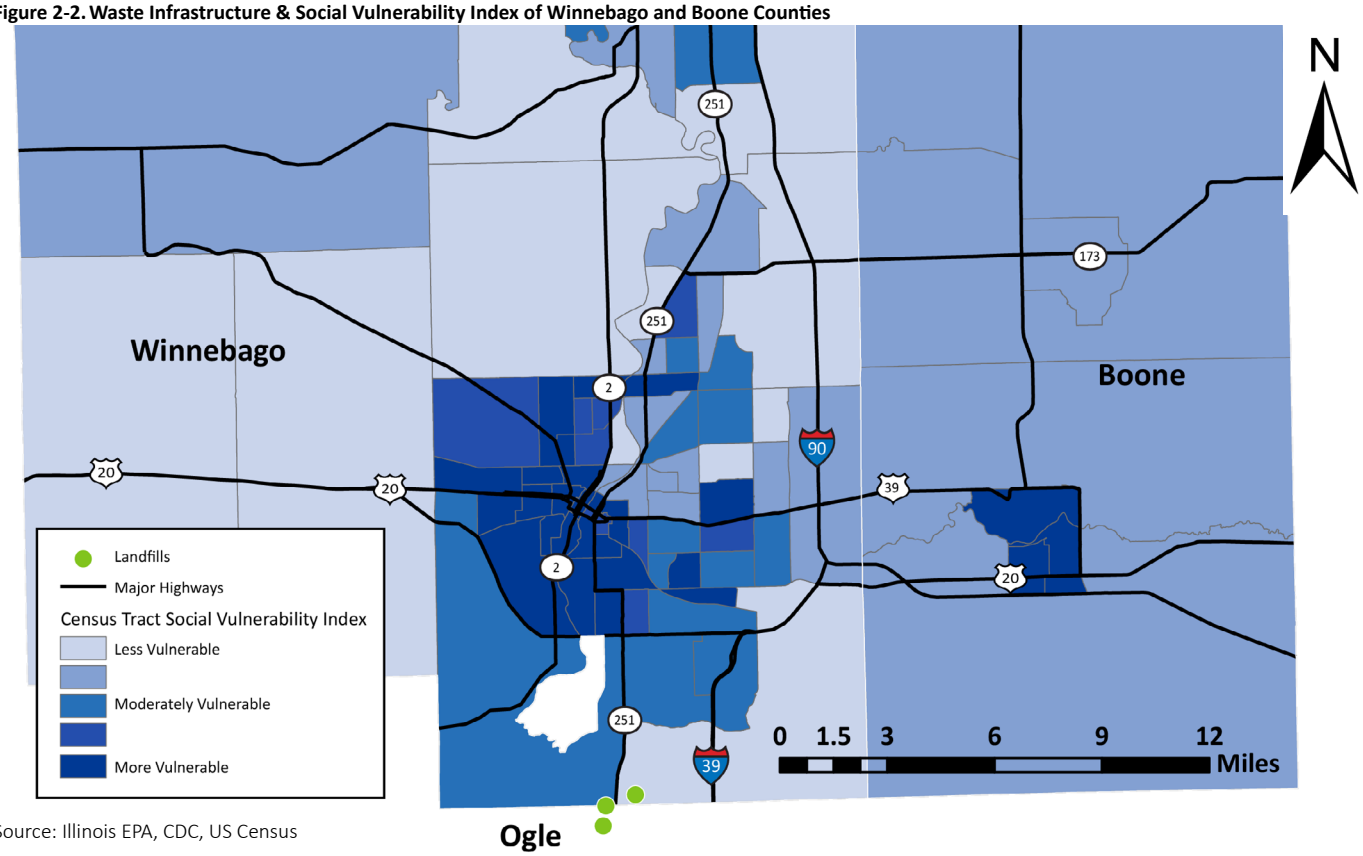
Uncertain Future Waste Capacity

Currently, Boone and Winnebago Counties have few diversion opportunities in the form of facilities and services. Although both counties are in an IEPA designated region tied with the highest quantity of landfills, remaining capacity is relatively low. There are no public plans for an expansion for any landfills within Winnebago County or the surrounding counties.

Emerging Opportunities

The regional solid waste management system has the potential to be a driver of economic development for the local community. Currently, opportunities exist that can help the solid waste system become a more profitable and environmentally-sustainable entity. Food and organic waste are excellent candidates for WTE facilities, which could add to the region's already diverse energy portfolio. Collaborative opportunities with ongoing sustainability-driven initiatives are also possible. As the prevalence of electric vehicles (EVs) in the region increases, so does the need for sustainable energy sources to power them.

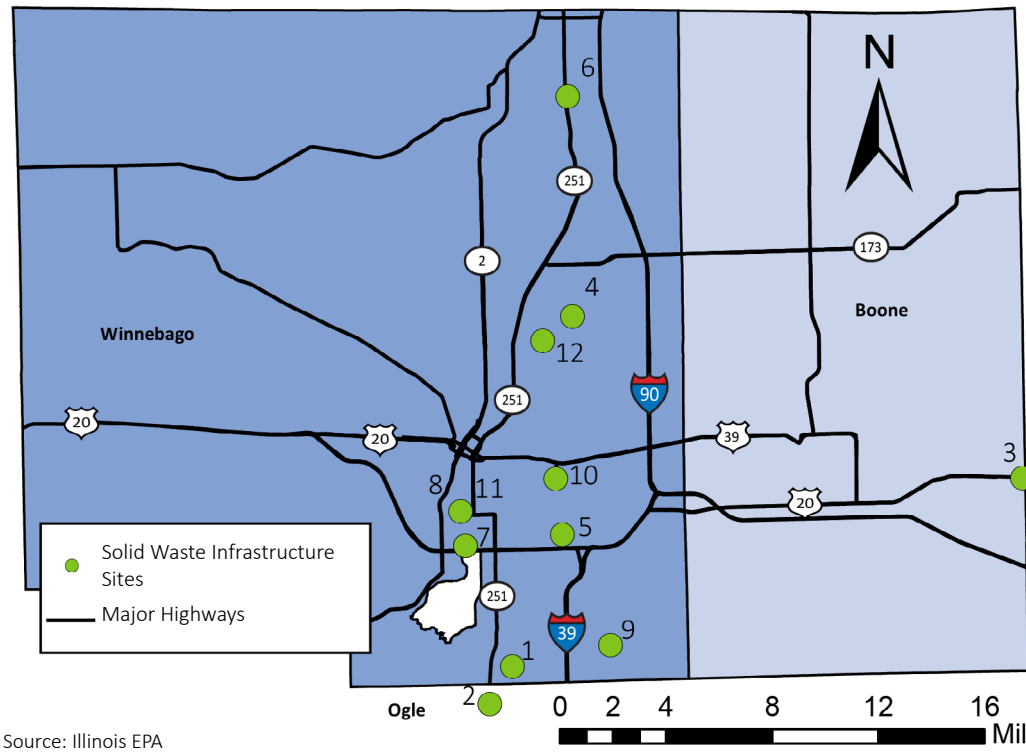
Figure 2-2. Waste Infrastructure & Social Vulnerability Index of Winnebago and Boone Counties



Source: Illinois EPA, CDC, US Census

Chapter 3: Existing Infrastructure Report

Figure 3-1. Existing Infrastructure Map



Site Name	#
Winnebago Landfill	1
Orchard Hills Landfill	2
Garden Prairie Organics	3
Paper Recovery Service Corp	4
Keep Northern Illinois Beautiful	5
Roscoe Transfer Station	6
City of Rockford HHW Site	7
Four Rivers Sanitation Authority	8
Rock River Valley Composting Facility	9
City of Rockford Yard Waste Collection	10
Area Salvage and Recycling	11
Cimco Resources, Inc.	12

Source: Illinois EPA

Existing Landfills Utilized by Counties

The Illinois Environmental Protection Agency (IEPA) has seven administrative regions within the state, covering 36 landfills. Boone and Winnebago Counties are located within the Northwest (NW) IEPA administrative region. This region is tied with the Peoria IEPA administrative region for the highest number of landfills at seven each.[i] However, the NW Illinois region has nearly triple the remaining landfill capacity post-compaction in comparison to the Peoria region (145.3 million yd^3), a higher disposal volume than the other six administrative regions (6.8 million yd^3), and the highest current five-year average of waste disposal (6.6 million yd^3).[ii] Although this region has the highest reported remaining capacity among the seven administrative regions in Illinois, it also has the lowest landfill life expectancy (22 years), alongside East St. Louis (22 years), and the Chicago Metropolitan area (nine years).

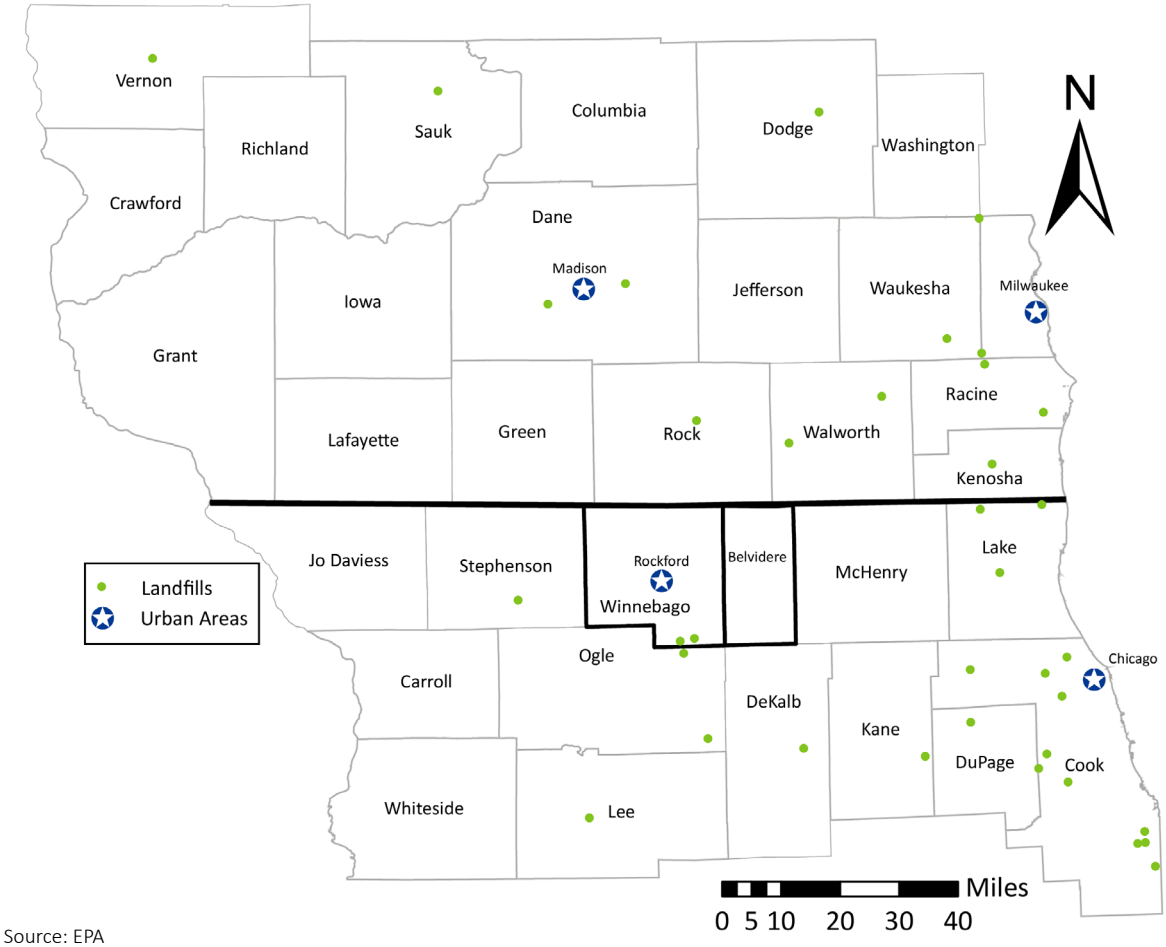
Winnebago Landfill, owned and operated by Waste Connections, has the largest reported remaining capacity (47 million yd^3), the largest disposal volume (2.8 million yd^3), and the largest current five-year average disposal volume (2.4 million yd^3) in the region. Winnebago Landfill also has the second lowest life expectancy in the region (16 years).[iii]

This landfill is located in the southern portion of Winnebago County, and is close to Orchard Hills Landfill in bordering Ogle County. Winnebago Landfill's last reported expansion approval was in 2012 for a 222-acre addition within its 855-acre facility boundary.[vi]

Waste Management (formerly known as Advanced Disposal Services Inc.) operates the sole transfer station in Winnebago County, located in the Village of Roscoe. The facility accepts the following items: municipal solid waste, shingles, roofing materials, yard waste, and construction/demolition materials.[v]

Though there are separate centers, neither of these sites contain a recycling drop off center. This indicates a lack of connected systems within the area's existing traditional pollution control facilities.

Figure 3-2. Landfills in Northern Illinois & Southern Wisconsin



Source: EPA

Summary of Other Facilities Utilized by Boone County

Currently, Boone County residents must travel to neighboring counties to recycle or divert solid waste from the landfill for items that cannot be collected through curbside recycling, unless the specific diversion site offers hauling services to collect the waste. However, this is still a significant distance for haulers to routinely travel from homes in Boone County to non-landfill solid waste management sites in Winnebago County or other neighboring counties. Like the vast majority of other Illinois counties, Boone County is expected to experience population growth in the coming years, making infrastructure for solid waste management diversion systems essential. Extended distances between residents and reliable diversion sites is a barrier to waste diversion and further constrains the shrinking capacity of regional landfill infrastructure.

Composting Facilities

Garden Prairie Organics, LLC

Garden Prairie Organics accepts compost from several local municipalities, landscape architects and commercial landscapers, garden centers, golf courses, road construction contractors, local farmers, and the general public. The company produces general compost for agriculture and golf turf, and arranges for trucking and delivery of their products.

Winnebago Landfill

Winnebago Landfill accepts municipal and commercial yard waste (through individual drop-off and curbside collection).

Summary of Other Facilities Utilized by Winnebago County

Materials Recovery Facilities

Paper Recovery Service Corp (PRSC)

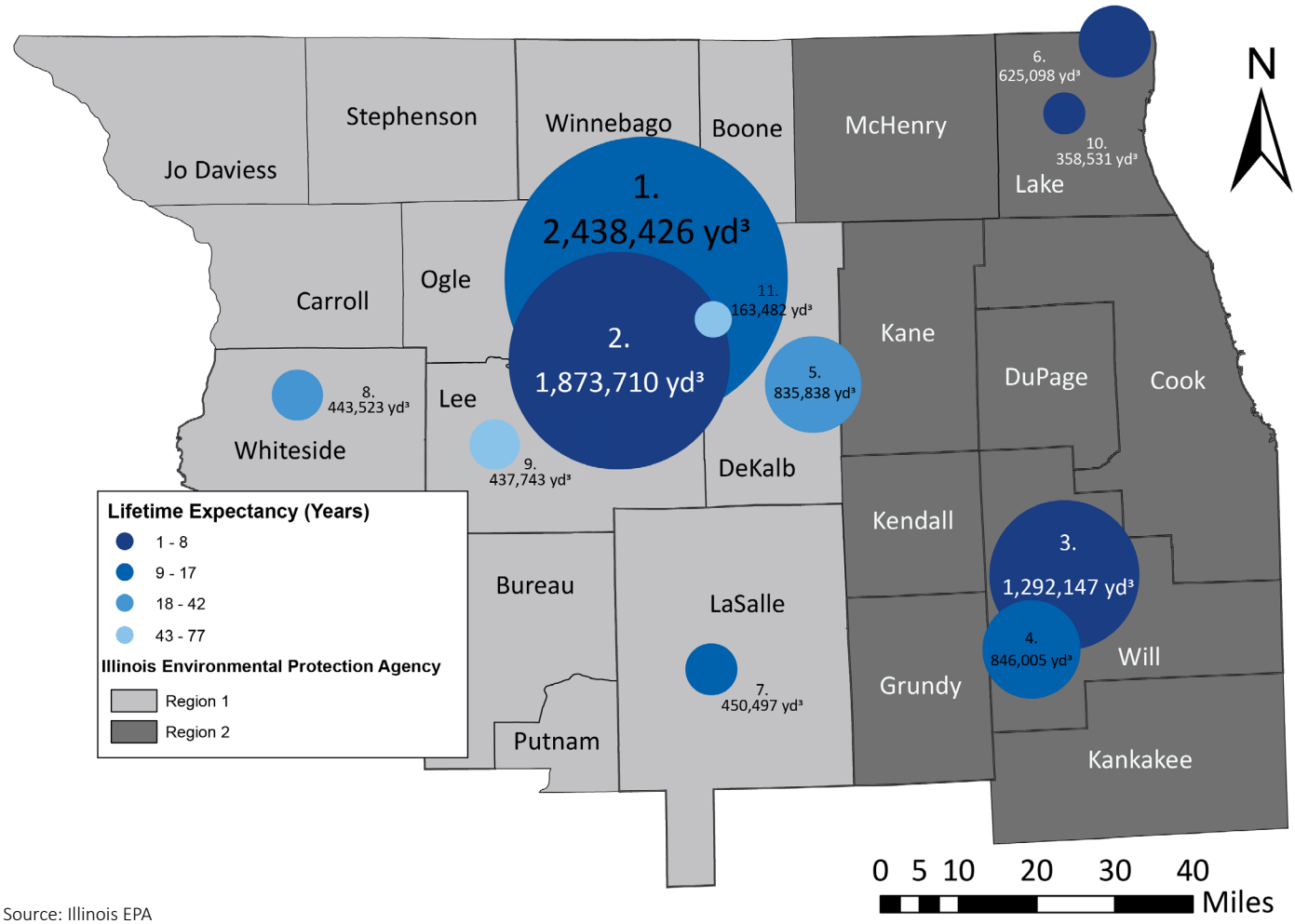
PRSC offers document and hard drive shredding, on-site paper shredding, cardboard, scrap metal, and aluminum recycling, and paper breakdown services. This 75,000 square foot facility purchases large amounts of cardboard from local and large businesses as well as aluminum cans and scrap metal. Their drop-off center is open to the public.

Recycling Centers

Keep Northern Illinois Beautiful (KNIB)

There are two KNIB locations in Winnebago County open to the public. Both locations take a wide variety of waste items including flags, clothes, paper, cardboard, appliances without refrigerant, and small electronics. These facilities also take larger electronics and other E-waste with a fee.

Figure 3-3. Landfill Capacity & Disposal Volume in Northern Illinois & Southern Wisconsin



Source: Illinois EPA

Table 3-1. Landfill Capacities in IEPA Regions 1 & 2

Rank	Region	Name	Address	Disposal Voume (Y³) (5-Year Averages)	Lifetime Expectancy (Years)
1	1	Winnebago Landfill	8403 Lindenwood Rd, Rockford, IL 61109	2,438,426	16
2	1	Orchard Hills Landfill	8290 IL-251, Davis Junction, IL 61020	1,873,710	6
3	2	Laraway Recycling and Disposal Facility	21101 W Laraway Rd, Elwood, IL 60421	1,292,147	5
4	2	Prairie View Recycling and Disposal Facility	29755 S Prairieview Dr, Wilmington, IL 60481	846,005	17
5	1	Dekalb County Landfill	18370 Somonauk Rd, DeKalb, IL 60115	835,838	29
6	2	Zion Landfill	701 N Green Bay Rd, Zion, IL 60099	625,098	8
7	1	LandComp Landfill	2840 E 13th Rd, Ottawa, IL 61350	450,497	17
8	1	Prairie Hill Recycling and Disposal Facility	18762 Lincoln Rd, Morrison, IL 61270	443,523	42
9	1	Lee County Landfill Inc.	1214 S Bataan Rd, Dixon, IL 61021	437,743	77
10	2	Countryside Landfill Inc.	31725 IL-83, Grayslake, IL 60030	358,531	5
11	1	Rochelle Municipal Landfill No. 2	6513 S Mulford Rd, Rochelle, IL 61068	163,482	63

Source: Illinois EPA

Transfer Stations

Roscoe Transfer Station

Roscoe Transfer Station is owned by Advanced Disposal, which is a subsidiary of Waste Management. Roscoe Transfer Station is located northeast of Roscoe between Highway 251 and I-90. The drop off center is open to the public and accepts number one and number two plastics, glass bottles, aluminum, metals, and paper. As a subsidiary of Advanced Disposal, they also offer pickup services, which can be arranged through Advanced Disposal's website.

Household Hazardous Waste Collection Facilities

City of Rockford Household Hazardous Waste Site

Located just north of the Four Rivers Sanitation Authority's office, the City of Rockford Household Hazardous Waste site accepts a variety of hazardous residential waste items on weekends, including aerosols, corrosives, oxidizers, solvents, oil-based paints, waste oil, pesticides, fertilizers, non-alkaline batteries, and fluorescent lamps. Waste generated from a commercial source, or volumes larger than five gallons, are not accepted. This site is open to the public.

Four Rivers Sanitation Authority (FRSA)

Formerly the Rock River Water Reclamation District, FRSA provides waste water treatment services for the Rock River Watershed, which includes most of Winnebago County and part of Boone County. Currently serving 77,000 residential, commercial, and industrial customers, FRSA treats 40 million gallons of contaminated waste water daily, converts 11,000 tons of solid waste into a locally-available bio-solid fertilizer each year, and generates 70 percent of the electricity needed to operate the facility with naturally produced methane gas.[vi]

Composting Facilities & Services

Rock River Valley Composting Facility

The Rock River Valley Composting Facility, a part of the Winnebago Landfill, accepts only landscape waste (such as grass clippings). It is only open between April and November. The facility makes no distinction between residential and commercial landscape waste, but given a $50 per ton of waste disposal fee, with a two-ton minimum charge, residents are unlikely to utilize the facility. However, it is open to the public.

City of Rockford Yard Waste Collection

City of Rockford yard waste collection occurs only during Spring, Summer, and Fall. Collected yard waste is taken to the Rock River Valley Composting Facility, near the Winnebago Landfill.

Scrap Metal Facilities

Area Salvage & Recycling

Area Salvage and Recycling offers compensation for scrap metal, machinery, and vehicles. Metals accepted include copper, aluminum, batteries, cast and lead, brass (all types), catalytic converters, computer equipment, and appliances. The site is open to the public.

Cimco Recycling Loves Park, Inc.

Cimco Recycling Loves Park purchases all grades of ferrous and non-ferrous metals. This facility, which is open to the public, also provides trailer, lugger, and roll-off services for manufacturing facilities throughout the Rockford and southern Wisconsin areas, while also receiving and shipping bulk scrap and recyclables via the Union Pacific Railroad. Cimco is headquartered in Rockford with seven facilities spread throughout Illinois and Wisconsin.

Future Outlook with Current Infrastructure

As of 2020, the population of Boone and Winnebago Counties was 338,789 residents.[viii,ix] Migration to the region and population growth within both counties are not expected to increase dramatically between 2020-2040.[x] The combined Winnebago and Boone Counties population projections display a 2.67 percent population increase between 2020 and 2040. It should be noted that Winnebago has a much larger population, though the County's population is projected to decline. Boone County is projected to increase in population during this time, with a subsequent increase in waste generation.

Including both counties, less than 10 percent (9.7 percent) of the population lives in rural areas, with the vast majority of residents in urban areas.[xi] The top two urban areas are Rockford (43.8 percent) and Belvidere (7.3 percent). Urban areas generate about 93 percent of waste in both counties and urban waste is projected to increase in urban areas from 2020-2040. Per capita waste generation in 2019 was 0.5 tons per person per year for urban residents, 0.6 tons per person per year for urban commercial entities, 0.4 tons per person per year for rural residential residents, and 0.35 tons per person per year for rural commercial entities.

Between 2020 and 2040, waste composition is not projected to change significantly in the region's rural and urban areas. Paper is the largest percentage of overall waste products for both urban (751.1 pounds per person per year) and rural (386.6 pounds per person per year) individuals. Within Boone and Winnebago Counties, three facilities accept paper, with one of them specifically for shredding and recycling documents. The current capacity of these facilities is unknown. Solid waste diversion infrastructure is limited for both counties. While there are two composting facilities, only one accepts food and other organics aside from grass and lawn clippings. Like many commercial and industrial facilities, exposure to COVID-19 has prompted changes that have created logistical bottlenecks, further reducing the capacity and rate at which solid waste can be diverted.

Even without a projected increase in population, with current solid waste habits and trends, the existing landfill infrastructure will not be adequate for the region's needs. It can take up to five years to plan a landfill facility and 10 years to go through the permitting process. Due to the lack of requirements for private solid waste management firms and diversion facilities to provide public capacity and disposal volume reports, the future capacity of non-landfill solid waste infrastructure in Winnebago and Boone Counties remains somewhat unclear and in need of further investigation.

The average landfill life expectancy of the Northwest administrative region is 22 years. For Boone and Winnebago Counties specifically, the two nearest landfills, Orchard Hills Landfill and Winnebago Landfill, have life expectancies of six and 16 years (both as of 2020), respectively. As of Fall 2021, there are no public plans for expansion of either facility. The current solid waste system primarily utilizes landfills near the end of their capacity. Although the region will most likely not encounter a population increase in line with the U.S. average over the next 20 years, the issue of limited landfill capacity still exists. Solutions such as source reduction, routing to higher capacity landfills, or the construction of new infrastructure can help to mitigate this problem.

Key Solid Waste Management System Vulnerabilities

The current solid waste management system in Boone and Winnebago Counties consists of many entities working towards the legal and efficient disposal of waste. A system of this level of scale and complexity is likely to face challenges and vulnerabilities, some of which are outlined further in the subsections below.

Infrastructure Life Expectancy

The limited life expectancy of the region's landfills poses a significant vulnerability to the solid waste management system. The life expectancy of a landfill is determined by how much available capacity the site has left. As landfills reach capacity, the solid waste management system may become strained. When a landfill closes, other surrounding landfills frequently absorb the waste materials the closed landfill would have previously accepted. This then impacts the life expectancy of the surrounding landfills, as they must take in more waste and will reach capacity more quickly. Of the seven landfills located in Northern Illinois, the Winnebago landfill site has the largest remaining capacity but the second shortest lifetime expectancy (16 years). This is attributed to the high disposal volume of the landfill site, which is the highest of the seven landfills. It is estimated that the five-year average disposal volume is 2.4 million cubic yards post-compaction for this site.[xii] Permitting and construction of a new landfill is a lengthy process that can take anywhere from 10-20 years. The high disposal rates of this landfill site and it's remaining limited capacity makes the region's solid waste management system vulnerable to future issues. When this site reaches capacity, zero waste infrastructure will be vital to avoid longer disposal trips.

Lack of Waste Diversion

Another potential vulnerability in the current solid waste management system of Boone and Winnebago Counties is the quantity of recyclable materials landfilled instead of recycled. In Illinois, statewide data estimated that 42.4 percent of the solid waste stream is composed of materials that have established waste diversion programs. Established programs are categorized as being prominent and having easy accessibility to recycling sites. Some materials that have such programs are mixed paper, Uncoated OCC/Kraft (cardboard), yard waste, and more.[xiii] Landfilling recyclable materials unnecessarily contributes to the reduced life expectancy of the facilities and increases system infrastructure vulnerabilities. Diverting these materials can increase the life expectancy of landfills, reducing the need to site for additional facilities.

Accessibility

Across Illinois, areas with lower populations often have less access to waste diversion infrastructure compared to higher populated areas. This can be observed in Boone and Winnebago Counties as well. The lower populated areas, especially in Boone County, lack accessibility to recycling and material recovery drop-off facilities.[xiv] This lack of accessibility can result in less waste diversion and increased landfill disposal rates.

Data Reporting

Privatized waste facilities each have different policies and procedures, limiting access to data and posing a potential vulnerability in system knowledge. It is difficult to directly compare the different features of the solid waste management system, as many of them are privately contracted and may not share information with each other.[xv] While landfills and other waste and recycling facilities adhere to the regulations set forth by the state and federal government, they do not have a standardized method of data collection to make regional data analysis more cohesive. Further efforts to expand and standardize solid waste management data collection and transparency should be explored on a coordinated, regional scale.

Chapter 4: Waste Generation Assessment

Introduction

The Waste Generation Assessment chapter discusses overall waste generation and diversion rates, local waste stream impacts, and wastewater treatment within both Boone and Winnebago Counties. Waste generation refers to the amount of waste that has been produced by people or entities within a specific area. Waste generation metrics are shown by weight (tons), per capita, and by material type.[i] Waste diversion refers to the diversion of waste typically disposed of through traditional means such as landfilling. Waste diversion strategies include source reduction, recycling, reuse, or composting. Waste generation is important to monitor, as it speaks to the capacity of waste management assets with physical capacity limits, such as landfills. Waste diversion rates speak to how effective existing diversion programs are over time. There are various ways waste has been defined over time, and communities also define waste differently. This affects what data is collected and analyzed. Data collection and analysis has been constructed to accommodate these differences to the best ability possible. Each region defines Municipal Solid Waste differently. In this context, construction and demolition waste, and sludge are excluded from total MSW. This affects waste data when examined by weight.

Base Data for Projections

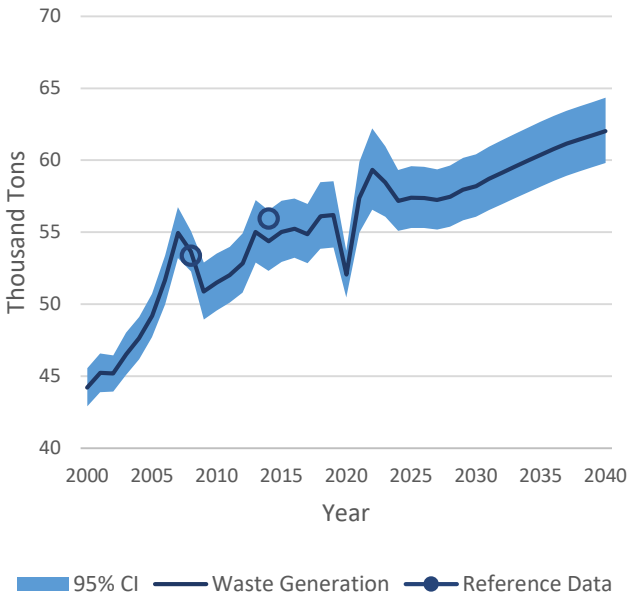
Waste generation estimates and diversion models were constructed by project consultant UIC and were based on 2019 five-year U.S. Census data, Regional Economic Models Inc. (REMI) employment, and population data projections within Boone and Winnebago Counties.[ii] Practitioner verification also supported data validation efforts. More information on UIC's methodology can be found in Appendix E. This data was vital to inform goals, recommendations, and implementation steps for the Plan.

Waste Generation in Boone County

Waste generation rates in Boone County have increased overall from 1990 to 2020. Waste generation rates decreased during the Great Recession of 2007-2009, but rose again after 2010. During the Great Recession, many Americans had less disposable income and manufacturers were also reducing production.[iii] Research compiled from the U.S. EPA suggests that waste generation rates decreased partly due to less production and consumption of goods. Given the amount of current facilities and practices, waste generation rates are expected to increase over time, as noted in Figure 4-1.

Boone County's fluctuations in waste generation rates for paper, metal, glass, plastic, and food are overall comparable to Winnebago County's rates, though waste generation rates in Boone County changed slightly more each 10-year period compared to Winnebago County. Those differences related to Boone County are largely a result of population and employment increases. Paper waste generation rates per capita decreased in a significantly shorter period compared to Winnebago County. The rural nature of Boone County suggests that fewer variables impact waste generation compared to Winnebago County, which could explain the rapid decrease of paper generation, and overall less stable generation rates. Plastic and metal waste generation rates per capita are comparable between the two counties, but waste generation rates per capita for organics in Boone County fluctuated more between 2005 and 2010 in comparison to Winnebago County.

Figure 4-1. Boone County Waste Generation Volumes

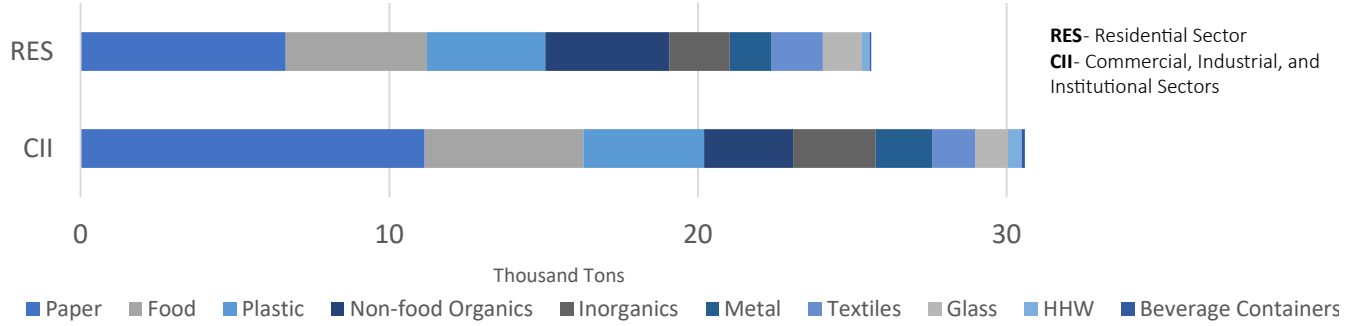


Source: Ning Ai, PhD- UIC 2021

Local Waste Stream Impacts

The majority of waste generated in Boone County is from Commercial, Industrial, and Institutional (CII) sectors. Though not a part of MSW, waste from agricultural farming practices and leading employers (such as area manufacturers and the local public-school district) impact waste streams in Boone County. Since 83 percent of land is used for agricultural production within the County, this may contribute to the slightly larger share of non-food organics in comparison to Winnebago County's waste stream (which has more yard waste).[iv] Other waste stream impacts associated with agricultural land use and farming are animal waste and crop residues.[v]

Figure 4-2. Boone County Waste Generation Volumes by Material (2019)



Source: Ning Ai, PhD- UIC 2021

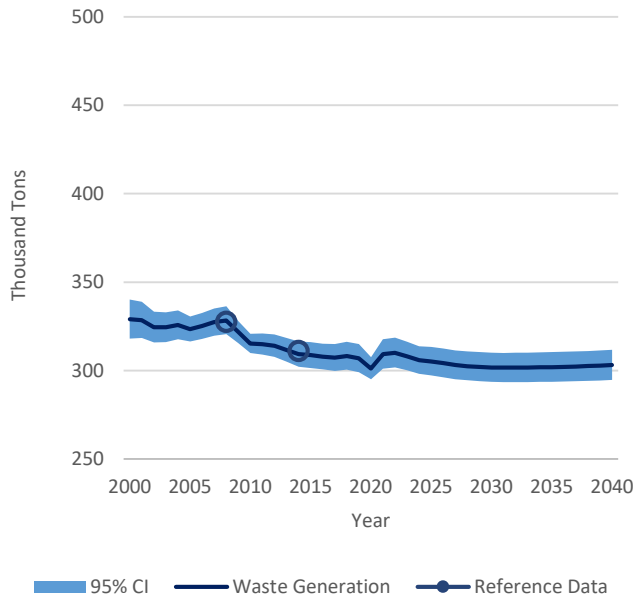
Large area employers in the manufacturing sector also influence waste composition. Employers are directly affected by economic shifts like the global microchip supply shortage.[vi] As a result, some employers had to reduce or shut down operations, which changed the overall composition and volume associated with CII waste streams.

Waste Generation in Winnebago County

Overall, per capita waste generation in Winnebago County has declined since the 1990s with minimal fluctuations.[vii] The highest waste generation volumes occurred between 2005 and 2010. The volume of waste has steadily declined from 2010 to 2020, but is projected to stabilize for the next 20 years with current management practices and infrastructure. UIC's projected data by material type show that paper, metal, and glass waste generation rates are declining. However, food and plastic waste quantities are increasing. The rise of personal computers and other technology has contributed to the significant decrease in paper's waste generation rate since the 2000s.[viii]

Plastic waste generation has increased over time because the material is a cheaper, versatile alternative to traditional material choices such as glass or wood. Cost and flexibility make the material an attractive choice for manufacturers, thus increasing the amount of plastic used in material production.[ix]

Figure 4-3. Winnebago County Waste Generation Volumes



Source: Ning Ai, PhD- UIC 2021

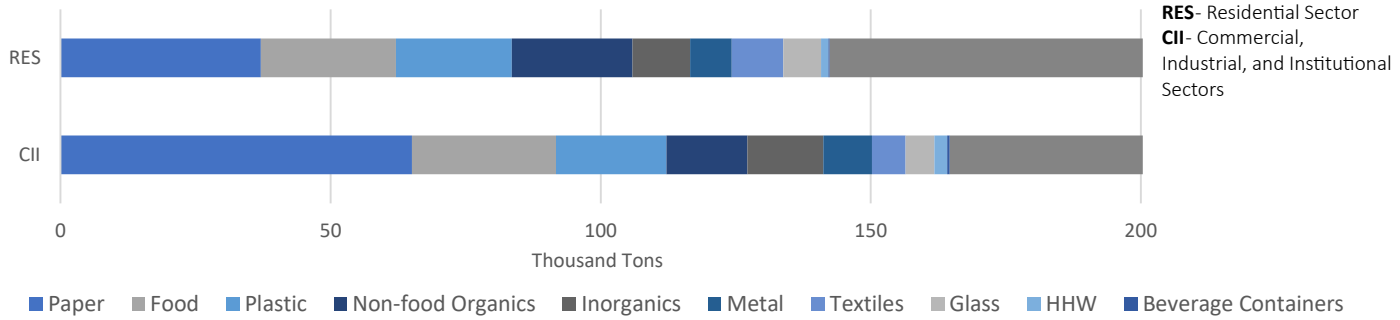
Local Waste Stream Impacts

Local employers, global supply-chain shortages, and the COVID-19 pandemic are just a few elements that impact the composition of Winnebago County's local waste streams. The County has significant industrial roots, which are still evident today. The area has a mix of industrial employers, while also indicating trends of de-industrialization. De-industrialization can result from market changes, technological developments, and economic shocks, affecting which industries operate within the County and subsequently the composition of local waste streams. The largest employment sectors are education, healthcare, and the automotive industries. Food waste from large educational institutions significantly contribute to local waste streams, as these places accommodate thousands of students and employees. Additionally, the healthcare industry affects the composition of waste, as medical waste has higher regulatory disposal requirements and surges are subject to health emergencies. Similar to Boone County, local manufacturing plants also affect the waste stream when economic shifts occur.

Overall Diversion Rate Estimates

The 2019 baseline model estimates an overall waste diversion rate of 18.2 percent across both counties. Currently, household hazardous waste (HHW) is the most diverted material type for the CII sector, as entities must adhere to legislative and workplace safety standards. Inorganic materials and paper respectively rank second and third for diversion rates. Non-food organics (such as yard waste, dirt, or leaves) were the most commonly diverted materials for households, followed by HHW and inorganics (such as E-waste or tires). These findings are supported by existing collection programs that target materials within these categories, in addition to curbside recycling services.

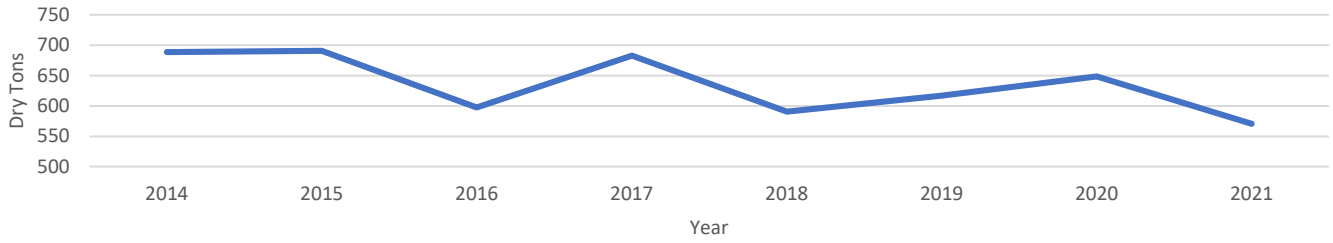
Figure 4-4. Winnebago County Waste Generation Volumes by Material (2019)



RES- Residential Sector
CII- Commercial, Industrial, and Institutional Sectors

Source: Ning Ai, PhD- UIC 2021

Figure 4-5. Belvidere Sewer Treatment Plant Annual Dry Tonnage 2014-2021



Source: City of Belvidere

Wastewater

Wastewater is an important waste stream to consider, as similar items can be found in comparison to the dry municipal waste stream such as food, paper, or flushable wipes. Moreover, it is important to account for this waste stream, as communities and the environment continually interact with wastewater, whether as inputs or outputs. The same factors (such as local employers, public health, or supply chains) can also influence the composition of local wastewater.

Wastewater, or used water, is routed from the built environment through utility pipes to be treated and released back into natural water systems. The used water is typically split into two categories: sanitary and stormwater. Due to water running over impervious surfaces, runoff from natural precipitation captures and carries a variety of pollutants. Stormwater is directed to street drains via elevation, routing the stormwater to be treated.[x] Sanitary wastewater is water used from common household sources (sinks, toilets, bathtubs, washing machines, dishwashers, etc.). This water is often treated for contaminants such as food particles, urine, and feces. Depending on the coverage area, wastewater treatment plants treat water from both categories, preventing many contaminants from re-entering local drinking water systems. Dry tonnage rates calculate the dry weight of sewage sludge (the residue generated during the treatment of domestic sewage), illustrating how much waste is handled throughout a given time period.[xi] A range of elements influence sludge production rates, including public health emergencies, weather, human habits, and cultural behavior. Significant, long term shifts in usage patterns affect which infrastructure is used and how often, consequently affecting maintenance and capacity. In addition to dry tonnage, water quality may provide insights concerning the effectiveness of an area's disposal process and waste diversion programs.

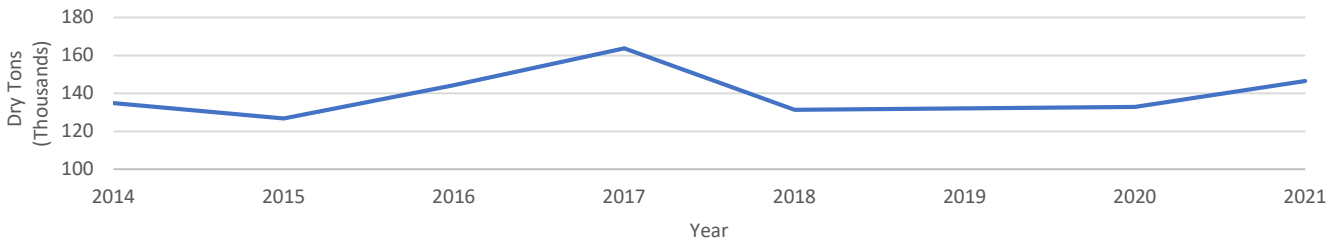
Boone County

The Belvidere Sewer Treatment Plant within Boone County routes treated water to the Kishwaukee River and Upper Rock River watersheds. The facility uses a secondary digester to heat up and break down waste separated from the water. The fertilizer produced from the separated waste is then donated to local farmers. Annual dry tonnage rates have remained somewhat consistent the past eight years, with an overall declining trend in volume with a fluctuation of approximately 120 dry tons. Approximately one third of the produced sludge is landfilled.

Winnebago County

The largest water treatment facility in Winnebago County, Four Rivers Sanitation Authority (FRSA) serves 240,000 community members across almost 100 square miles.[xii] Over 1.5 billion gallons of treated wastewater flows back into the Rock, Kishwaukee, Pecatonica, and Sugar Rivers each year.[xiii]

Figure 4-6. Four Rivers Sanitation Authority Annual Dry Tonnage 2014-2021



Source: Four Rivers Sanitation Authority

This facility captures the methane gas produced from the water purification process to fuel 70 percent of its daily processes. The solid waste byproduct from this same process is transformed into a biosolid fertilizer used by local farmers. Dry tonnage rates from 2014 to 2021 have increased slightly overall, with the most dramatic increase occurring from 2015 to 2017.

Economic, Environmental, & Social Impacts

This subsection explores the environmental, economic, and social impacts the regional solid waste management system has on the Rockford Region. Identification of possible and measured impacts is the first step towards mitigation, and in turn will support a system that provides equitable and sustainable waste management.

Economic Impacts

Regional solid waste management systems and infrastructure impact the local economy in many ways. Solid waste management systems can create a significant number of reliable, diverse employment opportunities. Landfills, recycling facilities, transfer stations, and waste collection are sources of employment for individuals of varying skill sets and education levels. Implementation of Waste-to-Energy (WTE) energy technologies at new or existing facilities also can create local jobs and increase revenue sources.

Proper waste management is essential for an area's economic and environmental resilience. While traditional disposal methods are initially cheaper, many are not sustainable. Once traditional methods are not viable due to limited capacity and environmental concerns, funds must be used to consider other methods. Financing options are context specific and its associated fees (collection fees, host fees, tipping fees, etc.) affect waste management feasibility. For example, the Winnebago Landfill charges tipping fees (paid by those who bring waste to the landfill) to support their business. The Winnebago Landfill charges a tipping fee of $60 per ton of waste for general refuse that is disposed of on-site. The tipping fee for cement disposal is dependent on the size of the vehicle between the range of $20 to $60 per vehicle.[xiv] While the landfill does make profit from tipping fees, there are also fees and taxes the landfill must pay. One example is the host fee, which the landfill pays to Winnebago County per ton of waste that is disposed of at the landfill. These fees are then deposited into a specific host fee fund maintained by the County, where a large proportion is put toward debt service regarding economic development projects in addition to subsidizing some local non-profit organizations.[xv] Some of the major economic developments supported by Host Fee funded grants include the construction of Nicholas Conservatory and Gardens, renovating the BMO Harris Centre, and Rock Valley College's Aviation Maintenance Technology Program.

However, compounding waste management issues can also lead to adverse economic outcomes. Environmental impacts due to improper waste management can require remediation, the efforts of which are often costly. In extreme cases, improper waste management can lead to negative public health outcomes, straining the local workforce and public services.

Areas with visibly poor solid waste management systems may hinder economic development, as the visual nuisance is off-putting to potential investors, developers, and community members.

The Need for a Circular Economy

Winnebago and Boone Counties currently resemble what is referred to as a linear economy. This is an economic system in which raw materials are used to make products that are subsequently disposed of in landfills.[xvii] This economic system is not sustainable nor economically feasible, especially in the context of projected waste generation rates and landfill capacity. One approach to solve unsustainable waste practices is the development of a circular economy. A circular economy places great value on recycling and reusing materials that have already been manufactured instead of relying solely on raw materials. Strategies for the adoption of a circular economy include reducing dependence on materials that cannot be recycled or reused and encouraging design of products that are reusable, long-lasting, and easy to repair.[xviii] The establishment of a circular economy has the potential to reduce disposal rates, thus increasing the life expectancy of landfills. However, the scalability of a circular economy is limited to area density and resources.[xix] For this reason, a larger, coordinated approach is needed to sustain this effort.

Figure 4-7. Linear Economy

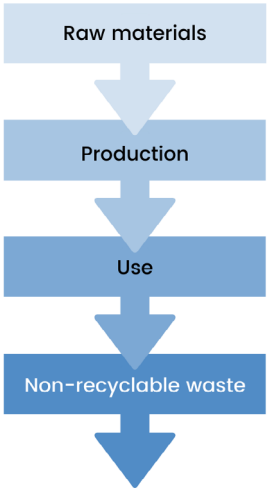
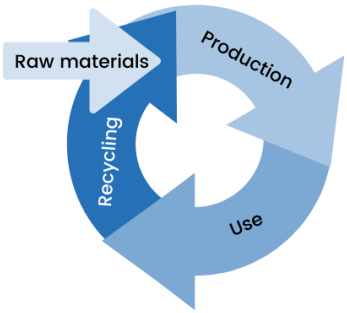


Figure 4-8. Circular Economy



Environmental Impacts

Having a safe and efficient solid waste management system is imperative for community health and a clean environment. However, even with an organized system, waste can still pose a threat to the environment, the economy, and the community. Identifying the environmental impacts of the solid waste management system can aid in mitigation efforts.

Air Quality

Emissions produced by landfills are of great environmental concern because the breakdown of waste releases landfill gases (LFG) into the atmosphere. The chemical makeup of LFG is estimated to be approximately 50 percent methane (CH_4), 50 percent carbon dioxide (CO_2), and a small percentage of other gases.[xx] These other gases can include volatile organic compounds (VOCs), which are known to cause health problems. VOCs are substances characterized by their ability to easily undergo a phase change to a gaseous state due to their high vapor pressure.[xxi] Once in a gaseous state, humans are susceptible to contaminant exposure through inhalation.

VOC exposure can cause irritation of the eyes, nose, and throat, and in extreme cases, even more severe health complications.[xxii] Common objects that contain VOCs are paint, adhesives, and dry-cleaning chemicals, therefore proper disposal of these products is important. Another gas emitted from landfill activities is hydrogen sulfide. This gas is known for its extremely strong and unpleasant odor that resembles the smell of rotten eggs. It has been known to cause irritation of eyes, nose, and throat, and nausea.[xxiii] Methane and carbon dioxide are categorized as greenhouse gases (GHGs), which are major contributing factors in climate change. Methane and carbon dioxide act as an insulator of solar radiation. While some insulation is necessary to keep the earth at a habitable temperature, anthropogenic activity has created an overabundance of GHGs in the atmosphere.[xxiv] Methane in particular is of great concern due to its effectiveness as a GHG. Compared to carbon dioxide, methane is 28 to 36 times more effective at trapping in atmospheric heat over a 100-year period.[xxv] Municipal landfills are the third greatest anthropogenic contributors to methane in the atmosphere.[xxvi] In addition to emissions from landfills, air quality is also impacted by the waste transportation network. The large vehicles used routinely to transport waste and recyclables are mobile sources of air pollution.

Hazardous Waste

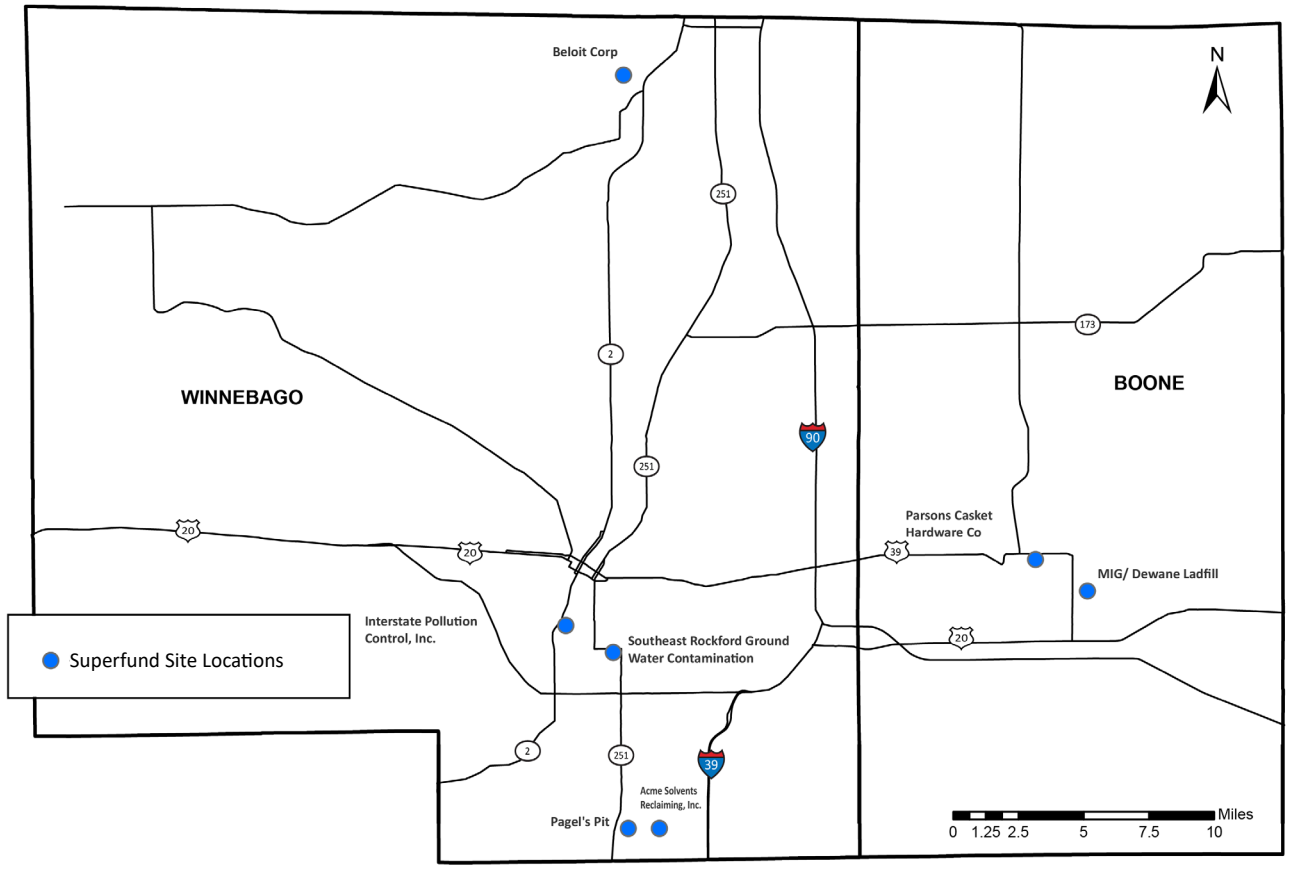
Hazardous waste must be disposed of in the appropriate manner for the safety of the sanitation workers, the community, and the environment. This is applicable for commercial, manufacturing, and even municipal waste. A substance is considered hazardous waste when it is no longer being used and poses a risk to human health and the environment.

Hazardous waste can be categorized as corrosive, toxic, reactive, or flammable.[xxvii] Proper handling and disposal of hazardous waste is of great importance. Even everyday household items can pose a risk. HHW includes substances such as paint, batteries, motor oil, and cleaning chemicals. Such substances should be disposed of at designated HHW drop off centers. Even so, disposal of HHW may be difficult to monitor and enforce, and individuals may be unaware of the proper way to get rid of household waste. As a result, this waste may end up in municipal trash, washed down the drain, or left outside.[xxviii] This can be dangerous in the short term for sanitation workers, plants, and animals that may be exposed, and long term for the local community and environment. It also has the potential to damage multiple aspects of the solid waste management system, such as waste water treatment plants and septic systems.

Superfund Sites

Landfills and other waste sites impact the environment long after operations close. Routine monitoring is conducted at inactive landfill sites for at least 30 years after closing, as they still pose a risk to air and water quality. The Comprehensive Environmental Response Liability and Compensation Act (CERCLA) established regulatory guidelines for abandoned hazardous waste sites, referred to as Superfund sites.[xxix] These sites are located all across the country, including in the Rockford Region. Boone County has three Superfund sites, and Winnebago County has six.[xxx] It is important to continue the monitoring and remediation of these sites for environmental and public health purposes. Additionally, consistent monitoring and record keeping ensure these areas can have a second life as a community asset when safe to do so.

Figure 4-9. Superfund Sites in Boone & Winnebago Counties



Source: EPA Superfund Database

An example of illegal dumping (used tire).

Illegal Dumping

Illegal dumping occurs when waste is disposed of inappropriately without regard to policy or law. This issue can take many forms, and the unauthorized disposal of waste can pose a threat to the environment and the community. Some illegally dumped waste might have hazardous properties such as high flammability or corrosivity, and people or wildlife may be harmed if they accidentally came into contact with it. Other items such as large furniture, appliances, and tires may be an eyesore when dumped illegally, and in severe cases can also result in a drop in local property value.[xxxi]

Per- and Polyfluoroalkyl Substances (PFAS)

Per- and polyfluoroalkyl substances (PFAS), referred to as "forever chemicals," are a group of man-made chemicals, some of which have been determined to cause adverse health effects. These substances have been utilized in commercial, industrial, and home settings. The production and disposal of PFAS is regulated by the government, however they are still under-regulated in regards to the contamination that is already present in the environment. The detrimental nature of PFAS has been known for decades, yet as of 2021, they are still not listed as federal drinking water contaminants. Fortunately, the EPA has shifted its focus towards regulation and remediation of PFAS with their recently developed "PFAS Strategic Roadmap." Implementation will result in increased polluter responsibility, additional scientific research, and the inclusion of drinking water regulations for perfluorooctanoic acid (PFOA) and perfluorooctane sulfonate (PFOS).[xxxii]

PFOA and PFOS are especially hazardous PFAS and are no longer produced in the United States. PFOA and PFOS are man-made industrial compounds; their ability to repel water was utilized for water and stain proofing of multiple materials, nonstick cookware, and fireproofing.

Although these two substances are no longer manufactured in the United States, products containing PFOAs and PFOS can still be imported into the U.S. from other countries in addition to impacting the environment through their persistence.[xxxiii]

PFAS may be present in many common products, including household cleaning, personal care, and food preparation products. The disposal of such products into landfills can contribute to groundwater contamination through mixing with untreated landfill leachate. Due to its tendency to persist not only in water and soils but also in living organisms, PFAS remains a grave concern for waste management systems. Consumption of an animal or plant that has been exposed to PFAS is another route of exposure for humans, and these substances bioaccumulate all of the aforementioned.[xxxiv]

Water Quality

A chief environmental concern in solid waste management is the health of nearby water sources. Both groundwater and surface water are at higher risk of being contaminated by nearby solid waste sites. A combination of waste breakdown and environmental conditions can produce a liquid called landfill leachate. This leachate contains the same contaminants present at the waste site, and it can also leach into nearby groundwater if not handled properly. As groundwater travels downstream, the contaminants do as well.[xxxv] This can threaten the quality of groundwater for both humans and wildlife. Groundwater irrigates crops in rural areas and is also the source of drinking water for Boone and Winnebago Counties.[xxxvi] Groundwater contaminants of concern that originate from landfills include a range of dangerous substances such as heavy metals, bacteria, and PFAS.[xxxvii]

Social Impacts

The solid waste management systems in Boone and Winnebago Counties provide important services to local communities, but these communities can also be impacted by their operation.

Human Health

Living in close proximity to a landfill can have adverse impacts on the health and overall wellbeing of a community. Reported health problems associated with landfills are dependent on a variety of factors. Some landfills appear to cause more health problems than others, and even then it may be challenging to identify the landfill as the main cause. Many individuals who live near landfills have self-reported symptoms such as headaches, nausea, fatigue, breathing and stomach problems, and changes in mental state.[xxxviii] Some reported health impacts of landfills and hazardous waste sites are more severe. Low birthrate or birth defects in infants, cancer, and liver problems have been observed in areas with operating landfills.[xxxix] Based on research performed, these occurrences appear to be rare, and it is challenging to prove that a waste site is responsible for these health impacts. The studies may not have taken other variables into account, such as the socio-economic status and healthcare access of those afflicted, showing that more research is needed to better determine the health impacts and outcomes.[xl]

Equity & Environmental Justice

In addition to lacking access to purchasing sustainable food options, the same groups may be disproportionately affected by the location of solid waste management infrastructure. Individuals and families who are in one or more socially vulnerable groups (low-income, lack of education, marginalized minority groups) are more likely to live near a landfill than less vulnerable populations.[xli] This presents potential issues of equity and environmental justice, as these populations are often the most impacted by the placement of waste management facilities. Landfills can also impact the value of nearby homes. Small landfills can cause the value of nearby houses to drop by approximately 2.5 percent, while larger landfills can drop home value by approximately 12.9 percent on average.[xlii] Those living near landfills may also experience a lower quality of life from related nuisances, such as sight or odor and possible health concerns. Locally, residents also claim that the transport of waste to this site has caused an issue with litter, as some waste occasionally falls from collection trucks and into the surrounding community.[xliii] Additionally, there may be increased traffic and noise attributed to waste hauling, causing further adverse impacts.

On Landfill Gas Emissions

Landfill gas emissions can affect local air quality by compromising respiratory health and aesthetics.

Source: Vrijheid, Martine

Other environmental justice issues related to solid waste management is the affordability of waste disposal, curbside service and drop off center access. Within the City of Rockford, the monthly fee for municipal waste pickup and disposal in 2021 is $22.06.[xlv]

While this amount does not seem excessively high, it could put stress on households that already have significant financial struggles. Lack of access to affordable and local nontraditional waste disposal can exacerbate the region's ongoing illegal dumping problem. Commonly dumped items such as bulky items, electronics, and appliances have fees associated with disposal. Those who are unable or unwilling to pay these fees may keep materials with additional disposal costs, or dispose of them improperly.

Local Concerns

The Village of New Milford residents, who are in close proximity to the Winnebago Landfill, have raised concerns regarding the unpleasant odors and loose debris from waste hauling vehicles. In 2010, the site received violations from the EPA for failure to properly maintain the generated landfill gases, including hydrogen sulfide, causing unpleasant odors in nearby areas.[xlv] However, the odor issues still persisted, so in December 2020 a lawsuit was filed by the State of Illinois against Winnebago Landfill Company and Winnebago Reclamation Services Inc.[xlvi]

Some of these concerns were collected from a public survey taken by residents of Boone and Winnebago Counties regarding the regional solid waste management system. This survey allowed residents to state their concerns and impacts of the current solid waste management system. A frequently referenced concern was the air quality near the landfill. Many survey respondents expressed concern about their health as a result of the odors, and one respondent was concerned about groundwater quality.

Chapter 5: Proposed Material Management Plans

Introduction

Methodology

Methodology for waste diversion modeling is available in Chapter 4: Waste Generation Assessment. The Plan prioritizes materials categories with the largest diversion potential between the 2019 (baseline) and 2027 scenarios. Specific materials within the categories were chosen based on previous and projected generation volumes, diversion method options, and environmental impacts.

Traditional Materials

These are materials that are collected from generators by waste and recycling haulers typically as part of a regularly-scheduled service. These materials include:

- Residential curbside single-stream recycling, organic waste, and solid waste; and
- Commercial recycling, organic waste, and solid waste.

Source: Illinois Materials Management Advisory Committee, 2021

Traditional Material Diversion Efforts

Current Items Recycled

Currently, metal, paper, glass, plastic, and milk/juice cartons may be diverted through unlimited single stream recycling in the following jurisdictions: Belvidere, Caledonia, Poplar Grove, Rockford, Durand, Pecatonica, Cherry Valley, Lake Summerset, Loves Park, Rockton, Roscoe, South Beloit, and the Village of Winnebago.[i] Advanced Disposal, Rock River Disposal, and Gill's Freeport Disposal are the three main haulers that serve the area, (all managed under Waste Management) but additional haulers available include Republic Services, Green for Life, and Veolia. Specific materials accepted by the three main haulers in the Northern Illinois region are:

- Aluminum/tin containers
- Paper and paperboard
- Glass containers
- Plastics #1-5, #7
- Milk and juice cartons

Advanced Disposal offers residential, commercial, and government recycling services. Some of their facilities, including the Rockford location, offer special waste recycling such as industrial foundry sands. Rock River Disposal and Gill's Freeport Disposal offer commercial and residential recycling to customers in the area.

Table 5-1. Bi-County Materials Targeted for Diversion Matrix

Material Group	Current Diversion Rate (2019)		Short Term Goal (2024-2026)		Long Term Goal (2050)	
	Residential Sector	CII Sector	Residential Sector	CII Sector	Residential Sector	CII Sector
Fiber						
Paper	32.20%	39.80%	48.50%	71.10%	90.00%	90.00%
Organics						
Non-food Organics	75.00%	21.60%	75.00%	45.00%	90.00%	90.00%
Food	1.10%	1.10%	50.00%	50.00%	90.00%	90.00%
Plastic	7.00%	6.80%	11.40%	10.30%	90.00%	90.00%
Metal	39.70%	38.30%	57.90%	54.60%	90.00%	90.00%
Glass	22.70%	20.30%	31.30%	27.30%	90.00%	90.00%
Inorganics	42.40%	52.90%	50.30%	65.90%	95.00%	95.00%
Other Inorganics						
HHW	53.10%	53.10%	62.40%	62.40%	95.00%	95.00%
Textiles	16.10%	16.30%	19.10%	19.40%	95.00%	95.00%
Beverage Containers	5.50%	5.50%	6.50%	6.50%	90.00%	90.00%
Participation Rate	85.00%	45.00%	90.00%	70.00%	100.00%	100.00%
Overall Diversion Rates	**18.20%**		**38.60%**		**90.70%**	

Source: Ning Ai, PhD- UIC 2021

Hauler availability by jurisdiction is also available in Table 2-2. Some of the smaller municipalities within Boone and Winnebago Counties such as Capron, Timberlane, and New Milford do not have waste collection information available online.

Traditional Recycling Efforts

All haulers for Boone and Winnebago County municipalities provide residents with recycling containers. Additional bins are available for an added cost. Rock River Disposal works with Keep Northern Illinois Beautiful to divert a range of traditional materials (excluding cartons) and select non-traditional materials at two collection centers.

KNIB Recycling Centers

- Rockford Recycle Center: 4665 Hydraulic Road, Rockford, IL 61109: Tuesday 2-5P; Saturday 9A-12P
- Machesney Park Recycle Center: 8409 N. 2nd St. Machesney Park, IL 61115: Wednesday 2-5P; Saturday 9A-12P

Source: Keep Northern Illinois Beautiful

Additional Items to be Diverted

Though all local waste haulers offer recycling services for traditional materials, there is potential within Boone and Winnebago Counties to increase collection and diversion rates. In the commercial, industrial, and institutional (CII) sector, paper, metal, and glass materials have the largest gaps between diversion potential and current estimated rates. Metal is the least diverted material in the residential sector, followed by paper and glass. Waste education and outreach, policy changes, and community partnerships can collectively increase diversion efforts.

Recommendations

The following recommendations support increased diversion rates for paper, metal, and glass in order to achieve a traditional materials diversion rate of 85 percent by 2042. Incremental goals at five and 10 years are also established for evaluative purposes.

Rec. 1. Promote recycling amongst commercial, institutional, and industrial sectors.

Rec. 2. Promote education on waste minimization and proper recycling through public campaigns

Rec. 3. Consider ordinances to increase commercial, industrial, and multifamily recycling.

Non-Traditional Material Diversion Efforts

Non-Traditional Materials

Non-Traditional Materials include materials managed through programs provided by local governments or by private sector collectors. These materials include batteries, bikes, books, construction & demolition (C&D) recycling and solid waste, confidential documents, electronics, fluorescent tubes and bulbs, household hazardous wastes (HHW), paint, polystyrene, scrap metal, scrap wood, shoes, textiles, tires, tools, and other hard-to-recycle materials.

Source: Materials Management Advisory Committee

Current Items Recycled

Non-traditional recycling materials include but are not limited to electronics, hazardous waste, and construction and demolition debris. HHW addresses many of the non-traditional recycling materials and therefore is the main focus of this subsection. There are several options for the collection of HHW in the region, such as Boone County's Administrative Campus, Rockford Disposal Center Hazardous Waste Site, Rock River Valley Compost, Paper Recovery Service Corp., Cimco Resources Inc., KNIB Rockford and Machesney Park Recycle Centers, and private haulers such as Rock River Disposal and Advanced Disposal. Some local big box stores also have programs that accept electronic waste such as Best Buy, Costco, Target, Staples, and Walmart.

Boone County has a HHW collection location at their administrative campus in Belvidere, and Winnebago County collects HHW at the City of Rockford's Household Hazardous Waste Disposal Center. These locations accept the following items listed below:

HHW Locations and items accepted

Boone County Administrative Campus

- Oil-Based Paints
- Household Batteries
- Used Motor Oil
- Paint Thinners
- Herbicides
- Lawn Chemicals
- Insecticides
- Solvents
- Pesticides
- Antifreeze
- Old Gasoline
- Hobby Chemicals
- Pool Chemicals
- Aerosol Paints and Pesticides
- Cleaning Products
- Fluorescent Lamp Bulbs
- Mercury
- Drain Cleaners
- Acids
- Corrosives
- Unwanted Medications (excludes Controlled Substances)

Rockford: Household Hazardous Waste

- Adhesives
- Aerosol Cans
- Antifreeze
- Arts & Crafts Paints
- Asbestos (caulk/roofing tar/paint)
- Asbestos tiles or shingles
- Auto Body Filler
- Auto parts
- Automotive fluids & fuels
- Batteries (Nickel-Cadmium, Lithium-Ion, Lead-acid)
- Body putty
- Brake Fluid
- Car & chrome polish
- Car cleaners
- Carburetor cleaner
- Caulks
- CFL (compact fluorescent light) bulbs & tubes
- Charcoal
- Cleaners/Cleaning products, solvents, wipes
- Coolant
- Concrete sealant
- Craft & hobby chemicals
- Diesel fuel
- Dish soap
- Drain cleaners
- Driveway sealant
- Engine Degreaser
- Epoxies
- Fertilizers
- Flammable liquids – in properly marked containers
- Florescent Tubes/Bulbs
- Freon in aerosol cans (R-11, R-34a)
- Fuel and oil additives
- Fuel injector cleaner
- Fungicides
- Garden chemicals
- Gasoline
- Glues
- Grease and rust solvents
- Herbicides lawn chemicals
- Household batteries (nickel-cadmium, nickel-metal hydride, lithium-ion, lead-acid)
- Household cleaners
- Insecticides
- Kerosene
- Lacquers and stains
- Lamp oil
- Laundry detergent
- Lawn and garden products
- Light bulbs
- Mercury – thermometers, thermostats
- Mercury – metallic liquid, solids
- Mineral Spirits
- Naval jelly
- Ni-Cad Batteries (Nickle-Cadmium, rechargable)
- Oil, automotive
- Oil, based paints (alkyd)
- Paint- oil-based only (no Latex paint)
- Paint Strippers/Paint Thinner
- Peanut Oil
- Pesticides (residential size)
- Photo Processing Chemicals
- Pool Chemicals/Additives/Chlorine
- Radiator fluids
- Rechargeable batteries
- Resins, fiberglass & epoxy
- Roach and Ant killer
- Rodent Poisons
- Roofing tar
- Rubber cement & thinner
- Shampoo
- Skin lotions
- Soil fumigants
- Starter fluids
- Thermometers (mercury)
- Thermostats (mercury)

Keep Northern Illinois Beautiful

- Appliances with refrigerant
- Auto or Marine Batteries

Rock River Disposal

- Asbestos
- Non-toxic fry ash
- Non-toxic foundry sand

Advanced Disposal

- Paints
- Motor oil
- Fertilizers
- Fluorescent light bulbs
- Aerosol cans
- Batteries
- Cleansers
- Insecticides

Additional Items to be Diverted

It is important for households and businesses to be able to safely dispose of waste generated. There is a need for better waste collection of hard-to-recycle materials such as fire safety materials, automotive materials, and commercial debris. In the September 2021 public meeting and Solid Waste Management Survey, community members expressed that televisions, paint, and general electronics were among the most difficult items to divert from the landfill. Additional items identified to increase diversion rates are E-waste (such as televisions, mobile phones, and computers), polystyrene foam, tires, and paint. These items should be the main focus in diversion efforts due to the current lack of waste management infrastructure, environmental impacts, economic value, and system gaps.

Recommendations

Non-traditional material diversion recommendations range from policy changes, public collection events, and programming to achieve high level diversion goals.

Rec. 1. Sponsor one day events and or drop off locations for non-traditional materials.

Rec. 2. Monitor legislative actions for opportunities targeting special recycling efforts.

Rec. 3. Promote the reduction and proper disposal of non-traditional materials.

Rec. 4. Prioritize and explore methods of diverting frequently landfilled or hard-to-recycle items.

Organics Material Diversion Efforts

Organic Materials

Organic material is any material that is biodegradable (can be broken down into carbon dioxide, water, methane, or simple organic molecules by microorganisms and other living things) and comes from either a plant or animal.

Source: Illinois Materials Management Advisory Committee

Current Items Recycled

Currently, residential organic waste disposal is limited to yard waste collection through Rock River Valley Compost, Garden Prairie Organics, and several municipalities. There are no opportunities for residents to drop off food waste within Boone and Winnebago Counties.

Additional Items to be Diverted

There are many additional organic materials that can be diverted from the landfill. Food scraps and yard waste make up roughly 30 percent of the waste stream, and the most common way to divert organic waste from landfills is by composting.[ii] Creating a curbside organic waste collection for compost could decrease the amount of food waste and other organic materials that end up in the landfill. Compost is a nutrient rich soil that can be used for gardening or agriculture.

Recommendations

Organics material recommendations largely center around increased diversion rates for food waste, as infrastructure for non-food organics (yard waste collection) is relatively established. Though diversion efforts are important, some strategies involve source reduction efforts, such as reducing initial food excess and providing cost savings for businesses, consumers, and waste industry leaders through infrastructure.

Rec. 1. Promote greenscaping and home management of yard waste.

Rec. 2. Coordinate with neighboring jurisdictions for seasonal composting events.

Rec. 3. Evaluate the feasibility of a local food scrap collection and compost program.

Rec. 4. Evaluate the feasibility of voluntary or mandated food scrap composting programs.

Rec. 5. Develop opportunities for pre- and post- consumer food recovery.

Materials to Target for Diversion (2027)

Existing waste management infrastructure shows limited options to divert plastics, organics and metals within collection infrastructure, yet these materials make up a large portion of local waste streams. While some drop off locations are available, transportation, fees (i.e. televisions/monitors) and limited hours are barriers to participation.

Targeting these materials can amplify local diversion efforts while exploring the larger waste composition from origins outside the two counties. Further analysis must be conducted to account for additional factors such as outside waste entering the community, metrics to assess material amounts by mass (as weight is the current metric), the cost effectiveness and net benefit of specific material diversion in addition to current market conditions.

Table 5-1 displays current diversion rates by material in addition to five, 10-, and 15-year goals. These were formed from UIC's data projections based on population, employment, and historic area data. Refer to Chapter 4 for a more detailed explanation on how diversion potential estimates were calculated and conceptualized. Plastics, food waste, and textiles are specifically targeted categories due to the disparity between the waste stream and diversion rates (refer to table 5-2 for current collection opportunities). These determinations are also supported by lack of generator participation and or programming gaps.

Table 5-2. Collection Opportunities for Targeted Materials

Material	Opportunity
Plastic Bags	Meijer, Wal-Mart, Lowes, Target, Schnucks
Beverage Containers	Private haulers, KNIB
Paper	Private haulers, KNIB, Cimco Inc., Boone County Highway Dept.,
TVs, Monitors, E-Waste	Boone County Highway Dept., KNIB
Cleaning Supplies	Boone County Administrative Campus
Medication	KNIB medication drives, Boone County Administrative Campus
Food Scraps	None
Clothing, Household goods	KNIB, Good Will, Mercy House, Salvation Army

Traditional Materials

Recycling efforts for traditional materials are available through publicly-coordinated curbside recycling for 14 of the 17 municipalities in Boone and Winnebago Counties. Two drop-off centers are available for residents who do not have curbside recycling: Keep Northern Illinois Beautiful (KNIB) Rockford and Machesney Park Recycle Centers.

Non-Traditional Materials

Disposal options for non-traditional items include:

- Boone County Administrative Campus
- Rockford Disposal Center
- Hazardous Waste Site
- Rock River Valley Compost
- Paper Recovery Service Corp.
- Cimco Resources Inc.
- KNIB Rockford and Machesney Park Recycle Centers
- Private haulers such as Rock River Disposal and Advanced Disposal

Organics

Rock River Valley Compost, Garden Prairie Organics, and haulers through several municipalities accept yard waste. There are currently no locations in Boone and Winnebago Counties to drop off food waste.

Plastics

Plastics have many applications and can be found in a variety of common consumer products (both single-use and reusable). Plastic subsequently accounts for a significant portion of waste streams for both sectors and counties (refer to Table 5-1). However, only seven percent of residential plastic and 6.8 percent of CII plastic is diverted from landfills. Local Northern Illinois haulers already accept a majority of these products for recycling, so other barriers and perspectives must be addressed. Plastic products targeted for diversion fall within recycling categories #1-5 and #7. Figure 5-1 shows examples of material within each category.

Food Waste

Organic waste is the second largest category within each County's waste stream projection, yet there are only yard waste collection programs to account for a portion of this share. This gap indicates an opportunity to divert a large volume of material across many areas.

Additionally, organic waste (including most food and byproducts) is compostable and combustible, which means there is also potential for energy generation.

Food Waste

Food waste is defined as:

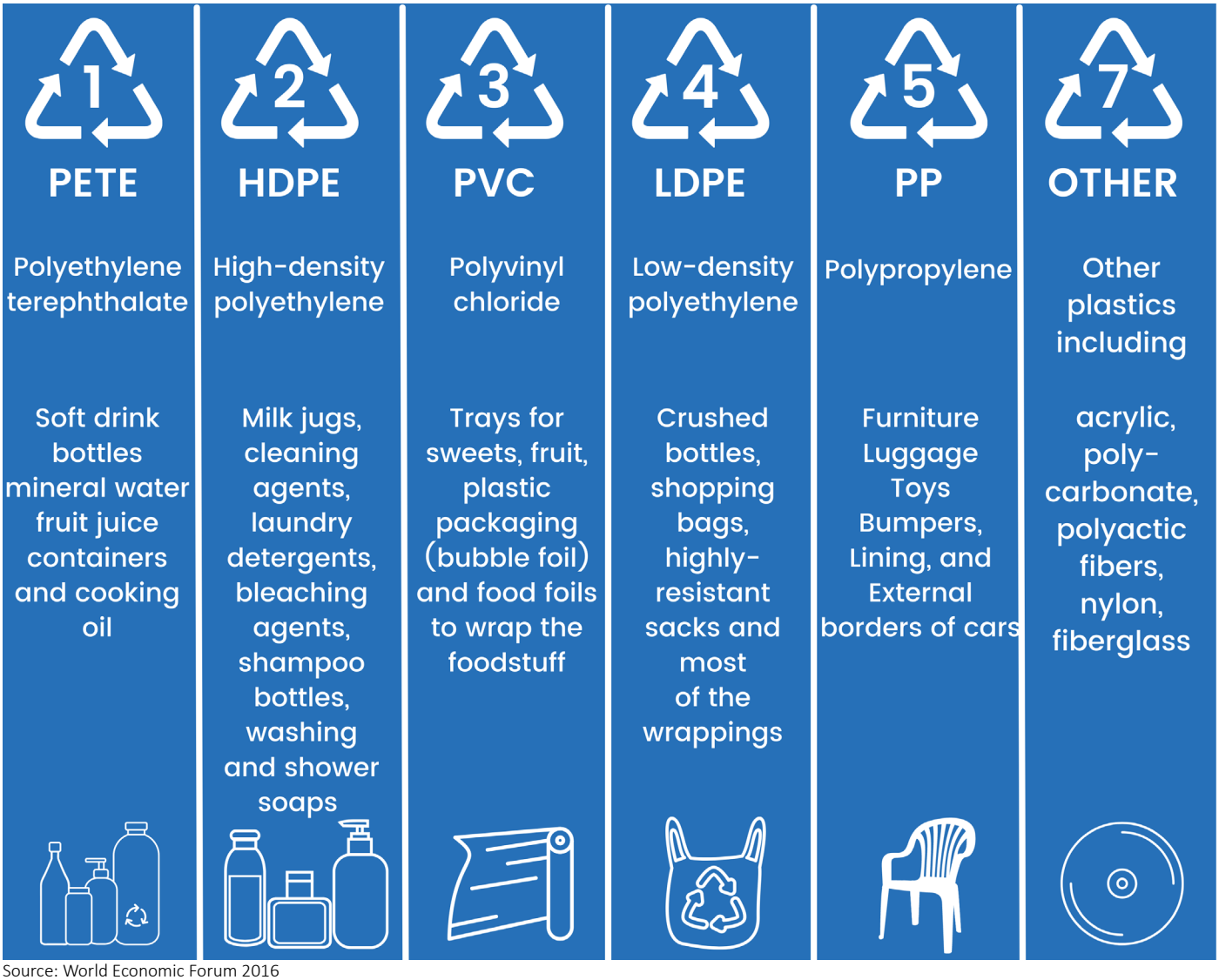
- Leftover Food
- Spoiled Food
- Food Scraps (e.g. peels, rinds, eggshells, nut shells)

Source: EPA (Sustainable Management of Food Basics)

Textiles

Textiles such as used clothing, footwear, sheets, towels, curtains, or carpet can be made from synthetic or natural fibers and have a variety of uses. Synthetic materials such as polyester contain microplastics, which break down during the decomposition process and affect the surrounding environment.[iii] This material category had one of the lowest diversion rates in 2019, yet about 95 percent of reusable household textile products can be reused or recycled.[iv] Additionally, many landfill diversion/reuse opportunities exist for textiles within Northern Illinois, therefore strengthening these existing resources can offer a larger impact at a lower cost (as opposed to creating new infrastructure or programming).

Figure 5-1. Material Types and Examples



Source: World Economic Forum 2016

High Level Diversion Goals

After a detailed analysis, plastics, textiles, and food waste have been identified as targeted materials. Prioritizing material-specific recommendations for the next reporting cycle is essential to achieve the following high-level diversion milestones. These recommendations were formed with local context in mind and also by observing potential opportunities and suggestions from Illinois' Materials Management Advisory Committee (MMAC).

Goal 1. Achieve a 95% non-traditional materials diversion rate by 2042

Goal 2. Achieve an overall 85% Traditional Materials diversion rate by 2042

Goal 3. Achieve an 85% organics diversion rate by 2042

Figure 5-2. Specific Items to Target for Diversion

Disposal Efforts

Facilities for Disposal

Solid waste in Boone and Winnebago Counties that is not diverted ends up in one of the seven landfills in Region 1 in addition to neighboring landfills.

The region's proximity to two densely populated locations make solid waste infrastructure all the more critical, as more than just Northern Illinois residents depend on it for disposal. Though impact data for waste origins is not available, the IEPA's 2021 Landfill Disposal Capacity Report shows that the region's average landfill life expectancy is the second lowest, despite having the most remaining capacity by far.

Chapter 6: Public Education & Outreach

National Efforts

At a national level, many federal programs and opportunities for public solid waste education are primarily for school boards, educators, and higher education students and graduates. The end result tends to be a wide selection of strategies and findings that can generally be utilized equally among institutions.

U.S. Environmental Protection Agency

The 1990 National Environmental Education Act requires the U.S. Environmental Protection Agency (EPA) to provide national leadership to increase environmental literacy. This act establishes the Office of Environmental Education, an Environmental Education and Training Program, Environmental Education Grants, and Environmental Internships and Fellowships.

Office of Environmental Education

The EPA website defines environmental education as a process that allows individuals to explore environmental issues, engage in problem solving, and act to improve the environment.[i] Rather than advocating a particular course of action, environmental education shows individuals how to weigh perspectives on environmental issues through critical thinking. The Office has an environmental education coordinator and initiatives for each of the 10 EPA regions. Each regional office develops and supports environmental education efforts for their region, with coordinators who award grants, train environmental professionals to develop and deliver environmental education programs, as well as work in partnership with nonprofit organizations and educational institutions.[ii]

Environmental Education & Training Program

Through the National Environmental Education and Training Program (NEETP), the EPA supports environmental education and training for teachers and other educational professionals. Each iteration of NEETP varies in specific activities and methodologies, but includes mandated functions and activities as part of their overall program. Some of those mandated activities include:[iii]

1. Delivering in-service educator training that builds on existing quality Environmental Education (EE) programs.
2. Delivering pre-service educator training that enables student teachers and faculty in education departments at colleges and universities to effectively include EE in their teaching.
3. Developing, promoting, and/or providing training on the national EE Guidelines for Excellence, which seek to improve the quality of EE. Supporting state "infrastructure" that enables educators to effectively teach about environmental issues (referred to as "state capacity building").
4. Developing and institutionalizing a materials review process that identifies, evaluates, and promotes quality EE materials.
5. Supporting accreditation efforts to include EE in college and university teacher preparation programs.
6. Supporting states in developing their own environmental educator certification programs.
7. Facilitating access to EE information and materials online by expanding and enhancing existing resource centers.

Environmental Education Grants

Each EPA Region provides local grants annually to applicants that represent a local or state education agency, university, non-profit organization, noncommercial educational broadcasting entity, or tribal education agency. Since 1992, the EPA has distributed between $2 and $3.5 million in grant funding per year for a total of more than $85 million.[iv] A majority of grant funds have been awarded to non-profit organizations, universities, schools, school districts, and school boards.[v] Most environmental grants are geared towards addressing issues with general educational literacy, water, and biodiversity.

EPA Region Five 2020 Grantee Projects

Illinois

Environmental Education Association of Illinois

Earth Force Illinois is a two-year train-the-trainer effort where the Environmental Education Association of Illinois (EEAI) will develop the capacity to train and support urban and rural educators throughout Illinois in the use of the Earth Force Process. Participants will learn, model, and practice Earth Force's six-step process with an emphasis on building youth-adult partnerships, encouraging critical thinking, accessing community resources, approaching stakeholders, and planning and celebrating action. After attending a train-the-trainer workshop, participants will host their own educator workshops, further amplifying the reach of this project. Trained educators will facilitate student-led investigations of environmental issues and the development of action plans to address those issues, with an estimated 250 students. This project will provide 85 K-12 educators with training in what is now known to be some of the most critical steps in the environmental education process when trying to develop an environmentally responsible public.

Michigan

Central Michigan University

H2O Q: Science Based Environmental Education engages teachers, community organizations, and corporate and public partners in experiential field science to help students measure water quality parameters and scientifically analyze and critically apply this data to a local issue affecting the Great Lakes. One teacher leader and one community/environmental leader from five subaward partners throughout Michigan will come to the Central Michigan University (CMU) Biological Station and engage in hands-on learning using the H2O Q kit. Leaders, along with CMU experts will train an additional 40 to 60 middle school teachers with a reach of over 4,000 students in research around water quality issues within their communities. By using the kit to measure the chemistries of water quality, students will gain scientific literacy in issues affecting the Great Lakes region. The overall goal of this project is to educate middle school science teachers and equip them with the critical skills and resources to become effective environmental stewards.

Trout Unlimited

Connecting communities to their local water resources is important to the Great Lakes Region to help protect the largest surface freshwater system on Earth. The goal of expanding Trout Unlimited' s (TU) STREAM Girls Program is to educate more than 275 girls, 35 partners and volunteers, and 1,000 community members across Michigan in water quality issues. Project participants will learn to investigate streams, document their findings, and become environmental stewards by designing and implementing projects to protect water quality. TU will work with partner organizations to deliver STREAM Girls at outdoor locations in the Lower Grand River, Detroit River, and Rouge River Watersheds. By reaching audiences from three of Michigan's top five most diverse counties, this project will provide outdoor and informal education opportunities to girls who have not typically participated in these types of activities, giving them a new perspective on science.

Wisconsin

Neighborhood House of Milwaukee

The goal of the Renew-Recycle- Reclaim (3R) project is to increase access to environmental science education and meaningful conservation activities for more than 1,000 low-income, urban youth of color, ages six to 19 who live in and around Milwaukee, Wisconsin. After receiving training on invasive species identification, integrated pest management, wetland and forest monitoring and surveying, and lesson plan writing, paid interns will implement environmental education activities at local schools and lead field trips to nature centers and local and state parks. Program's interns will lead students in interactive educational sessions using established curricula paired with corresponding stewardship activities, such as building pollinator gardens, wetland species monitoring and bio-blitzes. This combination of lessons and activities will give students multiple opportunities to put what they have learned into practice. The 3R program will strive to create diversity for the natural resources field, starting with elementary school students and impacting youth into postsecondary school.

University of Wisconsin-Madison

The University of Wisconsin-Madison Arboretum and its project partners will work with leaders and residents in the Lake Wingra Watershed to minimize the harmful effects of stormwater that flows from urban land into lakes and rivers. The Water Action to Encourage Responsibility project will engage 15-20 leaders – "social trailblazers" – composed of individuals and policymakers. Outreach will be conducted using custom toolkits, online training, a website and community events. This project will provide a model for community engagement in pressing environmental issues and document how neighborhood-focused efforts can make a difference. By empowering leaders within targeted neighborhoods, this project aims to prepare local communities to address challenges related to the harmful effects of stormwater runoff. The lessons learned and the materials developed during the project cycle will be transferable to watersheds throughout the country. In total, this project aims to reach more than 6,500 local residents.

Environmental Internships & Fellowships

The EPA offers paid and unpaid internships for post-secondary or graduate students. The EPA utilizes a pathways program which consists of an internship program, recent graduates program, and a Presidential Management Fellows Program.[vi] All pathway programs are paid and are available to those lawfully permitted to the U.S. as a permanent resident or otherwise authorized to be employed. The EPA also offers an unpaid volunteer position for students interested in learning more about the EPA. These internships allow for opportunities to explore waste and waste reduction strategies.

WasteWise Tool

Information on topics such as sustainable procurement, composting, and recycling can be found using EPA resources like the WasteWise tool. This tool helps businesses, local governments, and nonprofit organizations track recycling and waste reduction practices at various levels of involvement. Once the annual data is submitted, some organizations are recognized as award winners for their leadership in waste management and environmental stewardship.[vii] This program also provides technical assistance and reduces waste related purchasing and disposal costs for organizations and businesses, allowing for networking and information sharing at the same time.

U.S. Department of Agriculture

The U.S. Department of Agriculture offers several programs, such as GreenSchools and The Children and Nature Initiative, that include providing education on the benefits of waste reduction and solid waste management. The department hosts a Conservation Education website, which provides the details of each program as well as additional educational material for educators and students.[viii]

GreenSchools

GreenSchools teaches educators how to integrate environmental education into their curriculum, conducting a "GreenSchools! Investigation" of a site's use, waste and recycling, water assessment, energy, and environmental quality, and complete "GreenWorks!" service learning projects based on their results.[ix] Grants will be awarded to schools to implement the action plans they developed during investigations.

U.S. Department of Education Green Ribbon Schools

Awarded by the U.S. Department of Education, Green Ribbon Schools are recognized for their efforts to reduce environmental impact and costs, improve the health and wellness of students and staff, and provide effective environmental and sustainability education.[x] The award allows a small number of honorees each year to show how all schools can employ similar practices and utilize resources. Selected schools, school districts and institutions of higher education (IHE), are announced each spring. Awardees receive a plaque, media attention, and state recognition, as well as private sector cash prizes that are encouraged by the Department of Education.

Green Strides

Launched by Green Ribbon Schools, Green Strides is an effort to connect all schools with the resources used by honorees.[xi] Annual reports show replicable practices, newsletters and social media posts share additional resources and practices, and an annual Green Strides tour brings further attention to the honorees and their best practices, some of which can pertain to waste reduction and diversion.

State & Regional Efforts

Guides and educational reference material are common resources at the state and regional level. There are less avenues for funding at this level compared to the national level, and resources and recommendations are less generalized and more specific to the needs and context experienced within the region.

Illinois Environmental Protection Agency

The Illinois Environmental Protection Agency (IEPA) has some of the best regional resources for solid waste management public education for Northern Illinois residents. Other county agencies, whose materials are available online, are good sources of waste guidance outside of Boone and Winnebago Counties' jurisdictional boundaries.

The IEPA, a subsidiary of the federal EPA, offers public education on beneficial sustainability practices, land pollution, and waste disposal, as well as maps to the nearest sites for household hazardous waste. Although the majority of research and data is collected at a state level, items such as the Waste Management Fact Sheet are still relevant at a regional and local level. The IEPA website also publishes region-based landfill reports, providing additional transparency for residents interested in the capacity and disposal volume of their respective landfills.

Environmental Pathways

The IEPA has partnered with the University of Illinois Urbana-Champaign to create new science curricula for fifth and sixth grade educators.[xiii] This includes sections on food waste reduction and landfill diversion. The IEPA also offers a teacher's guide to the environment designed to develop critical thinking skills and make informed decisions about natural resources. Though dated, this guide meets the criteria of the North American Association for Environmental Education's Environmental Education Materials: Guidelines for Excellence.

Illinois Sustainable Technology Center

The Illinois Sustainable Technology Center (ISTC) is a state legislated technical assistance program that works with all sectors (e.g. citizens, business, government) to prevent pollution, conserve natural resources, and reduce waste to protect human health and the environment of Illinois and surrounding areas.[xiv]

Solid Waste Agency of Lake County, IL

The Solid Waste Agency of Lake County, IL (SWALCO) produced a circular economy guide along with recycling guidelines, video library, and healthy home and yard practices that are all accessible on their website.[xv] This source of solid waste education is useful for county residents who are unaware of the processes and benefits of recycling, composting, and a circular economy.

Local Efforts

Public education concerning solid waste is currently limited at the county level. There is opportunity within Boone and Winnebago Counties to increase participation rates by educating residents about the process and benefits of recycling measures, in addition to sustainable waste management practices and diversion options.

Winnebago County Soil & Water Conservation District

Soil & Water Conservation Districts (SWCD) were established in 1937 under the Illinois Soil and Water Conservation District Act, and are local units of government.[xvi] Since they do not have taxing authority, primary funding is provided by the Illinois Department of Agriculture, while additional funding is utilized for operation and education programs. The Winnebago County Soil and Water Conservation District offers a number of environmental education field trip programs, including composting and wildlife conservation.[xvii] The Winnebago County SWCD also provides additional online web pages and educational resources for middle school and younger children regarding recycling and waste reduction.

Boone County Conservation District

The Boone County Conservation District (BCCD) has a "Leave No Trace" page on their website detailing proper waste disposal when on the campgrounds and registration for environmentally involved extracurricular activities.[xviii] Leave No Trace programming for Cub and Girl Scouts utilize waste reduction related issues and behaviors throughout the program. Although the BCCD is primarily geared towards land stewardship and providing outdoor experiences to the youth of Boone County, it is still important to discuss the impacts unmanaged solid waste can have on the surrounding environment, wildlife, and ecosystem.

Keep Northern Illinois Beautiful

Keep Northern Illinois Beautiful (KNIB) offers year-round environmental education programs that focus on waste reduction, reuse, and recycling.[xix] They also offer seasonally themed programs during the spring, summer, and fall. All programs are geared towards children between Pre-K and sixth grade.

Resource Guide

List of Public Educational Resources

National Service Center for Environmental Publications (NSCEP)

Search tool containing links to multitudes of publications related to MSW, hazardous waste, and recycling management.

W https://nepis.epa.gov

Keep Northern Illinois Beautiful (KNIB)

Provides educational materials on waste reduction and recycling practices to businesses, schools, and the public. KNIB has two recycling locations in Winnebago County.

W https://www.knib.org/recycling-center

P (815)-637-1343

E info@knib.org

A Main Office: Rockford Recycle Center 665 Hydraulic Rd. Rockford, IL 61109

Severson Dells Nature Center

The nature center provides online resources for waste reduction and source separation practices in addition to a wide range of other environmental topics.

W https://www.seversondells.com/

P (815)-335-2915

A 8786 Montague Rd., Rockford, IL, USA, 61102

Illinois EPA (IEPA)

Contains state-specific information regarding a diverse variety of environmental topics, including solid waste. IEPA provides educational materials, data, and reports that are accessible to the public.

W https://www2.illinois.gov/epa/Pages/default.aspx

P (217)-782-3397

E EPA.ContactUs@illinois.gov

A 1021 North Grand Ave. East P.O. Box 19276 Springfield, IL 62794-9276

Additional Educational Materials:

- IEPA Food Waste FAQ and Activities Packet
- IEPA Recycling Guidelines

Solid Waste Agency of Lake County (SWALCO)

SWALCO provides insight into the regional solid waste management system of Lake County, IL. Their website includes educational materials regarding waste disposal, recycling, and composting methods in addition to stressing the importance of solid waste management.

W https://www.swalco.org/

P (847)-336-9340 or (847)-377-4950

E info@swalco.org

A 1311 N Estes Street Gurnee, IL 60031

Winnebago County Soil & Water Conservation District (SWCD)

The SWCD is a resource for information regarding soil and water conservation practices and opportunities. Their website contains links to fun educational activities, videos, and texts that are intended for children to learn more about conservation and recycling.

W https://winnebagoswcd.org/swcd/

P (815)-965-2392, Ext. 3

A 4833 Owen Center Road, IL 61101-6007

Boone County Conservation District (BCCD)

The BCCD works to protect the environment by providing web-based and in-person learning opportunities to foster interest in conservation. BCCD hosts environmental programs and events for recreational and educational purposes.

W https://www.bccdil.org/

P (815)-547-7935

A 603 North Appleton Road Belvidere, IL 61008

List of Other Outreach Resources

Illinois Food Scrap Coalition (IFSC)

IFSC is a non-profit organization that provides educational resources to mitigate food waste by placing importance on composting.

W https://illinoiscomposts.org/about-2/

E illinoiscomposts@gmail.com

Illinois Recycling Foundation (IRF)

IRF is a statewide coalition dedicated to outreach and education in favor of waste reduction and reuse.

W https://illinoisrecycles.org/

P (708)-358-0050

A PO Box 411 Geneva, IL 60134

The Illinois Product Stewardship Council (ILPSC)

The ILPSC is an informational council that strives to encourage waste diversion and recycling by placing more responsibilities on waste generators.

W https://illinoispsc.org/about/about-ilpsc

E illinoispsc@gmail.com

Illinois Counties Solid Waste Management Association (ILCSWMA)

ILCSWMA is an informational forum for solid waste management professionals.

W https://www.ilcswma.org/

A 3764 State Route 13/127 c/o Rebecca Tracy Pickneyville, IL, 62274

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

SWANA-IL is an organization committed to making advancements to the solid waste management system through education, advocacy, and research. Their website offers resources, training, and relevant news stories.

W https://swana.org/

P (1-800)-467-9262

E 301.589.7068

A 1100 Wayne Avenue, Suite 650, Silver Spring, MD 20910

Seven Generations Ahead (SGA)

SGA collaborates with local governments, private sectors, and the community to provide outreach and implement projects of various environmental topics, including solid waste.

W https://sevengenerationsahead.org/

P (708)-660-9909

E act@sevengenerationsahead.org

A P.O. Box 3125 Oak Park, IL 60303

School & Community Assistance for Recycling and Composting Education (SCARCE)

SCARCE is a non-profit organization that works to create a sustainable community by providing hands-on education to students.

W https://www.scarce.org/

P (630)-545-9710

E info@scarce.org

A 800 S. Rohlwing Rd (Route 53) Unit D Addison, IL 60101

Wasted Food Action Alliance (WFAA)

WFAA works to reduce the amount of food waste that is landfilled by providing education and programs that encourage donating food, reducing the amount of food that becomes waste, and recycling food waste via composting or anaerobic digestion.

W https://wastedfoodaction.org/

E wastedfoodaction@gmail.com

Inventory of Available Infrastructure

Educational Resources

Utility bills provide educational materials to a large portion of the community.

Public schools educate students on reducing, reusing, and recycling practices that can be taken home and applied to their households.

Garden Prairie Organics, LLC

Compost facility in Boone County that accepts landscape waste.

W http://www.gpocompost.com/default.aspx

P (815)-597-1318

E mike@gpocompost.com

A 11887 US-20, Garden Prairie, IL 61038

Paper Recovery Service Corp (PRSC)

Material recovery facility in Winnebago County that recycles cardboard, scrap metal, and provides on site paper shredding.

W https://www.paperrecovery.com/

P (815)-636-2329

A 7972 Crest Hills Dr, Loves Park, IL 61111

Keep Northern Illinois Beautiful (KNIB)

Provides educational materials on waste reduction and recycling practices to businesses, schools, and the public. Has two recycling locations in Winnebago County.

W https://www.knib.org/recycling-center

P (815)-637-1343

E info@knib.org

A Main Office: Rockford Recycle Center 665 Hydraulic Rd. Rockford, IL 61109

Roscoe Transfer Station

Transfer station located in Winnebago County that accepts drop off of recyclable materials including number one and tow plastics, glass bottles, paper, metals, and aluminum.

W https://www.advanceddisposal.com/il/roscoe/roscoe-transfer-station

P (815)-977-7733

A 13125 N. 2nd Street Roscoe, IL 61073

City of Rockford Household Hazardous Waste Site

Collection site for household hazardous waste in Winnebago County.

W https://www.knib.org/items-taken-at-the-hazardous-waste-site

P This site does not have phone service. Call KNIB at 815-637-1343

A 3333 Kishwaukee St. Rockford, IL 61109

Rock River Valley Composting Facility

Composting facility that accepts commercial and residential landscape waste between the months of April and November.

W https://www.winnebagolandfill.com/compost/

P (815)-874-5870

A 6200 Baxter Road Cherry Valley, IL 61016

Area Salvage and Recycling

Scrap metal facility that is located in Winnebago County. It is open to the public and accepts copper, aluminum, batteries, cast and lead, brass (all types), catalytic converters, computer equipment, and appliances.

W https://www.areasalvageandrecycling.net/

P (779)-500-0162

E supmn24@yahoo.com

A 207 Peoples Ave. Rockford, IL 61104

Cimco Recycling Loves Park, Inc.

Scrap metal facility that is open to the public in Winnebago County. Purchases all grades of ferrous and non-ferrous metals.

W https://www.cimcoresources.com/locations/loves-park-il/

P (815)-986-7211

E info@cimcoresources.com

A 1616 Windsor Road Loves Park, IL 61111

Goals & Recommendations

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.

Rec. 2. Explore, produce, and standardize informative signage for waste and recycling bins within Boone and Winnebago Counties.

Rec. 3. Create, distribute, and regularly update solid waste educational information for Boone and Winnebago Counties' websites.

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.

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

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

Chapter 7: Partnerships, Policy, & Funding

Partnerships

There are many partnership opportunities in the Northern Illinois region for community organizations, private industry, and public partners to collaborate on solving solid waste management problems. Partnership activities consist of but are not limited to: regional drop-off locations, community collection events, expansion of commercial recycling, and educational programming. The following chapter illustrates key partners to target to advance solid waste management in the region.

Goals & Recommendations

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.

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.

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.

Rec. 2. Utilize partnerships with licensed haulers, local governments, and other entities to maximize area capacity and create educational campaigns, programs, and events.

Public Partnerships

Public partnerships capitalize on the collective power of multiple organizations. The following subsections discuss two types of public partnerships: committee creation and joint contracting. Committees can bring together local leadership across municipalities and joint contracting can allow for better negotiation power.

Solid Waste Advisory Committee

A solid waste advisory committee (SWAC) is responsible for investigating current recycling and solid waste practices and recommending options to divert waste from landfills.[i]

A SWAC was created for this Plan update. This committee is made up of waste industry professionals, county administrators, and local citizens who collaborate on plan direction and provide expert advice. Post plan publication, local municipalities could continue having SWAC meetings to receive updates on current efforts.

Joint Contracting

Joint contracting for waste management occurs when multiple municipalities contract to provide, maintain, or operate facilities for the collection, transfer, and disposal of solid wastes.[ii] Local municipalities could work together to develop joint contracting for collection agreements, cross-jurisdictional recycling, or commercial and municipal franchise agreements. The advantage of joint contracting for solid waste is that it could provide lower costs for garbage and recycling services, increase community recycling, and allow for greater accountability over fees.

Community Partnerships

Community partnerships can be mutually beneficial to both parties involved. Municipalities partnering with strong local organizations can have a positive impact on the community. Community organizations often strive to serve their communities as do municipal governments.

Rock River Valley Young Men's Christian Association (YMCA)

The popularity and reach YMCA has within the local community makes it a great candidate for partnership for activities such as co-hosting recycling education events or providing recycling programming. The Rock River Valley YMCA has served approximately 30,000 people through memberships and programs, has had 575 kids enrolled in before and afterschool programming, and has completed 15,675 hours of community service through volunteer initiatives.[iii]

Keep Northern Illinois Beautiful (KNIB)

Keep Northern Illinois Beautiful is a non-profit organization with a focus on recycling education and community outreach. KNIB has two locations: Rockford Recycle Center and Machesney Park Recycle Center. KNIB's mission statement is to "improve our environment through education, public awareness, and community involvement".[iv] Several local municipalities currently partner with KNIB, but can further expand efforts to assist businesses with waste diversion and recycling.

Natural Land Institute (NLI)

The Natural Land Institute is a non-profit organization whose goal is to preserve land for future generations. To date, NLI has protected, managed, and restored 18,000 acres in Illinois and southern Wisconsin.[v] Local municipalities could potentially partner with NLI on educational events about the benefits of waste diversion and other land use related elements in waste management.

Mercy House

Mercy House is a charity shop within the Bethesda Church in Rockford. Mercy House collects various items such as kitchen items, clothing, linens, and nonperishable food items.[vi] These items must be new or like new to be accepted.

Empower Boone Food Pantry

Empower Boone Food Pantry is a charity shop located in Capron. Empower Boone provides food, clothing, and resources to community members in need.[vii] Clothing items accepted are coats, jackets, tops, pants, pajamas, blankets, towels, and other housewares.

Private Partnerships

Private partnerships are useful for municipalities with little to no resources or facilities to recycle materials on their own. The following private organizations were considered as potential partnership ideas for local municipalities should they decide to pursue them. This is not an exhaustive list, rather a fraction of potential private waste management partners in the area.

Winnebago Landfill

The Winnebago Landfill site is privately run by Waste Connections. The company provides solid waste disposal and recycling services throughout Northern Illinois. Local governments could partner with Winnebago Landfill, a private landfill, to develop joint action agencies made up of multiple government entities where data is shared, planning efforts are aligned, and potential contracts are generated.

Area Salvage and Recycling

Area Salvage and Recycling is a recycling center located in Rockford that pays customers for their recyclables. The center collects vehicles, scrap metal, equipment, and other materials from residents and businesses. Partnering with a business like Area Salvage Recycling could be beneficial as residents may be incentivized by the financial compensation for their recyclables.

Paper Recovery Services Corporation

Paper Recovery Services Corporation is a recycling organization that offers customers shredding and destruction of paper materials and buys ferrous and non-ferrous scrap metal materials of all types and sizes. Local municipalities can partner with Paper Recovery Services Corporation to increase commercial recycling of paper and scrap metal.

Best Buy

Best Buy, located in the City of Rockford, has electronic waste recycling collections and promotions. Best Buy allows recycling of up to three items per household per day. Eligible items include: TVs and videos, computers, cell phones and radios, appliances, ink and toner, audio equipment, music and movies, video games and gadgets, cameras and camcorders, car audio, video, and GPS devices.

Staples

Staples, located in the City of Rockford, has free recycling services offered which focus on a wide range of items. Eligible items include: Accessories/adapters/cables, all-in-one computers, cable/satellite receivers, calculators, camcorders, CD/DVD/Blu-ray players, coffee brewers (less than 40 lb.), computer speakers, connected home devices, copiers, cordless phones, desktop computers, digital cameras, digital projectors, eReaders, fax machines, flash drives, gaming consoles/handhelds, GPS devices, hard drives, iPod®/MP3 players, keyboards & mice, laptops, mobile phones, modems, monitors (including CRT, LED/LCD, plasma), printers/multifunction devices, routers, scanners, shredders, small servers, stereo receivers, tablets, UPS/battery backup devices, video streaming devices (Apple TV®, Roku Player, etc.), and webcams.

Local governments may further explore community e-waste event partnerships with private retailers.

Policy: Regulation & Legislation

Strategic policy actions at all levels of government support efforts to reduce waste, solve waste-related public health issues, and ultimately reduce pollution. Regulation and monetary penalties can be used to incentivize waste diversion efforts and waste-related behaviors among consumers and manufacturers. Local, state, and federal governments have frameworks within which they can operate in the most cost-effective way possible while protecting public and environmental health.

Goals & Recommendations

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.

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.

Rec. 2. Support local government bans or fees to reduce the number of single use plastic bags within the next 10 years.

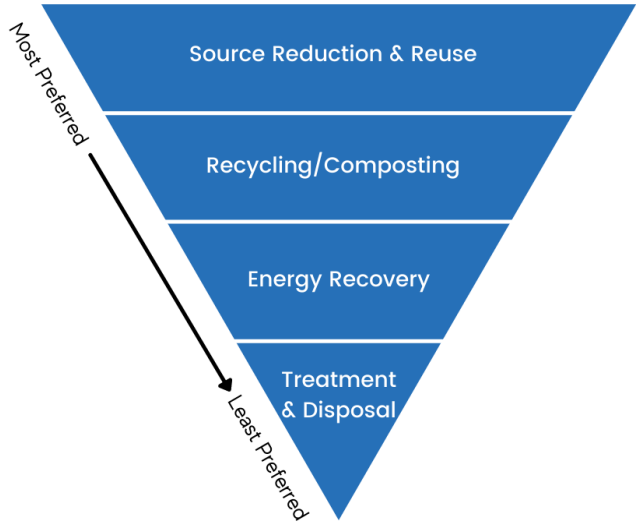
Goal 3. Incentivize waste-related GHG emissions reductions and the use of emerging technologies through local policy.

Rec. 1. Evaluate and consider alternative technologies, taxes, and subsidies for materials management.

State Policy

Statewide policy, legislation, and regulation related to solid waste management in Illinois is primarily maintained by the Illinois General Assembly (IGA) and the Illinois Environmental Protection Agency (IEPA).[viii] The State of Illinois has three separate laws that regulate waste management: the Illinois Solid Waste Management Act, the Illinois Solid Waste Planning and Recycling Act; and the Illinois Environmental Protection Act.

Figure 7-1. Waste Management Hierarchy



Source: EPA

The Solid Waste Management Act (1965)

The Illinois Solid Waste Management Act (SWMA) established a waste management hierarchy based on the EPA standards in 1965. The preventative strategy of source reduction and reuse is the most preferred waste management method as outlined in this Act, with waste treatment and disposal being the least preferred. Additionally, the SWMA requires state-funded colleges and universities to create waste reduction plans and corresponding five-year updates. The IEPA reviews and approves these updated plans.

The Illinois Solid Waste Planning and Recycling Act (1990)

The Illinois Solid Waste Planning and Recycling Act (SWPRA) required all Illinois counties to develop solid waste management plans by March 1, 1995. SWPRA encouraged counties to use multi-county planning processes via intergovernmental agreements. The first plans also required details regarding recycling programs and implementation, with the initial goal of 25 percent of municipal solid waste generated to be recycled annually. The IEPA reviews and approves the county plans and five-year updates.

The Illinois Environmental Protection Act (1970)

The Illinois Environmental Protection Act (EPA) regulates several environmental pollutants including used tires, refuse, and facilities such as landfills and compost sites. Unlike recycling centers, "non-clean" material recovery facilities (MRFs) require permits and are limited in what they can accept. This act banned several dangerous items from landfills, such as yard waste, car batteries, tires, large appliances, used oil, and many electronic products, or E-waste (see the Electronic Products Recycling and Reuse Act). The IEPA also authorized surcharges on tipping fees at Illinois landfills and retail fees on tires in Illinois. All of these regulations aim to decrease the volume of waste on a statewide level, protect the environment from harmful toxins, and act as revenue generation for the Solid Waste Management Fund, the IEPA, and the Illinois Emergency Public Health Fund.[ix]

The Illinois Pollution Control Board (IPCB) was constructed as a result of this Act. The Board is independent from the IEPA and serves as an impartial decision maker responsible for managing and constructing Illinois environmental control standards, determining alleged non-criminal Act violations, reviewing permit and determination appeals, and pollution control facility siting determinations set forth by local government. The Board has several law and rulemaking developments listed on their website, including the Environmental Protection Act and Title 35 Procedural and Environmental Rules. A portion of the provisions detailed in Title 35 of the Illinois Administrative Code aim to streamline the permitting process and operational guidelines for entities that work with hazardous waste near drinking wells or within a Superfund site.[x]

Consumer Electronics Recycling Act (2017)

The Consumer Electronic Recycling Act (CERA) went into effect in 2017 to update electronics recycling for the State of Illinois upon the termination of the Electronic Products Recycling and Reuse Act (EPRRA) in 2020. Consumer technology has significantly advanced since 2008 when the EPRRA was first established, requiring an update to the Act.

CERA related programming officially started in 2019. The law specifies that each Covered Electronic Device (CED) manufacturer must provide an annual E-waste program plan and is also responsible for conducting it. Recyclers must pay an annual registration fee ($3,000), and CEDs must be accepted at program collection sites at no cost (excluding monitors and computers).

National Policy

Along with EPA programs, several pieces of legislation have been passed by Congress and regulated by the EPA in an attempt to protect human and environmental health through the reduction of waste.[xi]

The Resource Conservation and Recovery Act (RCRA) of 1976 (Formerly SWDA 1965)

The Solid Waste Disposal Act (SWDA) of 1965 improved disposal methods and was amended by the Resource Recovery Act of 1970 and eventually the Resource Conservation and Recovery Act (RCRA) of 1976. These amendments provided funding for the EPA's resource recovery programs and cradle-to-grave management of hazardous waste. Compliance monitoring for RCRA is delegated to the states and local authorities. This act is essential to ensuring the environmental and public health of local communities.

The Act also established six other major amendments over the next 20 years: the Used Oil Recycling Act, Solid Waste Disposal Act Amendments, Hazardous and Solid Waste Amendments, Medical Waste Tracking Act, Federal Facility Compliance Act, and the Land Disposal Program Flexibility Act. These acts provide a regulatory framework for Treatment, Storage, and Disposal Facilities (TSDs), source reduction and reuse, hazardous waste, waste transporters, waste generators, and other pollution prevention techniques.[xii]

Economic Incentives

Economic incentives are utilized by all levels of government in the U.S. to prevent various acts of environmental pollution.[xiii] Some of these economic incentives include: fees, charges, and taxes; deposit-refund systems; marketable permits; subsidies; liability; information disclosure; and voluntary actions. Waste-related fees are a strategy to change disposal behavior with cost based on volumes and material type, and may discourage haulers from excessive disposal or encourage more stringent material diversion. Other examples include consumer product waste subsidies that reward waste minimization through tax breaks or credits.

In Boone and Winnebago Counties, residents are able to trade unwanted items for cash at locations like Area Salvage and Recycling, previously identified in the local partnership opportunity subsection. Private businesses can incentivize waste reduction by offering discounts for personal cups or charging fees for single use bags. These efforts are mutually beneficial, as they provide cost savings for both consumers and business owners.

Traditional Regulatory Incentives

Performance Based Standards

In contrast to regulatory mandates, market-based incentives encourage the private sector to factor waste minimization into production decision making. Pollution taxes and waste hauler disposal fees can provide economic and environmental benefits by incentivizing firms to operate their business competitively while decreasing pollution.[xiv,xv]

Pollution taxes do not regulate pollution at all, and instead charge a certain amount for each ton emitted. This method establishes a price for carbon but doesn't measure emissions, instead allowing businesses to reduce their pollution in order to remain competitive and avoid paying the fees. Additionally, solid waste disposal fees regulate waste disposal on a smaller scale. Disposal fees may regulate waste by volume or material type, and are dependent on target materials and local context. A higher waste disposal fee will incentivize companies to find another way to dispose of materials instead of in landfills. These fees (enabled by the State's Environmental Protection Act (415 ILCS 5/), go into a fund maintained by Winnebago County, which is discussed in subsection Funding.[xvi]

Product Design Standards

Other examples of private incentives are hazardous waste management liabilities for companies that frequently work with these materials. Hazardous waste management liability regulation provides the legal infrastructure to hold manufacturers accountable for related damages. For consumers, a container deposit law or "Bottle Bill" encourages consumer product recycling and decreases littering by requiring refundable deposits on beverage containers. Product material costs such as glass, plastic, or aluminum are temporarily increased and consumers must recycle them to recover the deposit.[xvii] Bottle bill states have an approximate 60 percent beverage recycling rate, compared to non-deposit states, around 24 percent.

Figure 7-1. Advantages of "Bottle Bills"

Source: Container-Recycling.org

There are many factors to consider when weighing the options of market-based incentives, but market-based approaches for environmental protection are frequently used in modern policy making across the world.[xviii]

Existing Waste Ordinances & Recommendations

Regional Pollution Control Facility Siting Ordinance Provisions

Boone and Winnebago Counties' Codes of Ordinances regulate several areas of waste management by addressing restrictions, associated penalties, and permit requirements. These ordinances are put in place to protect citizens from improper disposal methods and to provide guidance on safety and cleanliness standards. Reviewing current legislation allows for analysis of existing policy, public education on the current policies, and development of new recommendations to reduce gaps or meet new goals. A full list of existing waste-related ordinances for Boone and Winnebago Counties can be found in Appendix C: Existing & Model Ordinances.

Boone County Existing Ordinances

Existing Boone County ordinances outline specific restrictions on waste transportation, recycling, and disposal. One of the key ordinances include stipulations such as required monthly reports of waste-related activities to be filed by all collection, disposal, and transportation persons in the county. These reports, as well as disposal facilities and transportation vehicles, are subject to inspections. The five transportation restrictions pertaining to waste include:

- The prohibition of transporting garbage over 25 miles from the disposal area;
- Transporting garbage from outside the county except in totally enclosed trucks or units;
- Transporting garbage that has not been deposited in a state-approved landfill within 24 hours of the time it is collected;
- Transporting garbage in the county outside of the hours of 6:00 a.m. to 6:00 p.m.; and
- Transporting garbage into or out of the county by any other method except motor vehicles.

Additionally, the associated violations and permit requirements that are outlined in Boone County ordinances pertain to property owners, landfill operators, and garbage haulers. Boone County requires all waste haulers to sell or provide customers with recycling containers and regular collection services for items specified by the county. The specified items are newsprint, clean glass, aluminum, steel or tin food, and beverage bottles or containers. Other items may be collected by haulers at their discretion. Recycling and garbage collection occur on the same day, with garbage collection taking place at least once per week and recycling at the discretion of the hauler, but no less than once per month.

Overall, it is written that all waste haulers and occupants of a dwelling or dwelling unit shall store, transport, and dispose of all rubbish in a clean, sanitary, and safe manner. This includes within the county's sanitary landfills, in closed containers resistant to pests, and/or in vehicles constructed to contain all contents to minimize nuisances.[xix]

Winnebago County Existing Ordinances

While Winnebago County has over five times the population of Boone County, the County includes many of the same waste ordinances. However, Winnebago County includes more details in some areas like storage. For example, all occupants are responsible for the cleanliness of garbage containers and bulk storage containers that must be kept on premises and used in conjunction with plastic bags or liners. Owners of dwellings with three or more units and the occupants of dwellings with one or two units are responsible for maintaining the premises and supplying facilities for the safe and sanitary storage and disposal of garbage. Similar to Boone County, all county inhabitants must store, collect, transport, and dispose of garbage in an approved manner and suitable container at least once per week. Permits, inspections, insurance fees, violations, and penalties are explicitly reviewed for those who own and operate transportation vehicles or sanitary landfills. Violations can be applied to dwelling occupants or property owners who refuse or neglect garbage removal. Based on the County's Code of Ordinances, penalties may include fines of varying degrees, with each day's failure to comply constituting a separate violation.[xx]

Recommendations

The current ordinances for Boone and Winnebago Counties provide the basis for a safe waste management system. The following are recommendations to address gaps present in these ordinances. Additional ordinance recommendations can be found in Appendix C: Proposed Tactics & Timelines.

Ordinance Recommendation #1

Currently, only Boone County includes language for waste hauler reporting requirements in their Code of Ordinances. Under Ch. 34, Article II, Sec. 29 Monthly reports of collectors, Boone County has established requirements for waste collection personnel to report waste characteristics on a monthly basis.[xxi] Such characteristics include the number of hauling vehicles utilized and the nature, source, and tonnage of refuse that is collected, transported, and disposed. In addition to this, Boone County also includes language in their ordinance about the mandatory reporting of recycling collection and utilization information. On a quarterly basis, reports are required on the type of recyclables collected, prices per unit, and revenue produced by its sale. It is recommended that Winnebago County establish similar ordinances as Boone County requiring an annual report of disposal characteristics in order to address gaps in waste reporting. This will increase availability of data for analysis when reporting on goal progress. In order to ensure transparency and increase awareness, it is recommended that both counties require reports to be shared publicly via media advisories for municipalities and accessible on websites.

Ordinance Recommendation #2

To encourage increased waste diversion, both counties should include language regarding source separation and source reduction. These practices work to minimize the amount of waste that is generated by separating or reducing it at its source. This can be accomplished by implementing an ordinance that requires the separation of waste, recyclables, and compostables at the point of disposal. Another method to encourage source separation is the establishment of a Pay-As-You-Throw (PAYT) program, in which waste disposal costs are dependent on the amount of waste generated. County ordinances may also include building regulations regarding waste infrastructure. These ordinances can include mandatory recycling areas to meet capacity requirements. Taxes and bans on difficult to recycle materials may also be included in county ordinances. The model ordinances detailed in [Appendix C: Existing & Model Ordinances] utilize plastic bags as an example material and outlines the process of implementing specific material bans and taxes.

Funding

Securing funding is critical for the implementation of solid waste management plans. There are several opportunities for funding from local, state, and federal sources. These sources include grants, initiatives, programs, or projects that could impact solid waste management in the region.

Goals & Recommendations

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.

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.

Current Waste Revenue

Boone and Winnebago Counties use the Winnebago Landfill to dispose of a majority of their waste. The Winnebago Landfill pays host fees to their siting authority, Winnebago County, for each ton of waste deposited into the landfill.[xxii] The host fee is an agreed-upon amount paid to Winnebago County, in addition to taxes and other fees the Winnebago Landfill is responsible for paying. These fees go directly to Winnebago County's general fund and are used at the discretion of the Winnebago County Board. Boone County currently has no identified revenue to support its waste management efforts.

Local Funding Sources

Boone and Winnebago Counties contract out waste hauling and landfill services through private companies. County residents and business owners pay fees directly to the appropriate private waste hauler in their area, which funds the waste management in the community. In contrast, other communities have publicly run waste management services which utilize additional funding sources.

Additional Funding Sources

City revenues – Municipalities can use a portion of general revenues (such sales or property taxes) to fund solid waste management programs.

User fees – User fees are a common source for funding community-based solid waste management, which include landfill dumping fees and waste collection fees.

Sale of recyclables – Municipalities can earn revenue from the sale of certain recyclables.

Tipping fees – Municipalities can charge fees to surrounding communities that use a locally owned landfill.

Bulk collection fees – Municipalities can charge for one-day pick up of bulk items.

Source: SWM Programs Zender Group

State Funding Sources

Illinois Department of Commerce and Economic Opportunity

The Community Development Block Grant (CDBG) Public Infrastructure Program provides federal funding for community-based projects in non-metropolitan areas. The program consists of the following components: Housing Rehabilitation, Public Infrastructure, Disaster Response, and Economic Development. Public infrastructure CDBG funds could potentially go towards funding solid waste management facilities.[xxiii]

With a maximum request of $550,000, local governments can use the funds towards public infrastructure and improvement of public health, safety, and welfare.[xxiv] Additional information can be found on the Illinois Department of Commerce and Economic Opportunity website.[xxv]

Federal Funding Sources

The Environmental Protection Agency (EPA) provides financial assistance for land, air, and water-related projects. Annually, the EPA awards more than $4 billion in funding for organizations focused on environmental goals.[xxvi]

Multipurpose Grants to States

Multipurpose Grants to States (MPG) are funded by the EPA to provide funding to states, tribes, and territories for high priority activities that complement programs under established environmental statutes. States are encouraged to consider using MPG funds to address per- and polyfluoroalkyl substances (PFAS) and other emerging contaminants.[xxvii] States can also use funds on advancing environmental justice and tackling climate change.xxviii Multipurpose grants could fund recommendations for solid waste management that advance environmental justice areas and lower GHGs from waste management activities.

EPA intends to award $8,500,000 to eligible state and territorial recipients with a base award amount of $25,000.[xxix] This funding could be given to subrecipients, which could allow local governments to execute aligned projects. MPG funding authority does not have a match, cost share, or maintenance of effort requirement.[xxx] FY2021 deadline has passed; however, it is likely this program will continue as it has been awarded since 2018. Additional grant information can be found on the EPA website.[xxxi]

Air Grants and Funding

The Air Grants and Funding Program has grant funding announcements for projects and programs relating to air quality, transportation, climate change, indoor air, and other related topics.[xxxii] Air grants could fund recommendations for solid waste management that would improve air quality, such as composting to divert food waste from landfills and reduce methane and carbon dioxide emissions. Eligible entities vary by funding announcement. Additional information can be found on the EPA website.[xxxiii]

The Environmental Justice Collaborative Problem-Solving (CPS)

Cooperative Agreement Program

The Environmental Justice Collaborative Problem-Solving (CPS) Cooperative Agreement Program provides funding for eligible applicants for projects that address local environmental and public health issues within an affected community.[xxxiv] The CPS Program helps communities address environmental and public health concerns. Around $3.2 million funds have been distributed, with awards of up to $200,000 each for two-year projects.[xxxv] The program funding is now closed for FY2021. Eligible entities are non-profit organizations. Local governments could collaborate on project ideas and assist in the application process with local non-profits. Additional information can be found on the EPA website.[xxxvi]

Pollution Prevention (P2) Grant Program

Pollution Prevention (P2) Grant Program provides matching funds to state programs that support pollution prevention and develop state-based programs.[xxxvii] P2 funding can provide technical assistance to businesses to develop source reduction practices with the goal of reducing or eliminating pollutants from entering the waste stream prior to recycling, treatment, or disposal.[xxxviii] Businesses generate large amounts of waste depending on their industry and size. Eliminating waste before it enters the waste stream is an essential component in solid waste management and could have a dramatic impact on the region. A total of $9.3 million in funding has been awarded to 42 organizations for FY2020-FY2021 grants.[xxxix] The deadline for applications has closed. Additional information can be found on the EPA website.[xl]

Office of Land and Emergency Management Grants and Funding

The Office of Land and Emergency Management Grants and Funding provides competitive grant funding announcements for projects and programs relating to brownfields, federal facilities restoration and reuse, solid waste management, resource conservation and recovery, underground storage tanks, and other related topics.[xli] Applying for funding related to solid waste management would support the implementation of projects for the Regional Solid Waste Management Plan. Additional information can be found on the EPA website.[xlii]

Office of Resource Conservation and Recovery

The Office of Resource Conservation and Recovery (ORCR) promotes conservation, proper waste management, and oversees cleanup of land for productive use.[xliii] The ORCR manages several programs and projects that promote reduction in waste and proper waste management.

One of their programs is Sustainable Materials Management (SMM), where the EPA provides public recognition and awards to SMM Electronics Challenge participants for their commitment to sustainable materials management and recycling electronics responsibly.[xliv] Local governments could collaborate with local private electronics recycling companies like Best Buy or Staples to apply for the SMM recognition. Additional information can be found on the EPA website.

Private Funding Sources

Closed Loop Partners

Closed Loop Partners funds replicable, scalable, and financially sustainable recycling infrastructure and innovation projects across four primary categories:[xlvi]

- Collection
- Sortation
- Processing or reclamation
- End product manufacturing

Closed Loop Partners provide zero interest loans to municipalities and below market rate loans to private companies. The typical loan size is between $3 million to $5 million dollars over a three to 10-year term.[xlvii] Additional information can be found on the Closed Loop Partners website.[xlviii]

Recycling Partnership Cart Grant

Grant funding ranging from $300,000 to $825,000 is available to support publicly sponsored curbside recycling programs. The applicant must be a local government, solid waste authority, or federally recognized tribe and must provide or intend to provide curbside recycling collection on a weekly or every-other-week basis.[xlix] This grant program allows communities to consider different implementation strategies, from providing every household in the jurisdiction with a recycling cart, to implementing cart-based collection in phases or even allowing citizens to opt-in or opt-out out of recycling service.[l] Additional information can be found on the Recycle Partnership website.[li]

Environmental Research & Education Foundation (EREF)

The Environmental Research & Education Foundation (EREF) is a private grant making institution that funds solid waste research and education initiatives with $15,000 to $500,000 grants.[lii] Typical projects last two years and there are two deadlines a year (December 1 and May 1) for proposals on the following topics:

1. Waste minimization
2. Recycling
3. Waste-to-Energy (WTE), biofuels, chemicals or other useful products. This includes, but is not limited to, the following technologies:
   - Anaerobic digestion
   - Composting
   - Other thermal or biological conversion technologies
4. Strategies to promote diversion to higher and better uses (such as organics diversion, market analysis, optimized material management, logistics, etc.)
5. Landfilling

Additional information can be found on the EREF website.[liii]

Patagonia Environmental Grant

Patagonia is a private company that offers grants ranging from $2,500 to $15,000 to support environmental organizations with an emphasis on bold action, public engagement, and inclusion.[liv] Local municipalities could partner with environmental organizations to apply for grant funding for a major project in the area. Additional information can be found on the Patagonia website.[lv]

The purpose of the goals and recommendations outlined in the Plan above are to provide a framework for the successful implementation of waste reduction and diversion strategies for Boone and Winnebago Counties. These goals will serve as a pathway for both counties to deal with future waste capacity constraints by focusing on building a sustainable solid waste management system that addresses community concerns, environmental impacts, and economic development. Moreover, these goals will connect existing resources and partners together with the common aim of improving the current solid waste management system in the region.

Summary of Goals & Recommendations

To create this framework, the Plan first identified key themes or groups under which to list the goals. These themes were material diversion, public education and outreach, circular economy and GHG emissions, system organization and administration, partnerships, policy, and funding. Under each theme, a set of goals, recommendations, and actions were identified, along with the responsible and supporting parties, funding needed, and projected timeline. In an effort to address the many facets of the solid waste management system, both quantitative and qualitative selections were considered. The full list of goals, recommendations, and actions were reviewed by the Solid Waste Advisory Committee (SWAC) to gather additional feedback.

Collectively, these goals, recommendations, and actions form the building blocks for the counties to take action towards meeting their long-term zero waste goals. As identified throughout this planning process, efforts to meet these goals will require significant resources and collaboration. Moving forward, this framework will be used on a continuous basis for all parties to track progress, achievements, and to revise if necessary.