



# Indiana Recycling Infrastructure & Economic Study

Presented to



Prepared by



July 2021

## TABLE OF CONTENTS

<b>Executive Summary .....</b>	<b>2</b>
A. Current Waste and Recycling Infrastructure .....	2
B. Economic Impact on the States Economy .....	3
C. Recommendations and Conclusions.....	5
<b>Introduction .....</b>	<b>7</b>
A. Project Partners .....	9
B. Key Stakeholders .....	11
C. Methodology.....	12
<b>Part 1. Current Waste and Recycling Infrastructure .....</b>	<b>14</b>
A. General Locations and Definitions .....	14
B. Disposal Infrastructure .....	18
C. Recycling.....	26
<b>Part 2. Economic Impact on the State's Economy .....</b>	<b>45</b>
A. Methodology.....	45
B. The Economic Contributions of the Recycling Industry.....	47
C. Economic Impact of Indiana Manufacturers and End Users that Use Recycled Commodities .....	53
D. Increased Demand Based on Survey Responses .....	72
E. Tax Revenue Generated from the Recycling Economy .....	74
F. Comparison to Institute of Scrap Recycling Industries (ISRI) .....	75
<b>Part 3. Conclusions and Recommendations .....</b>	<b>77</b>
A. Data Collection.....	77
B. Materials Management Planning.....	81
C. Indianapolis and Marion County.....	83
D. State and Local Funding .....	87
E. Recycling Collection Programs .....	89
F. Recycling Processing.....	91
G. Organics & Food Waste .....	92
H. Grant Programs.....	92
I. Economic Development .....	93
J. End User Recycling Markets .....	94
K. Public-Private Partnerships .....	96
L. Recommendations Summary .....	97

## Appendices

Appendix A. 2019 Community Recycling Survey  
 Appendix B. 2019 Solid Waste District Recycling Survey  
 Appendix C. Municipality Survey  
 Appendix D. 2019 End User Recycling Survey  
 Appendix E. Compost and Wood Grinder Facilities  
 Appendix F. NAICS Codes  
 Appendix G. Maps in Study



## EXECUTIVE SUMMARY

Across the country, states and communities are evaluating their solid waste and recycling systems to gain a comprehensive understanding of their functionality and effectiveness. This evaluation is an important step in understanding the strengths and weaknesses of the solid waste and recycling systems and in identifying opportunities for changes and capital investment that can make the biggest impact for a circular economy. This study includes a comprehensive review of Indiana's recycling infrastructure and its economic impact. In addition, specific recommendations have been outlined to improve recycling to maximize its impact in the circular economy.

Indiana's recycling rate was calculated at 19%<sup>1</sup> in 2019 and includes residential, commercial, and industrial recycling from municipal solid waste (MSW). In the Midwest, recycling rates are typically highest in the industrial sector followed by the commercial sector with the residential sector having the lowest recycling percentages. Since recyclables normally get reported by regional material recovery facilities (MRF), commercial and industrial sector companies that generate recyclables are not required to report recycling data to the Indiana Department of Environmental Management (IDEM). However, some do not use the Indiana MRF system and directly ship recyclables to end users, thus the overall recycling percent is probably higher than 19%.

Nationally, the Environmental Protection Agency (EPA) has calculated recycling at 32% for 2020. The State of Indiana's recycling rate is low compared to other states and the average landfill tipping fee is the lowest in the Midwest at \$36.27 per ton<sup>2</sup>. Indiana's recycling rate is below the state recycling goal of 50% as established by IC 13-20-25-1 in 2014. Recycling programs nationwide have experienced significant economic challenges because of low commodity prices and cheap disposal. This is especially true for midwestern states where landfill rates are among the lowest in the country.

### A. CURRENT WASTE AND RECYCLING INFRASTRUCTURE

Solid waste generation in Indiana in 2019 was approximately 8.8 million tons with 76% being disposed of in landfills, 5% to waste-to-energy and 19% diverted through recycling.<sup>3</sup> See **Map 1A-1** for solid waste and recycling infrastructure in the State of Indiana.

The Indiana recycling collection infrastructure has seven major regional Material Recovery Facilities (MRFs) that process and sort single stream recycling materials for end users as well as several other large regional MRF's that focus on source separated recyclables. These MRFs receive recycling materials collected from residents from curbside programs, recycling drop-offs, and containerized collection systems for businesses in the industrial, commercial, and institutional (ICI) sectors.

<sup>1</sup> IDEM 2019 Recycling Activity Summary.

<sup>2</sup> Environmental Research and Education Foundation "Analysis of MSW landfill tipping fees 2020".

<sup>3</sup> IDEM 2019 Recycling Activity Summary.

Based on data collected, approximately 57% of residents, or 197 communities, in Indiana have access to subscription (pay to recycle) or non-subscription (recycling included in curbside service) recycling programs. Residential participation in non-subscription recycling programs is typically significantly higher than subscription (pay to recycle programs). Indianapolis has a subscription curbside recycling program.

Recycling access also includes 313 recycling drop-offs located throughout the State with 97% of the counties having either curbside recycling or drop-offs available for residents. See **Map 1C-4** for curbside and drop-off recycling locations in Indiana. Other recycling infrastructure includes solid waste transfer facilities which receive MSW for disposal and may also have programs to extract recyclables from the MSW or receive source separated recyclables for transfer to MRF's. Approximately 41% of the solid waste transfer facilities reported shipments of recyclables through the IDEM Re-TRAC reporting system.

Indianapolis, the largest city in Indiana, is the nation's 14<sup>th</sup> largest city, and it is a significant contributor to Indiana's economy. However, Indianapolis has one of the lowest recycling rates in the country at 7% and is the biggest municipality without a non-subscription curbside recycling program (recycling included in curbside service). If Indianapolis were to implement a non-subscription curbside recycling program the recycling percent could increase to 15%-20%<sup>4</sup>-or more. An increase of up to 20% recycling may require additional investments in collection and processing infrastructure. Implementing a non-subscription recycling curbside program would require a comprehensive planning approach with significant stakeholder input. See **Map 3C-1** for recycling infrastructure for Indianapolis/Marion County and surrounding counties. The study recommendations also include creating a solid waste district for Marion County and development of a materials management plan.

Recycling infrastructure and programming throughout the state would benefit from a materials management planning process for the solid waste districts. The plans could establish recycling goals and objectives with stakeholder input at the local level. Each district could create recycling programs and education outreach plans for the residential, industrial, commercial, and institutional sectors.

## B. ECONOMIC IMPACT ON THE STATE'S ECONOMY

---

This economic portion of the study focuses on two areas of the circular economy in Indiana, the supply side collection and processing of recyclables and the demand side end users of recycled commodities.

The economic study used tonnages reported through the IDEM Re-TRAC, Solid Waste and Recycling Data reporting system which represents recycling tons collected and delivered to Indiana's recycling infrastructure evaluated in this report. It does not include direct end-use shipments of recyclables from commercial and industrial generators who

---

<sup>4</sup> Recycling rates could vary depending on the specific program, but similar sized cities achieve these recycling percentages for non-subscription curbside recycling.

are not required to report and did not respond to the surveys as part of this study. For employment, North American Industrial Classification System (NAICS) codes were used to estimate employment. Both the Re-TRAC recycling tons and the NAICS codes were the primary inputs for the IMPLAN model which is a commonly used input-output model for these types of analysis.

Indiana's supply side recycling collection and processing provided 397,831 tons of recycled commodities (glass, metals, paper, plastic but excluding mixed recyclables and organics) amounting to an estimated \$24 million to Indiana end users in 2019. Exports delivered out-of-state of the same commodities was 405,397 tons amounting to an estimated \$26 million to end users outside Indiana. In addition, another 138,429 tons of recycled commodities were shipped through brokers to unspecified locations with an estimated value of \$12 million.

The supply side recycling collection and processing infrastructure employment is estimated at 4,255 direct employees and 4,278 indirect employees for a total estimated compensation of \$513 million. The full impact or multiplier effect of these wages on Indiana's economy is estimated at \$1.7 billion. The estimated tax contribution for the recycling collection and processing infrastructure is estimated at \$131 million.

The commodity value impact for 397,831 tons of recyclables provided by the supply side recycling and processing system to Indiana's end users is low. The end user employment created to support the recyclables is estimated at 285 direct employees with an estimated \$13 million in total compensation and a full economic impact of \$42 million. The total tonnage of recycling to the end users is understated by the tons of recyclables that were not reported through the Re-TRAC reporting system and was not responded to surveys for this study. Also, the usage of recyclables by in-state end users is much greater than the in-state supply.

Indiana's end users or demand side employment that may use recyclables as a portion of their feedstock or input provide significant employment and economic value to the economy. Total employment compensation and full impact to the economy is estimated by commodity in the table below.

	<b>Glass</b>	<b>Metals</b>	<b>Fiber</b>	<b>Plastics</b>
<b>Direct Employment</b>	4,433	96,170	10,114	32,713
<b>Indirect Employment</b>	4,685	170,056	10,678	28,194
<b>Total Employment</b>	9,118	266,226	20,792	60,907
<b>Compensation</b>	\$570 million	\$17 billion	\$1.3 billion	\$3.5 billion
<b>Total Output</b>	\$2.6 billion	\$95 billion	\$5 billion	\$14.5 billion

Indiana has significant recycling end user industries, however, the recycling infrastructure evaluated in this study represents the supply side primarily residential and some of the commercial collection and processing. While a large tonnage of recyclables is reported from the ICI sectors, the full impact of recycling to the end users is understated. To determine the full impact of all recycling to the end users' significant changes are needed on data collection from end users. Also, materials management



plans are needed to account for and plan for the full circular economy beyond the residential and portions of the commercial recycling.

Limited end user surveys were received for the study. From the data received, it was estimated that 50% of the end user survey respondents suggested they would use more recyclables collected in Indiana if available. This increase in supply could be delivered in two manners; 1. by increasing the capture rate of recyclables or 2. decreasing the amount exported out-of-state. If this supply and demand increased, there would be an estimated 22% increase in the tons of recycled material. This increase would result in 922 direct jobs and 927 indirect jobs for the supply side collection and processing infrastructure. Total compensation would increase by \$111 million with a full impact of \$376 million to the economy. It should be noted that increases to the supply of recycling to end users may not have a significant impact because the additional recyclables may simply replace recyclables from out-of-state or virgin materials. Increasing recyclable tons to end users does not increase demand for their products or outputs. However, increasing investment in end users' facilities and production capacity utilizing recycling feedstock could result in increased end user economic impact to the economy.

### C. RECOMMENDATIONS AND CONCLUSIONS

---

There are twenty-four recommendations that were identified for the improvement of the supply side recycling collection system and the demand side end users that make up the circular economy. The recommendations focus on the following eleven key areas.

- Data Collection
- Materials Management Planning
- Indianapolis and Marion County
- State and Local Funding
- Recycling Collection Programs
- Recycling Processing
- Organics & Food Waste
- Grant Programs
- Economic Development
- End User Recycling Markets
- Public Private Partnerships

These recommendations represent key elements of a comprehensive approach to achieve the 50% recycling rate and further develop a circular economy. These recommendations are not a complete list and will need to be further explored and vetted. The recommendations also demonstrate the level of commitment required to achieve recycling goals and provide for the continued development of the circular economy in Indiana.

Too often, recycling is viewed from a singular perspective of economic cost versus disposal. A state goal of 50% is very difficult to achieve for any state, including Indiana,

without significant commitments to all elements of the solid waste system. A holistic economic approach is needed and will require a coordinated public/private commitment throughout the solid waste system, recycling markets, and end users. In concept, the circular economy makes intuitive sense; however, changes are needed to fully develop a complete and comprehensive materials management system for a circular economy. Many communities prepare circular economy, zero waste, or sustainability plans, but the solid waste and recycling objectives and goals continue to be the most challenging and difficult to achieve. A holistic approach means that the economics of a materials management plan must evaluate the total cost for a solid waste system that includes both disposal and recycling.

To achieve the 50% recycling goal, Indiana will need to divert, approximately, an additional 2.7 million tons of materials from the current waste stream. This is a significant endeavor that will take significant commitments to attain. In addition, there is no one element, program, or activity that can achieve this goal. Attainment of the 50% recycling goal and development of the circular economy will require a comprehensive statewide approach with support from elected officials, businesses, and residents of the State. Overall, this study confidently concludes that Indiana has an opportunity, as great as any state, to divert recycling commodities from the waste and build a circular economy.

## INTRODUCTION

The Recycling Market Development Program (RMDP) was established in early 1990s to improve management of solid waste by developing markets for recycling. The program is supported by the Recycling Promotion and Assistance Fund (RPAF) established under IC 4-23-5.5-14 [Funding is fifty percent of the Solid Waste Management Fee (IC 13-20-22-1), a fifty cents per ton solid waste fee assessed at final disposal facilities for MSW across the state]. The RMDP is administered by IDEM and operates under the Recycling Market Development Board (RMDB) as established by IC 4-23-5.5.

The mission of the program is to promote innovative projects to make Indiana a leader in recycling and waste reduction. In 2020, The RMDB issued grant funding to GT Environmental to conduct a statewide recycling and economic impact study (Study) for the State of Indiana.

This Study provides a detailed inventory of the current recycling collection and processing infrastructure and the role in providing end users materials for production. This Study also evaluates the economic impact of increases in recycling for the economic development, program development, and legislation necessary for a more sustainable solid waste system. This report is the culmination of a year-long study that focused on data collection for the collection and processing infrastructure and end user data collection.

The study's primary tasks were as follows:

- Inventory of Indiana's current municipal solid waste (MSW) and recycling infrastructure
- Assessment of the collection infrastructure needs and development opportunities associated with recycling
- Study of the economic impact of recycling collection, sorting, processing and end users in Indiana
- Data analysis and recommendations based on conclusions

**Part 1** of this study provides perspective for the current solid waste and recycling system in Indiana with maps that provide a visual representation of the location of recycling collection programs, organics processing, recycling processing, and solid waste disposal. Additional data is provided in the various tables that demonstrate solid waste infrastructure in Indiana. Most of the supporting data for this report was obtained from the various IDEM solid waste data collection systems. Some supplementary data was accumulated from surveys sent to solid waste districts, communities, and businesses. The survey process for this study used significant resources and resulted in additional data from solid waste districts and communities but provided limited data from private sector processors and end users.

When evaluating the economics of recycling, the full economic impact must be considered to fully understand the value to an economy rather than only costs incurred.





**Part 2** of the study uses the recycling tonnages from the IDEM 2019 Recycling Summary with additional data from the surveys as inputs to project the commodity value of recyclables on Indiana's economy. The model (IMPLAN) used for the projections is a common tool for such an analysis. IMPLAN calculates both direct and indirect economic impacts. Also, the tables in **Part 2** provide a perspective to the significant economic impact of recycling and the potential economic benefit to the economy resulting from increases in recycling.

**Part 3** of the study provides recommendations for the improvement in data collection, materials management planning, economic development, and recycling collection/processing. Included in the recommendations is a discussion of Indianapolis and Marion County current infrastructure.

The Study was conducted from June 2020 through May 2021 during the COVID-19 pandemic. The project was originally proposed with in-person meetings for stakeholders and the partners on the project. However, the pandemic caused the elimination of these in-person meetings, and the entire study was conducted utilizing various video platforms, emails, and phone calls. In addition, because the State of Indiana's solid waste system was significantly impacted by COVID-19 in 2020, the study used 2019 data which was mostly unaffected by the pandemic. While there is a general understanding that the pandemic impacted the project approach for outreach, request for data, and responses to surveys, it is difficult to determine the impact of COVID-19 on the Study. It is our opinion that the Study findings and recommendations are supported by the data collected and were not materially impacted by the pandemic.

"In 2019, Indiana's recycling rate was 19%. Overall, the destination of municipal solid waste was 76% to landfills, 5% to waste-to-energy, and 19% to recycling facilities. In 2014, Indiana legislators passed HEA 1183 establishing the State Recycling Goal (IC 13-20-25-1) of at least 50% of its municipal waste. Per definition, MSW originates from the operation of residential, municipal, commercial, or industrial establishments and community activities in the state. IC13-11-2-133 states: "Municipal waste means any garbage, refuse, industrial lunchroom or office waste, and other similar material resulting from the operation of residential, municipal, commercial, or industrial establishments and community activities." <sup>5</sup>

This Study provides an analysis of the solid waste and recycling infrastructure including tonnages of materials and the economic impact of recycling on the State of Indiana. This analysis, along with current solid waste trends and practices, was the basis for the recommendations at the end of this report. Achievement of at least a 50% recycling rate will require a significant commitment and a paradigm shift with respect to the costs of disposal versus cost of recycling. Indiana's low landfill gate rates are among the cheapest in the country and should not be singularly used to evaluate the short-term costs of recycling. Moreover, the landfill gate rates tend to be consistent, whereas recycling commodity prices can fluctuate significantly. These fluctuations in recycling commodities' prices when compared to the stable inexpensive landfill rates can make

---

<sup>5</sup> IDEM 2019 Recycling Activity Summary

the economics of recycling appear even more challenging. Managing solid waste and recycling requires a long-term vision and commitment requiring a holistic approach to the solid waste system.

## A. PROJECT PARTNERS

---

GT would like to thank our partners Indiana University-Purdue University Indianapolis (IUPUI) for the data collection and Indiana University/Indiana University Public Policy Institute for economic projections and analysis of the study.



IUPUI is Indiana's premier urban research university offering more than 550 undergraduate, graduate, and professional programs from Indiana University and Purdue University. GT requested the assistance and utilized 35 undergraduate and 7 graduate students to gather data on recycling.

For the survey data collection, the State of Indiana was divided up into seven regions. See **Map Intro-1**. Each region had a graduate student coordinating the region with the assistance of approximately 4-7 undergraduate students.

The students had three primary data collection sources:

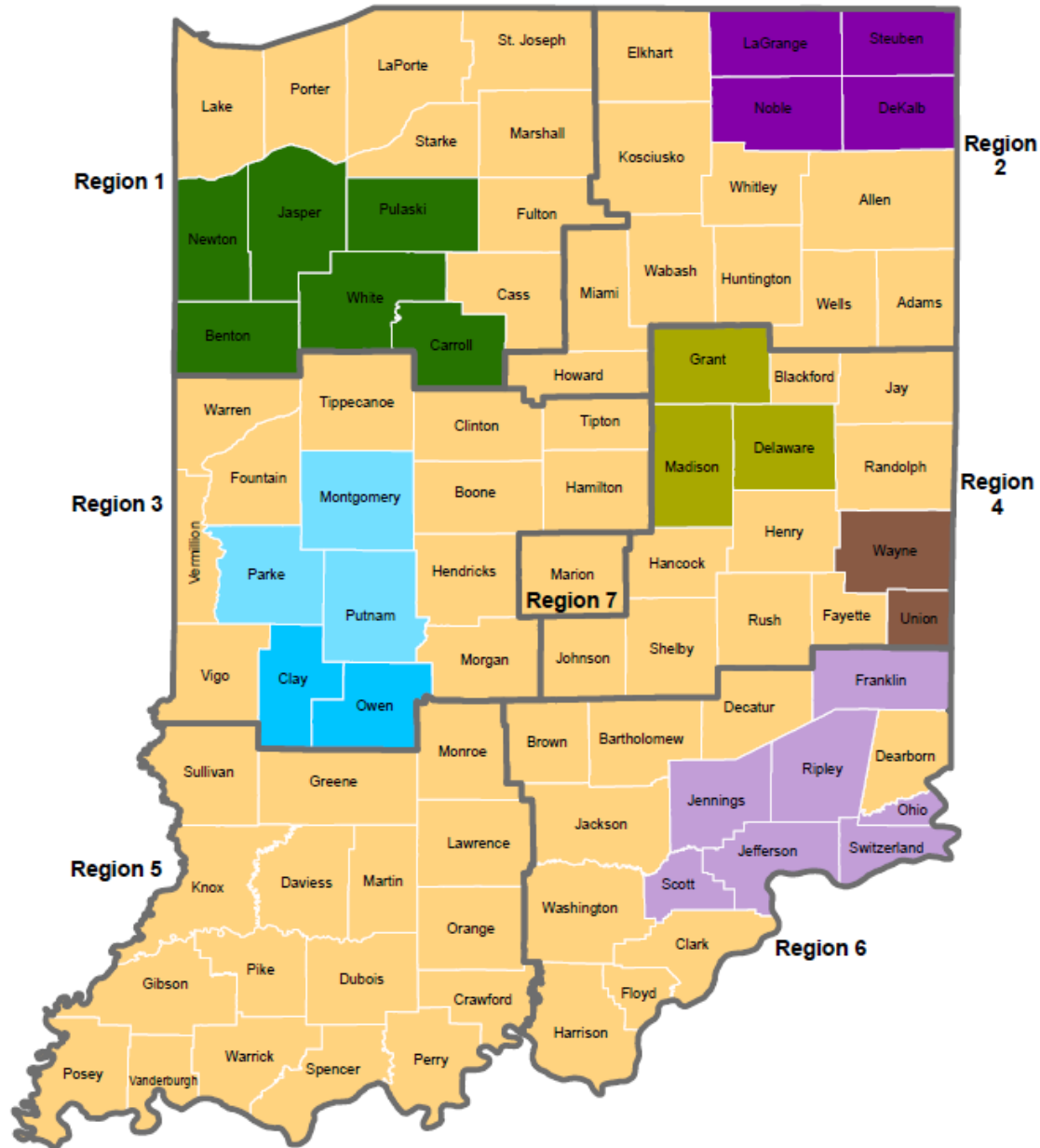
- Indiana solid waste districts
- Municipalities & towns
- End users

<https://www.iupui.edu/>



## Map Intro-1 Regions for Student Analysis

### Indiana Recycling Infrastructure & Economics Study Regions for Student Analysis



The Indiana University Public Policy Institute produces thoughtful, policy-related research, analysis, and guidance. Established in 1992, PPI is part of the IU School of Public and Environmental Affairs at IUPUI. The Indiana University



Public Policy Institute used the IMPLAN Model to provide data and analysis for the economic impact of recycling collection, sorting, and processing in the State of Indiana for this study.

<https://policyinstitute.iu.edu/>

### B. KEY STAKEHOLDERS

---

GT would like to extend thanks to key stakeholders who provided valuable insight and assisted with data collection for the study. GT met with key stakeholder groups and associations to communicate the objectives of the study and to obtain support for data collection.



The Association of Indiana Solid Waste Districts (AISWMD) has 70 members representing most of the solid waste districts in Indiana. AISWMD and its members are dedicated to the principles of responsible integrated solid waste management, ensuring a better today and tomorrow. The solid waste district members report recycling information to IDEM annually and had a high response rate for the study. For more information on AISWMD see link below.

<http://aiswmd.org/>



Accelerate Indiana Municipalities (AIM) is an advocate for Indiana municipalities and towns for the success of Hoosier municipalities as laboratories of innovation, hubs of talent, and the engines driving our state's economy. AIM provided assistance with surveys and data collection for municipalities. For more information on AIM see the following link.

<https://aimindiana.org/>



The mission of the Indiana Recycling Coalition (IRC) is to strengthen the circular economy in Indiana through waste reduction, reuse, recycling, and composting. IRC assisted in the data gathering, outreach, and provided valuable insight for the project. For more information on IRC see the following link.

<https://indianarecycling.org/>



Formed in 1901, the Indiana Manufacturers Association (IMA) is the second oldest manufacturers association in the country and the only trade association in Indiana that exclusively focuses on manufacturing. The Indiana Manufacturers Association is dedicated to advocating for a business climate that creates, protects, and promotes quality manufacturing jobs in Indiana. IMA provided assistance promoting the project to its members. For more information on IMA see the link below.

<https://www.indianamfg.com/>





IDEM and its staff has provided significant guidance and support for this study. IDEM's Solid Waste and Recycling Data Program has provided valuable data in the evaluation of the infrastructure and as an input for the economic evaluation as developed using the IMPLAN modeling software.

<https://www.in.gov/idem/>



The recycling partnership is a leading national nonprofit working toward a modernized US recycling system. The recycling partnership provided valuable guidance in the development and support for the study.

<https://recyclingpartnership.org/>

## C. METHODOLOGY

---

### IDEM's Solid Waste and Recycling Data Reporting Program

The State of Indiana currently has a comprehensive reporting process for solid waste, recycling, and compost facilities. IDEM requires solid waste landfills and transfer stations to report all solid waste disposed in the State of Indiana.

MSW disposal data in this Study is aggregated from IDEM Solid Waste Land Disposal Facility Reports for MSW originating from in-state sources and tonnages from the Indianapolis Resource Recovery facility. It does not include:

- Non-hazardous industrial process waste
- Construction and demolition (C&D) debris

Compost data is aggregated from Registered Composting Facility Reports representing the total estimated amount of waste including:

- Yard trimmings
- Food waste
- Other

Excluding

- Wood waste processed into mulch

Recycling data is aggregated from the IDEM Recycling Activity Reports. "Recycling (IC 13-20-25-6) is the recovery of recyclable materials from the MSW stream for use or reuse, conversion into raw materials, or for the use in the production of new products.

A recycler is defined as the owner or operator of a facility where recycling may occur, including a landfill, an incinerator, a material recovery facility (MRF), or a solid waste



management district. Recyclers submit a recycling report through IDEM's Solid Waste and Recycling Data Reporting Program, a web-based materials management system for aggregating data. Recyclers must report, in tons, the types of recycling material from Indiana origins that it ships to in-state recycling facilities, in state manufacturers/end users, or out-of-state destinations.”<sup>6</sup>

The 2019 data provided by IDEM's solid waste and recycling data collection system was utilized in all aspects of the Study. For more information on Indiana Department of Environmental Management 2019 Recycling Activity Summary see the link below.

<https://www.in.gov/idem/recycle/recycling-activity-reporting/>

## Surveying

In addition to IDEM's solid waste and recycling reporting data, supplemental data was requested from various stakeholders. The Study included surveys to various stakeholders to identify recycling infrastructure and obtain economic data on recycling collection, recycling processing, and recycling use in manufacturing. Surveys also provide qualitative data from companies with respect to expansion plans using Indiana recyclables as feedstock as inputs.

See **Appendix A** for a copy of the surveys sent to Indiana solid waste districts.

See **Appendix B** for an example of the surveys sent to the municipalities.

See **Appendix C** for an example of an email sent to AIM Contacts.

See **Appendix D** for an example of surveys sent to the end users and manufacturers.

## IMPLAN Modeling

The IMPLAN Model was used for this Study to provide data and analysis for the economic impact of recycling collection, sorting, and processing in the State of Indiana. IMPLAN (short for “impact analysis for planning”) is an advanced analysis tool developed by the U.S. government for gathering and reporting economic data.

The IMPLAN model used in this analysis is one of the two most commonly used input-output models in these types of analyses. It was built by the Bureau of Labor Statistics and based on business-to-business and consumer spending.

---

<sup>6</sup> IDEM 2019 Recycling Activity Summary



## PART 1. CURRENT WASTE AND RECYCLING INFRASTRUCTURE

Reporting data on solid waste and recycling can be mandated or can be obtained through self-reporting or survey data. Reporting of solid waste tonnages is a key component of a fee collection system. Currently, IDEM requires solid waste landfills and transfer facilities to report tonnages received for disposal and collects fees based on the tonnages. In addition, IDEM has a comprehensive reporting system for aggregating recycling tonnages utilizing the Re-TRAC system for solid waste districts and recycling processors to report tons of recycling collected and processed. The IDEM solid waste reports were one source of data for infrastructure identification.

Additional sources of recycling infrastructure and tonnage data were obtained from surveys sent to solid waste districts, Indiana communities, recycling processors, and end users of recycling feedstock.

### A. GENERAL LOCATIONS AND DEFINITIONS

---

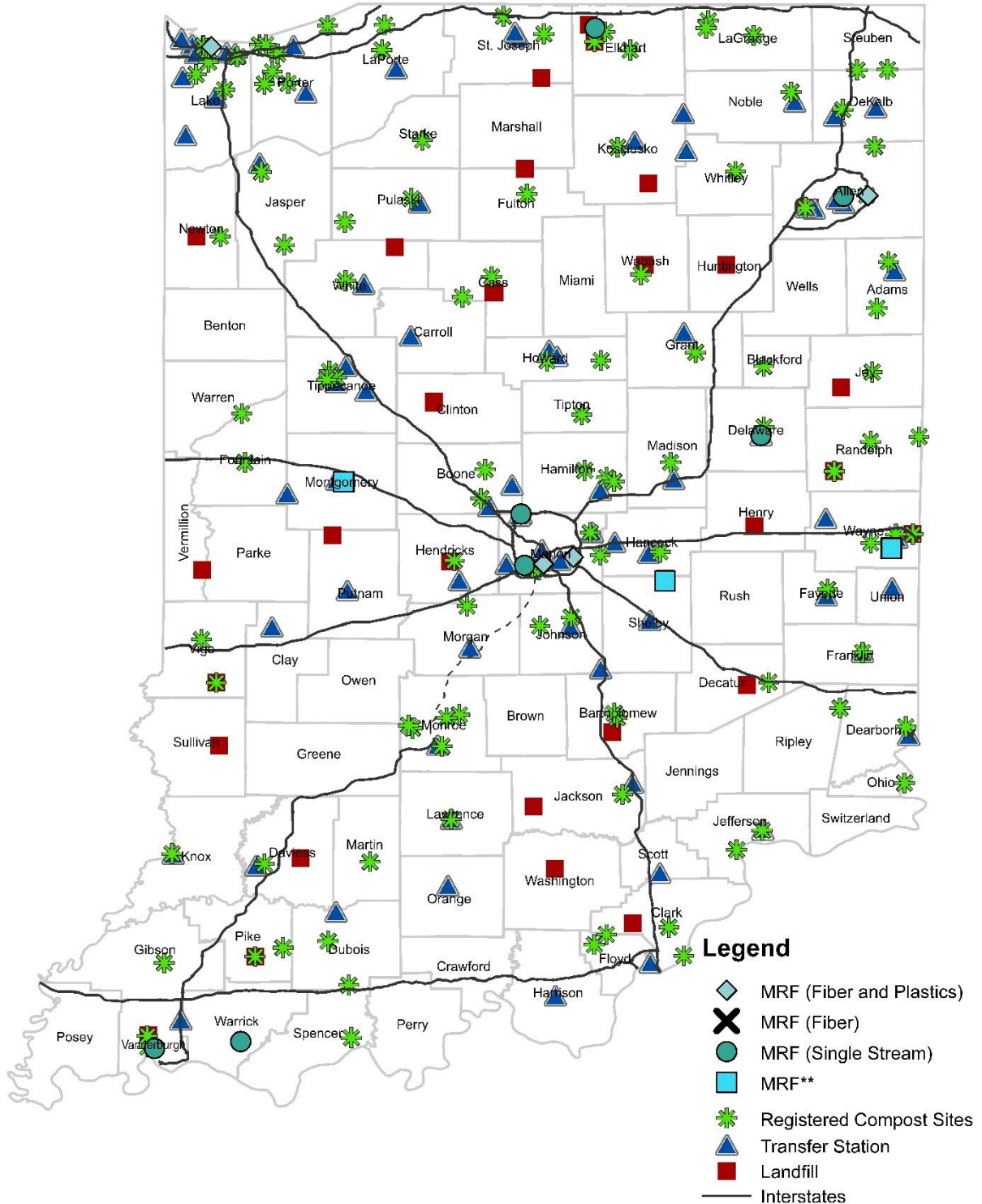
#### Materials Management Facilities - Locations

- Landfills: 34
- Transfer Stations: 78
- Compost Facilities: 116
- MRFs: 14

The following map, **Map 1A-1**, presents landfills, transfer stations, compost facilities, and MRFs.

**Map 1A-1 2019 Materials Management Facilities (Landfills, Transfer Stations, Compost, and MRF)**

**2019 Materials Management Facilities  
(Landfills, Transfer Stations, Compost, and MRF)**



\*\*Non-specified MRF type but reported more than one type of material.

## Types of Waste Definitions

**Municipal solid waste (MSW)** includes all items from homes and businesses that people no longer have any use for. These wastes are commonly called trash or garbage and include items such as food, paper, plastics, textiles, leather, wood, glass, metals, sanitary waste in septic tanks, and other wastes. MSW is usually left on the curbside weekly and picked up by a dump truck and taken to a landfill to be buried in a landfill or burned in an incinerator. Municipal solid waste (MSW) is defined in 329 IAC 10-2-115. MSW does not include Construction/Demolition Waste, Industrial Process Waste, Infectious Waste, Coal Combustion Residual (CCR) Waste, Hazardous Waste, and Pollution Control Waste. However, a MSW landfill can accept non-hazardous non-MSW waste.

**Non-Municipal solid waste (NMSW)** includes Waste that is not created by community activities or residential/commercial establishments are non-municipal solid waste. This could also include solid waste generated by industries.

**Construction/Demolition Debris** typically includes waste like scrap lumber, drywall, roofing materials, non-asbestos insulation, bricks, concrete, glass, plumbing, and electrical fixtures.

**Industrial Solid Waste** includes industrial process wastes and pollution control wastes generated by manufacturing or industrial processes that are not hazardous wastes, such as CCR and foundry wastes. A waste classification is needed to dispose this waste in a restricted waste landfill. Based on the constituents' concentrations, IDEM assigns one of 4 classes (Type I, Type II, Type III and Type IV). Restricted waste site criteria are specified in 329 IAC 10-9-4.

**Infectious Waste** is not a municipal solid waste. Infectious waste is defined by the Indiana Department of Health (IDOH) rules (410 IAC 1-3-10) and Indiana code IC 16-41-16-4 as waste capable of transmitting a dangerous communicable disease.

**Other** includes NMSW not classified as C/D, foundry, coal ash, or flue gas desulfurization (FGD) can be taken to processing facilities, resource recovery facilities, and landfills. This includes manufacturing process wastes, resins, oxides, non-coal combustion sludge, asbestos-containing waste, pollution control/spill cleanup waste, mining wastes, incinerator residues, low level PCB waste, and railroad ties.

## Types of Materials Management Facilities

The following facility types received MSW which reported to IDEM:

### Municipal Solid Waste Landfill (MSWLFs)

Trash from homes and businesses, construction and demolition debris, and most non-hazardous industrial wastes are disposed of in MSWLFs. [329 IAC 10-9-2](#) provides waste criteria for solid waste that can and cannot be accepted at a MSWLF.

These landfills must not accept:

- Hazardous waste (except household hazardous waste and conditionally exempt small quantity waste)
- Certain polychlorinated biphenyl (PCB) waste
- Untreated infectious waste
- Vegetative matter, unless from homes or properly bagged
- Whole waste tires
- Lead acid batteries and mercury switches
- Regulated asbestos-containing material not managed in accordance with Air rules [326 IAC 14-10](#) and [329 IAC 10-8.2-4](#)
- Appliances or motor vehicle air conditioner containing a refrigerant or other class I or Class II substance that has not been removed as required by [40 CFR 82.156](#)
- Biosolids as defined in [327 IAC 6.1-2-7](#) that is not managed in accordance with [327 IAC 6.1-1-7](#)
- Wastewater as defined in the [327 IAC 7.1-2-41](#) that is not managed in accordance with [327 IAC 7.1-7-1](#)

MSWLFs must also have methane gas extraction/control system and storm water pollution controls. Requirements specific to these landfills are provided in [329 IAC 10-15 through 329 IAC 23](#).

For more information see the link below.

<https://www.in.gov/idem/waste/waste-industries/landfills/>

### Transfer Station

Facilities at which solid waste is transferred from a vehicle or container to another vehicle or container for transportation purposes to facilities for disposal and/or recycling. Baling or shredding for the purposes of transportation may occur at a transfer station. Transfer Station is defined in [IC 13-11-2-235](#), [329 IAC 11-2-47](#), and has a [fact sheet](#) for further information.

In addition to receiving solid waste for disposal, some of these facilities have separate bay areas for consolidating single stream recyclables for sending to in-state or out-of-state MRF's. They may also provide hub and spoke services for source-separated recyclables and/or operate single sort lines such as for old, corrugated cardboard (OCC).

### Solidification Facility

A solidification facility combines wet/liquid wastes with materials or other waste to make the waste pass the paint filter (liquid) test and suitable for landfilling. Solid waste solidification facilities located at operating, permitted landfills are permitted under the landfill permit.

### Medical Waste Processor

Infectious waste processors effectively treat infectious waste so it can be safely disposed of. Effective treatment of infectious waste is defined in IC 16-41-16-3 and it occurs when the pathogenic qualities of infectious waste is reduced to a point where the waste is safe to handle. The effective treatments include incineration, steam sterilization, chemical disinfection, thermal inactivation, or irradiation.

### Solid Waste Incinerator (Reported tonnage at $\geq 10$ Tons/Day)

An incinerator is engineered equipment designed to burn solid waste under the effect of controls of temperature, retention time, air, and other combustion factors. In Indiana, incinerators are categorized and regulated as either solid waste incinerators, infectious waste incinerators, or hazardous waste incinerators. Although solid waste and infectious waste incinerators are permitted and regulated under the category of solid waste processing facilities, they are considered to be final disposal facilities for planning and disposal fee purposes, as evident in statutory language.

For more information see the link below.

<https://www.in.gov/idem/waste/waste-industries/solid-waste-processing-facilities/>

### Material Recovery Facility (MRF)

MRFs generally accept and process recyclables from residential, business, or industrial sources. Processors typically sort materials by type and grade, and then bale, shred, or granulate them to create a marketable intermediate product. These buyers sell to brokers or end-use markets.

### Compost Site

A solid waste compost facility in this context manages the decomposition of non-vegetative and non-organic solid waste. However, this is uncommon. Indiana has a landfill ban on vegetative waste disposal and so, a separate registration program exists for vegetative and organic material composting facilities.

### Community Recycling Hub

For this study, a Community Recycling Hub refers to a type of drop-off that includes baling, branch drop-offs, and/or other forms of recyclables collection consolidation. These are typically managed by solid waste management districts, communities, or institutions. These hubs submitted tonnage information to IDEM.

## B. DISPOSAL INFRASTRUCTURE

---

***The remainder of this study focuses on municipal solid waste tonnages from in-state origins and analysis does not include other categories above such as other non-municipal, construction/demolition, and other waste tonnages.***

Table 1B-1 2019 Municipal Solid Waste Tonnages Managed

Origin County	Transfer Station	Municipal Solid Waste Landfill*	Solidification Facility	Medical Waste Processor	Solid Waste Incinerator >= 10 Tons/Day
Marion	594,211	1,022,305	53	100	366,311
Lake	541,101	637,292	2	720	0
Allen	65,948	368,178	1	329	87
Hamilton	255,240	114,094	155	53	2,397
Porter	173,832	190,743	0	126	10
Tippecanoe	139,979	212,596	29	3	310
Elkhart	107	350,561	29	127	4
St Joseph	141,852	206,571	4	329	11
Vanderburgh	71,202	272,486	8	4	0
Hendricks	92,229	174,453	3	25	38,964
Madison	146,497	150,353	21	0	362
Monroe	99,816	150,439	3	9	78
Delaware	98,161	148,309	0	2	1,237
Johnson	90,186	138,220	158	20	8,790
Boone	72,828	144,542	102	114	2,341
Hancock	21,209	128,523	1,010	34	1,407
La Porte	82,372	49,165	4	86	0
Noble	36,953	87,501	0	13	8
Clark	11,067	112,288	1	2	0
Howard	43,828	74,661	1,460	1	11
Vigo	21,057	82,762	5	14	0
Wayne	1,327	97,045	0	1	0
Jackson	21,636	71,825	0	0	158
Bartholomew	5,317	79,335	2	4	2,162
Kosciusko	20,733	62,868	0	40	0
Clay	17,954	61,397	1	0	7
Knox	34,380	40,783	4	14	0
Lawrence	26,162	35,123	1	0	8
Montgomery	18,853	40,721	230	1	81
Floyd	7,311	47,741	1	1	0
Putnam	24,160	29,004	0	39	632
Grant	10,397	43,038	0	70	0
Morgan	12,172	21,626	11,549	4	7,512
Shelby	6,602	43,618	741	29	32
De Kalb	25,868	22,515	0	26	0
Marshall	685	47,148	0	31	226
Dubois	2	45,461	0	1	346
Posey	6,618	37,903	0	0	0
Henry	143	43,869	269	17	91
Whitley	11,683	27,221	2	0	0
Warrick	35,614	3,020	0	5	0
Clinton	3,316	32,819	28	0	30
Adams	8,854	26,172	0	8	0
Orange	14,783	19,699	2	1	0
Decatur	89	30,264	0	0	2
White	2,913	27,180	0	0	30
Scott	7,601	20,976	0	0	129
Fayette	8,660	18,495	3	0	5





Origin County	Transfer Station	Municipal Solid Waste Landfill*	Solidification Facility	Medical Waste Processor	Solid Waste Incinerator >= 10 Tons/Day
Cass	2,721	23,983	0	29	0
Wabash	4,411	22,180	0	4	0
Jasper	16,574	9,819	2	5	5
Jefferson	8,220	17,348	2	1	1
Huntington	3,083	19,710	611	8	10
Gibson	1,369	21,177	9	0	0
Randolph	248	21,570	0	1	0
Jennings	9,853	11,148	314	0	8
Daviess	782	20,497	3	0	7
Lagrange	10,734	9,280	0	1	132
Steuben	14,405	4,030	0	2	7
Miami	2,049	16,162	0	17	16
Blackford	5,792	11,715	0	0	0
Jay	3,102	14,270	0	0	0
Dearborn	9,756	6,456	2	0	0
Greene	7,726	7,864	2	0	6
Wells	287	14,903	0	14	0
Franklin	10,249	3,860	0	0	343
Newton	4,801	8,890	0	0	10
Rush	0	13,626	0	3	0
Washington	3	13,167	0	0	0
Owen	12,823	88	0	0	89
Sullivan	2,927	9,029	0	0	0
Tipton	8,104	2,589	1	0	107
Fulton	136	9,836	0	0	0
Ripley	36	9,838	3	0	0
Brown	5,565	4,185	1	0	0
Pulaski	1,732	7,073	0	0	0
Parke	7,979	475	0	0	0
Martin	5,981	1,203	0	0	21
Spencer	12	6,980	0	0	0
Pike	60	6,535	0	0	0
Vermillion	4,057	2,396	0	0	0
Starke	1,906	3,820	0	6	9
Carroll	1,784	3,527	0	1	7
Fountain	5,212	0	0	0	0
Perry	0	4,247	0	0	0
Harrison	908	3,093	4	1	41
Switzerland	1,543	2,136	0	0	0
Crawford	0	2,642	0	0	0
Benton	1,218	776	0	0	0
Warren	1,647	0	0	0	0
Union	211	1,374	0	0	0
Ohio	45	147	0	0	181
<b>Total</b>	<b>3,313,562</b>	<b>6,266,549</b>	<b>16,835</b>	<b>2,496</b>	<b>434,779</b>

\*Some of these tons may have been managed by multiple types of facilities and included in multiple columns; the table represents what each type of facility managed.

Though this report focuses on MSW, MSW landfills do accept non-MSW, CDD, and other types of waste. **Table 1B-2** below demonstrates this concept.

Table 1B-2 Waste Disposal Tonnages Reported Sent to MSW Landfills

Origin County	Municipal Solid Waste	Other Non-Municipal	Construction/ Demolition	Other*	Total
Marion	1,022,305	459,670	172,604	137,292	1,791,871
Lake	637,292	348,049	99	42,658	1,028,098
Allen	368,178	46,597	67,422	74,283	556,480
Elkhart	350,561	18,973	57,324	63,323	490,180
Vanderburgh	272,486	93,517	7,756	2,998	376,758
Tippecanoe	212,596	36,229	964	2,677	252,466
St Joseph	206,571	23,175	9,289	10,199	249,234
Porter	190,743	207,431	599	18,827	417,601
Hendricks	174,453	32,543	4,200	4,522	215,719
Monroe	150,439	42,697	5,084	779	198,999
Madison	150,353	26,534	1,145	3,365	181,397
Delaware	148,309	31,401	3,175	541	183,426
Boone	144,542	6,769	11,746	112	163,169
Johnson	138,220	15,748	731	8,492	163,190
Hancock	128,523	3,869	7,133	3,375	142,901
Hamilton	114,094	27,414	7,499	3,040	152,047
Clark	112,288	877	30,037	0	143,202
Wayne	97,045	2,909	10,939	1,910	112,803
Noble	87,501	16,571	3,977	4,954	113,003
Vigo	82,762	19,254	15,754	66,163	183,934
Bartholomew	79,335	8,446	8,123	1,221	97,126
Howard	74,661	46,835	6,497	6,924	134,917
Jackson	71,825	9,638	1,170	32	82,665
Kosciusko	62,868	12,781	16,514	52,534	144,697
Clay	61,397	4,262	472	235	66,365
La Porte	49,165	20,385	298	62,666	132,514
Floyd	47,741	98	8,624	0	56,463
Marshall	47,148	12,806	5,226	11,635	76,816
Dubois	45,461	3,065	2,777	609	51,912
Henry	43,869	4,876	2,765	42,453	93,964
Shelby	43,618	7,501	3,027	63,088	117,234
Grant	43,038	27,202	12,877	4,453	87,570
Knox	40,783	5,765	7,275	293	54,117
Montgomery	40,721	24,108	35	2,207	67,072
Posey	37,903	38,329	17,081	3,368	96,681
Lawrence	35,123	15,725	2,129	1,227	54,205
Clinton	32,819	8,269	1,144	1,227	43,459
Decatur	30,264	1,011	635	0	31,910
Putnam	29,004	4,654	88	1	33,747
Whitley	27,221	12,539	7,120	17,227	64,107
White	27,180	1,011	284	538	29,014
Adams	26,172	3,704	3,744	50	33,670
Cass	23,983	14,695	8,900	6,875	54,453
De Kalb	22,515	111,635	475	40,986	175,612
Wabash	22,180	139,661	6,334	28,036	196,210
Morgan	21,626	6,214	5,427	0	33,267
Randolph	21,570	1,773	240	736	24,319
Gibson	21,177	3,546	4,117	70	28,911
Scott	20,976	5,649	4,523	0	31,149



Origin County	Municipal Solid Waste	Other Non-Municipal	Construction/ Demolition	Other*	Total
Daviess	20,497	10,314	3,668	8,507	42,986
Huntington	19,710	9,575	4,772	18,514	52,571
Orange	19,699	462	1,736	0	21,896
Fayette	18,495	1,873	1,063	77	21,509
Jefferson	17,348	1,583	1,992	0	20,923
Miami	16,162	2,911	2,114	503	21,690
Wells	14,903	4,231	1,175	908	21,216
Jay	14,270	8,024	360	415	23,069
Rush	13,626	498	1,599	33,892	49,614
Washington	13,167	1,962	5,794	0	20,922
Blackford	11,715	6,026	1,029	11,481	30,251
Jennings	11,148	9,609	148	0	20,905
Ripley	9,838	1,303	186	0	11,328
Fulton	9,836	12,116	3,966	40,228	66,146
Jasper	9,819	7,801	495	5,614	23,730
Lagrange	9,280	661	337	3	10,281
Sullivan	9,029	1,807	4,322	2,603	17,761
Newton	8,890	6,482	1,292	3,897	20,561
Greene	7,864	284	2,490	7	10,645
Pulaski	7,073	214	299	0	7,586
Spencer	6,980	12,042	492	736	20,250
Pike	6,535	10,114	972	77	17,698
Dearborn	6,456	260	18	1,348	8,082
Perry	4,247	13,162	79	44,150	61,638
Brown	4,185	686	103	0	4,974
Steuben	4,030	245	1,883	113	6,271
Franklin	3,860	1,641	336	0	5,837
Starke	3,820	1,440	1,311	0	6,571
Carroll	3,527	244	86	0	3,857
Harrison	3,093	54	5,804	0	8,952
Warrick	3,020	18,460	903	2,755	25,137
Crawford	2,642	848	1,268	521	5,278
Tipton	2,589	4,049	516	163	7,318
Vermillion	2,396	15,834	1,068	4	19,302
Switzerland	2,136	849	4	0	2,989
Union	1,374	272	389	3	2,039
Martin	1,203	1,091	477	998	3,769
Benton	776	497	38	47	1,358
Parke	475	92	114	0	682
Ohio	147	0	0	0	147
Owen	88	202	125	755	1,169
Fountain	0	414	0	0	414
Warren	0	101	0	0	101
<b>Total</b>	<b>6,266,549</b>	<b>2,186,744</b>	<b>610,226</b>	<b>976,522</b>	<b>10,040,041</b>

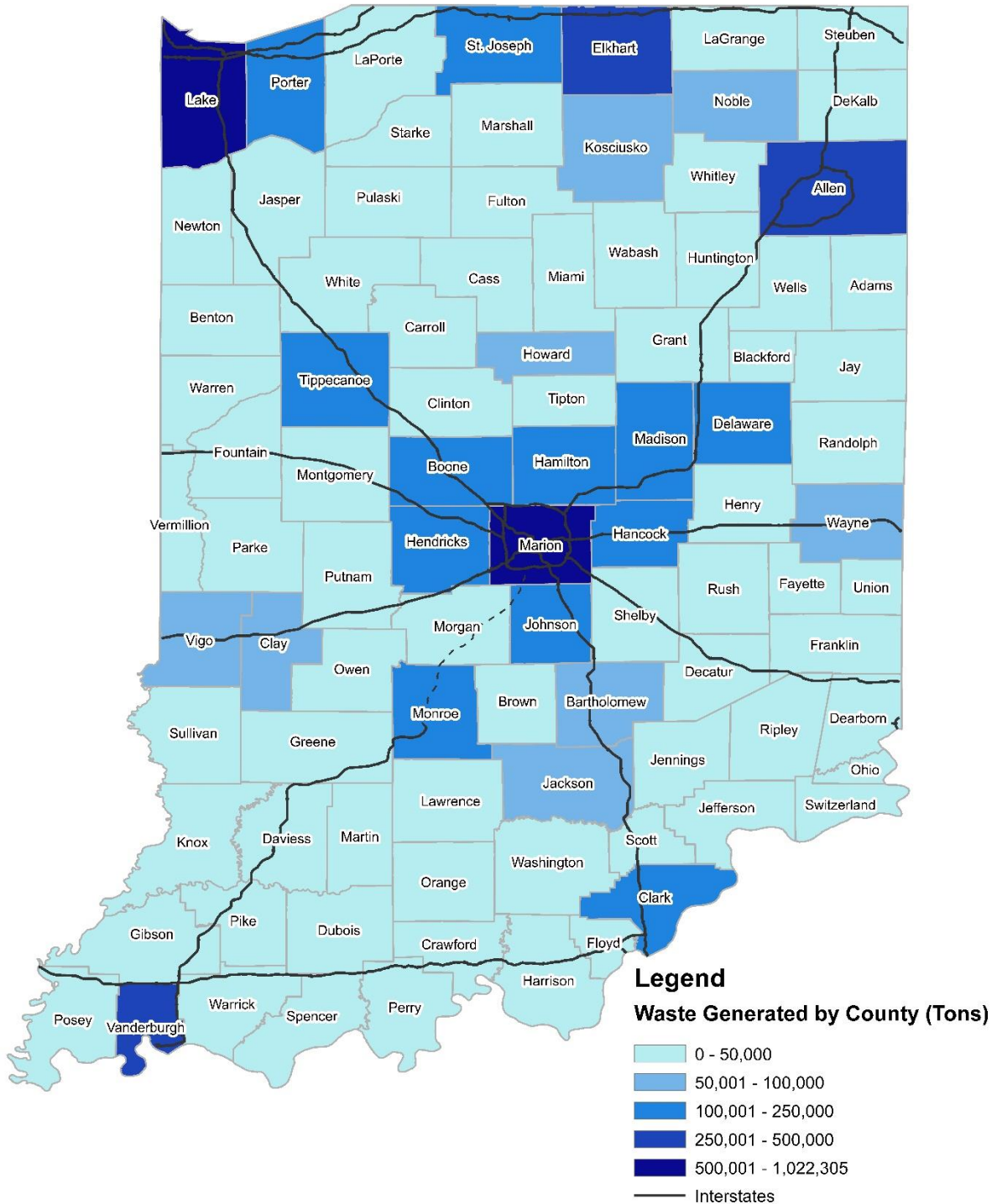
\*Other includes tonnages reported for foundry, coal ash, flue gas desulfurization waste, and alternate daily cover/reuse.

For **Map 1B-1**, municipal wastes were used from 2019 to show the generation by county. Total Waste includes tonnages reported by landfill, transfer station, solidification

facilities, medical waste processors, and incinerators as listed in the “Total Waste Generated” column above.

### Map 1B-1 2019 Waste Landfilled by Origin County

2019 Reported Landfill Municipal Solid Waste Generated by County in Indiana



The following, **Tables 1B-3 and 1B-4**, are an inventory of the MSW landfills and transfer stations registered in Indiana:

**Table 1B-3 Registered MSW Landfills**

County of Landfill	Facility Name	MSW Tons
Allen	National Serv-All Landfill	419,254
Allen	United Refuse Landfill	-
Bartholomew	Bartholomew County Landfill II	71,501
Cass	Oak Ridge Recycling & Disposal Facility	95,303
Clark	Clark Floyd Landfill	171,708
Clinton	Walnut Creek Landfill	451,480
Daviess	Daviess County Landfill	19,891
Decatur	Decatur Hills Landfill	115,743
Elkhart	Earthmovers Landfill	186,580
Elkhart	Elkhart County Landfill	176,870
Fulton	County Line Landfill	308,236
Hendricks	Twin Bridges Recycling & Disposal Facility	522,131
Henry	Hayes Landfill	59,678
Huntington	Huntington City Landfill	747
Jackson	Medora Sanitary Landfill	134,908
Jay	Jay County Landfill	47,339
Kosciusko	Hoosier Landfill 2	161,422
Marion	South Side Landfill	838,661
Newton	Newton County Landfill	380,622
Pike	Advanced Disposal Services Blackfoot Landfill	238,830
Putnam	Heritage Landfill MSW	-
Randolph	Randolph Farms Landfill	355,225
Shelby	Caldwell Landfill	164,500
St. Joseph	Prairie View Recycling & Disposal Facility	254,864
Sullivan	Sullivan County Landfill	-
Vanderburgh	Laubscher Meadows Landfill	166,862
Vermillion	West Clinton Landfill	-
Vigo	Sycamore Ridge Landfill	387,413
Wabash	Wabash Valley Landfill	143,544
Washington	Washington County Landfill	7,167
Wayne	New Paris Pike Landfill	73,337
White	Liberty Landfill	312,733

Table 1B-4 Registered Transfer Stations

County of Transfer Station	Facility Name	MSW Tons
Adams	Adams County Solid Waste Mgmt Dist Processing Facility	8,523
Adams	Advanced Disposal Recycling Center & Transfer	62,558
Adams	Bunn Box Inc.	7,351
Adams	Washler Inc Recycling and Transfer Station	9,211
Allen	Warsaw Transfer Station	21,561
Allen	Stericycle Environmental Solutions Inc	177
Allen	Kendallville Iron and Metal Transfer Station	79,326
Bartholomew	Jackson County Transfer and Recycling Station	40,313
Bartholomew	Franklin Transfer Station	89,224
Bartholomew	Edinburgh Transfer Station	637
Benton	Waste Management of Lafayette Wabash Ave Transfer Station	92,638
Blackford	East Central Recycling Transfer Station	104,656
Boone	Boone County Resource Recovery Systems Transfer Station	5,694
Boone	334 Recycling and Transfer Station	159,567
Boone	96TH Street Transfer Station	240,068
Boone	Rock Hampton Waste & Recycling Transfer Station	58,800
Brown	Hoosier Disposal & Recycling	121,595
Carroll	Carroll County Transfer Station	554
Carroll	Tippecanoe County Transfer and Recycling Station	58,624
Carroll	White County Transfer Facility	137
Cass	Davis Road Transfer Station	54,127
Clark	Bi Co Transfer Station	19,422
Clay	Wallace Transfer & Recycling LLC	52,164
Clay	RHS Recycling and Transfer Station	24,700
Clinton	Crawfordsville Transfer Station	8,951
Daviess	Vincennes Transfer Station	37,322
Dearborn	Dearborn County Trash and Recycling Transfer Station	11,322
Delaware	Hamilton County Transfer Station	109,701
Elkhart	South Bend Resource Recovery and Transfer	893
Fayette	Connersville Transfer Station	8,660
Fountain	T & S Transfer and Recycling	16,767
Franklin	Franklin County Transfer Station	10,244
Gibson	Advanced Disposal Services Solid Waste Midwest, LLC	114,825
Grant	Marion Utility Transfer Station	9,973
Greene	Lawrence County SWMD Transfer Station	26,291
Hamilton	Mt Comfort Transfer Station	63,120
Hamilton	Madison Avenue Transfer Station	134,988





County of Transfer Station	Facility Name	MSW Tons
Hamilton	Rays East Recycling and Transfer Facility	92,333
Hancock	Republic Services Greenfield Transfer Station	8,831
Hancock	Circle City Recycling & Transfer Station	149,982
Hancock	White River Recycling and Transfer	120,956
Hendricks	Rays Resource Recovery & Transfer Station	66,055
Jasper	Illiana Transfer 3	109,718
Jasper	Waste Management of Northwest Indiana Transfer Station	170,593
Jasper	Lowell Transfer Station	34,786
Jasper	Blaine Street Partners LLC Transfer Station	75,583
Jasper	Valparaiso Transfer Station	97,564
Jefferson	Madison City Transfer Station	5,232
La Porte	Waste Management of LaPorte Transfer Station	47,766
La Porte	Able Disposal Recycling & Transfer Station	71,824
Lake	Illiana Transfer 1	57,564
Lake	Illiana Transfer 2	73,810
Lake	Illiana Transfer 4	81,356
Morgan	Martinsville Transfer Station	7,171
Orange	Wolfe Transfer Station	14,753
Pulaski	Pulaski County Transfer Station	1,332
Scott	Scott County Transfer Station	1,622
Scott	Scottsburg Transfer Station	4,929
Shelby	Shelby County Transfer Station	1,917
St Joseph	Green Tech Transfer & Recycling	140,774
Union	Union County Transfer Station	211
Wayne	Wayne County Transfer Station	1,261
Whitley	Sweetheimer Transfer Station	10,957

## C. RECYCLING

### MRF-Sheds

MRFs provide a facility for recyclables to be processing and baled/prepared for shipment to a broker or end user. Some MRFs focus on few materials while others collect through single-stream services such as curbside or drop-off recycling programs. Materials collected by the commercial sector may also go through a MRF if they are not baled on site to be directly shipped to a processor/end user. MRF capacity was not reported to IDEM. **Table 1C-1** shows the 14 material recovery facilities (MRFs) which reported tonnage to IDEM for shipments of recyclables from in-state origins.

Table 1C-1 2019 MRF Tonnage

County	Registration Name	Recycling Infrastructure Type	2019 Tons
Allen	Quincy Recycle - New Haven	MRF (Fiber and Plastics)	55,167
Allen	Serv-All Recycling	MRF (Single Stream)	24,488
Delaware	East Central Recycling Transfer Station	MRF (Single Stream)	9,058
Elkhart	Recycling Works, Inc.	MRF (Single Stream)	69,838
Lake	Pratt Recycling Midwest Region - Gary	MRF (Fiber and Plastics)	71,000
Marion	Republic – 96 Street MRF*	MRF (Single Stream)	41,522
Marion	Quincy Recycle - Indianapolis	MRF (Fiber and Plastics)	25,176
Marion	Ray's Indianapolis Recycling	MRF (Single Stream)	42,576
Marion	WestRock	MRF (Fiber and Plastics)	67,116
Montgomery	W Enterprises LLC	MRF**	10,320
Shelby	CGS Services, Inc.	MRF**	6,056
Vanderburgh	Tri-State Resource Recovery Facility	MRF (Single Stream)	29,919
Warrick	Warrick County Recycling & Resource Management District	MRF (Single Stream)	1,395
Wayne	Richmond Sanitation Dept / MRF	MRF**	478

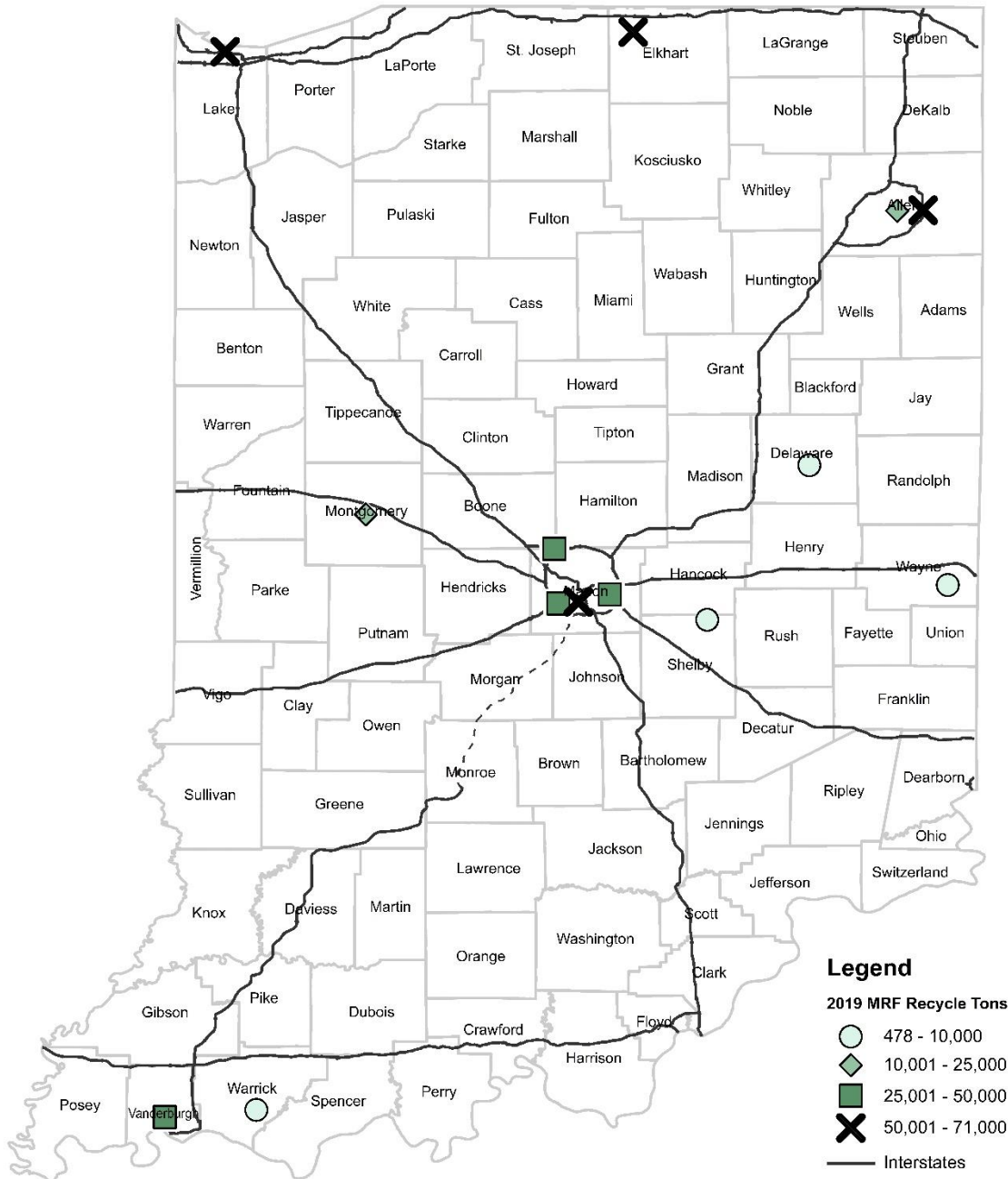
\*Changed reporting number from transfer station to material recovery facility.

\*\*Non-specified MRF type but reported more than one type of material.

MRFs were mapped (**Map 1C-1**) with different symbols representing the recyclable tonnages that each facility processed for a comparative visual of each MRFs processed materials.

## Map 1C-1 2019 Reported Processed Tons by Material Recovery Facilities (MRF) in Indiana

2019 Reported Processed Tons by Material Recovery Facilities in Indiana



Shown on the map, there are not many MRFs (known/reported) which provide processing for recyclables in Indiana. The lack of processing facilities can make it difficult for recyclables to economically be collected. Transfer stations which collect, transfer, and sometimes bale materials aids Indiana's access to material processing.

Large tonnages of recyclables that come from Indiana are from sole-source MRFs/collection and not the traditional, single stream curbside model.

**Table 1C-2** shows the 30 transfer stations which received and shipped recyclables as pass-through to MRFs, brokers, or end users and reported tonnage to IDEM.

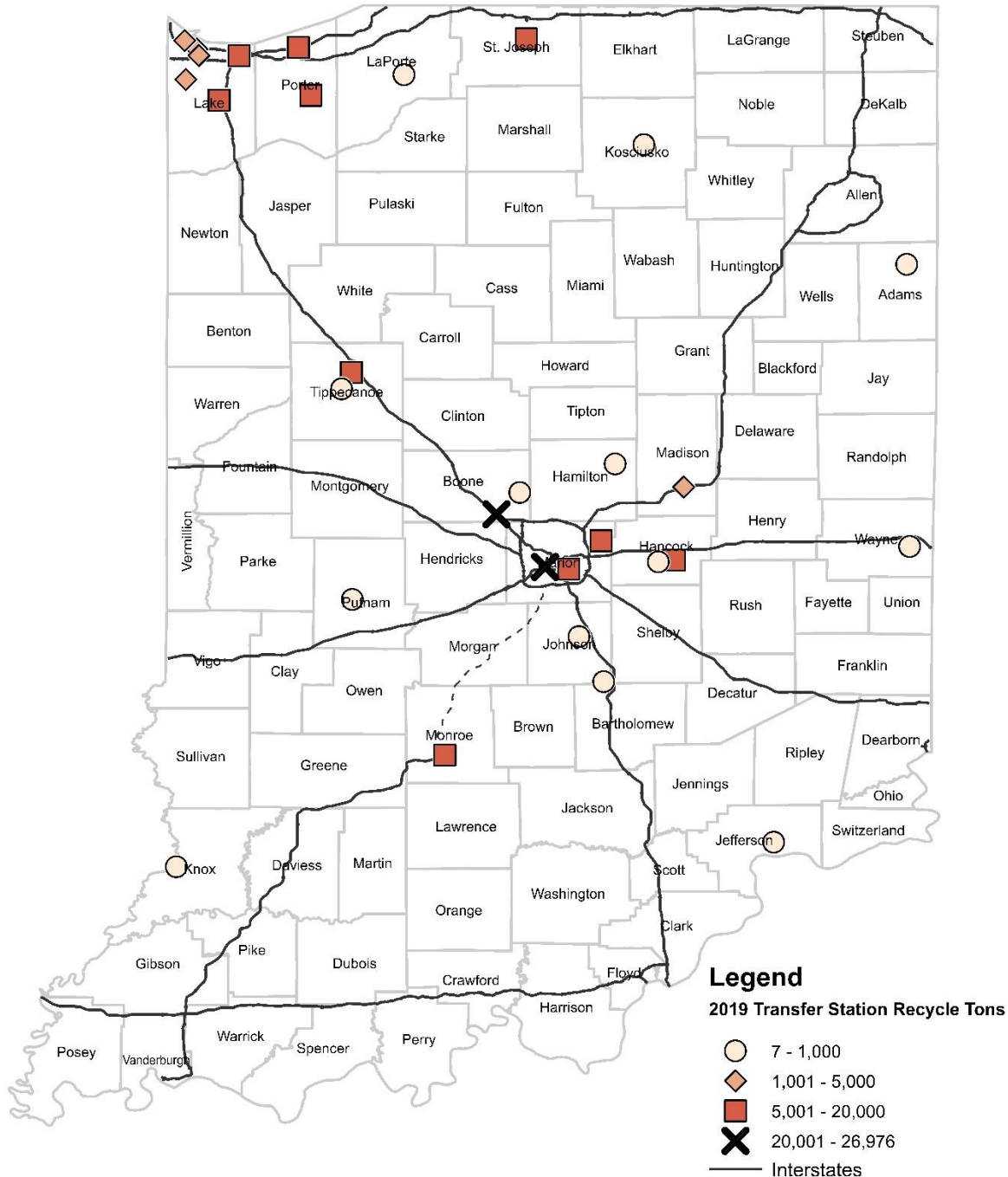
**Table 1C-2 2019 Transfer Stations with Shipments of Recyclables Reported Recycling Tonnage**

County Location	Registration Name	Transfer Station Recycling Materials Focus	2019 Recycling Tons
Hendricks	334 Recycling & Transfer Station	Single Stream, Fiber, Metals	26,976
Porter	Able Disposal Recycling & Transfer Station	Single Stream	14,394
Adams	Adams County Solid Waste Management District Processing Facility	Paper, Plastic, and Metals	732
Lake	Blaine Street Partners LLC Transfer Station	Fiber, Metals	2,687
Boone	Boone County Resource Recovery Systems Transfer Station	Fiber	12
Marion	Circle City Recycling & Transfer Station	Fiber	15,171
Jefferson	City of Madison Transfer Station	Single Stream	691
Johnson	Edinburgh Transfer Station	TS (Metals	7
Johnson	Franklin Transfer Station	Single Stream	832
St Joseph	Green Tech Transfer & Recycling	Fiber	5,751
Hamilton	Hamilton County Transfer Station	Fiber	438
Monroe	Hoosier Disposal & Recycling	Single Stream, Fiber	7,435
Lake	Illiana Transfer 1	Single Stream	3,993
Lake	Illiana Transfer 2	Single Stream	1,454
Lake	Illiana Transfer 3	Single Stream	16,018
Lake	Illiana Transfer 4	Single Stream	7,529
Madison	Madison Avenue Transfer Station	Single Stream, Fiber	2,676
Hendricks	Rays East Recycling & Transfer Facility	Fiber, Single Stream	7,682
Hendricks	Rays Resource Recovery & Transfer Station	Fiber, Single Stream	8,663
Hancock	Republic Services Greenfield Transfer Station	Metals	56
Putnam	RHS Recycling and Transfer Station	Single Stream, Fiber	647
Wayne	Rumpke of Indiana Transfer Station	Single Stream	215
Tippecanoe	Tippecanoe County Transfer & Recycling Station	Single Stream	6,303
Porter	Valparaiso Transfer Station	Single Stream	6,483
Knox	Vincennes Transfer Station	Single Stream	600
Kosciusko	Warsaw Transfer Station	Fiber	413
Tippecanoe	Waste Management of Lafayette Wabash Avenue Transfer Station	Fiber	108
La Porte	Waste Management of LaPorte Transfer Station	Single Stream	816
Lake	Waste Management of Northwest Indiana Transfer	Single Stream	1,560
Hendricks	White River Recycling and Transfer	Fiber, Metals	26,137

Transfer stations which reported processed recyclables were mapped (**Map 1C-2**) with different symbols representing the recyclable tonnages that each facility processed for a comparative visual of each MRFs processed materials.

### Map 1C-2 2019 Reported Processed Tons by Transfer Stations in Indiana

2019 Reported Processed Tons by Transfer Stations in Indiana



### Shipments of Recyclables to End Use Markets

The processors and end users are typically where materials go after they are separated and baled/packaged from a MRF. Processors will turn a recyclable material into a usable form for an end user. Some facilities can do both such as a paper mill could have a part of the facility which pulps the fibrous material (paper or cardboard) into a slurry and another part will turn that slurry into a new box or roll of paper. Others may be a processor which sends the material into a usable form for an end user to manufacture such as a glass plant which cleans and crushes glass into the size needed to manufacture fiberglass insulation or glass containers.

*Metals:* reporting facilities have shown metal tonnages sent to Iowa, Georgia, and Florida. More metal tonnages are sent to facilities in Indiana versus out-of-state. *These tonnages represent metals that are collected at the curbside programs or at the drop-offs. These tonnages do not include the significant tonnages of metals that are traditionally recycled from scrap yards and other heavy industry because they are not reported to IDEM. Metals from C&D, salvage, and autobodies are not part of the MSW definition. They are excluded from the recycling rate measurement. Also, metal processing facilities are exempted from submitting mandatory recycling reports.*

*Glass:* Shipments of glass are sent to in-state container mills and fiberglass plants as well as out-of-state locations. Some materials are directly sent out-of-state to be processed and then back into Indiana to be manufactured into new products. These quantities may not be reported to IDEM.

*Fiber:* Reporting facilities have shown about half fiber tonnages are sent out-of-state.

*Plastic:* Reporting facilities have shown a majority of plastic tonnages are sent to in-state facilities.

### Community Recycling Hubs

Recycling hubs are drop-off recycling locations which reported tonnage information to IDEM. These hubs are included as drop-offs under the Residential Recycling Access section below. Recycling hubs may or may not have additional operations such as baling, shipping, and/or other processing systems for collected recyclables.

Private facilities as well as some solid waste management district/government facilities are staff-supported and operate as a community recycling hub for receiving source-separated and/or single stream recyclables from drop-off, curbside, and/or commercial accounts. Some may provide route collection for drop-off and curbside services. These facilities are small-scale with minimal sorting capability to collect, compact/bale, and ship recyclables. A list of recycling hubs is given in Table 1C-3 and shown in Map 1C-3.



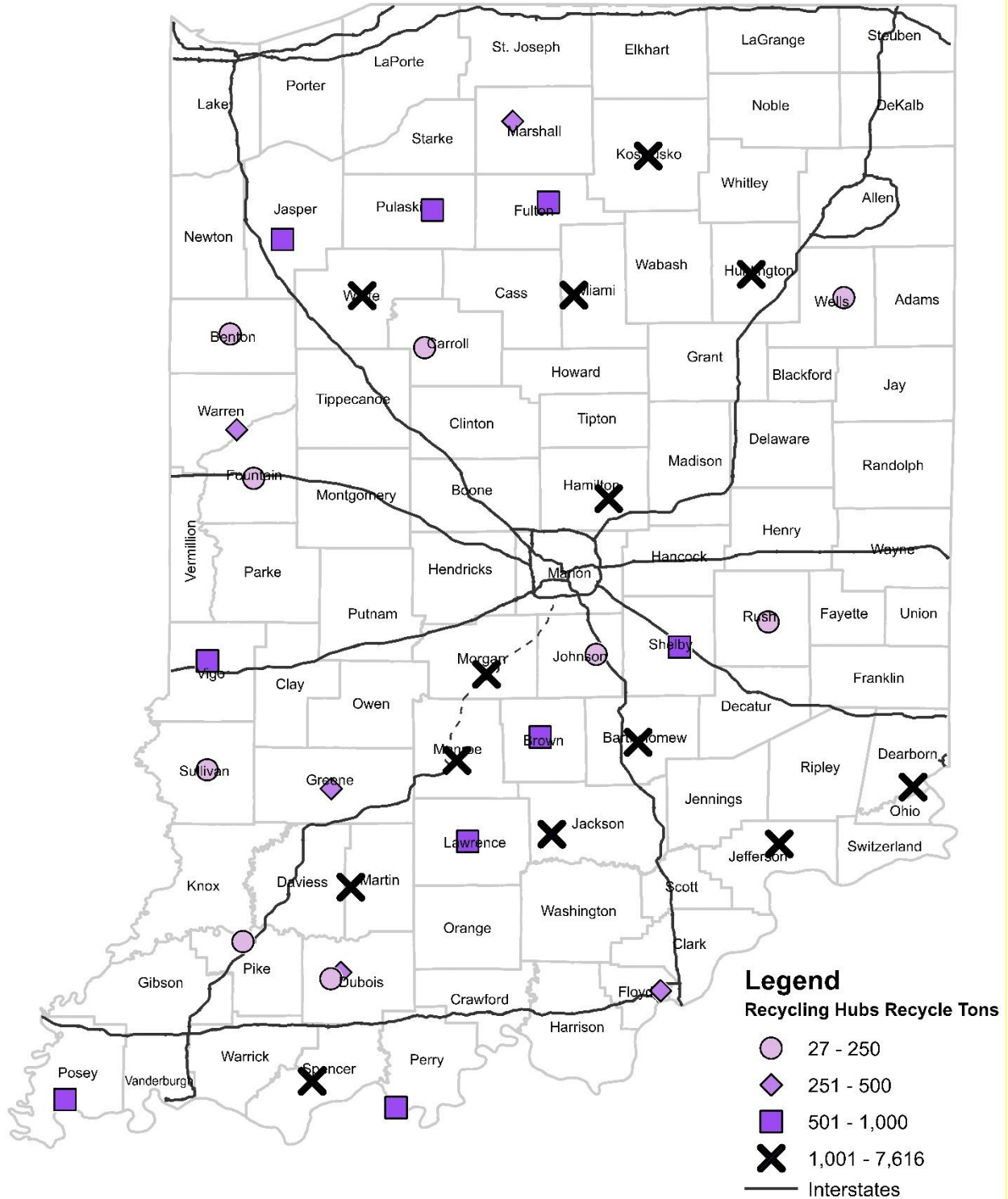
Table 1C-3 2019 Community Recycling Hub Tonnage

County	Registration Name	2019 Tons
Bartholomew	Bartholomew County Solid Waste Management District	2,540
Brown	Brown County Solid Waste Management District	994
Dubois	City of Jasper/Recycling Collection	278
Dearborn	Dearborn County Solid Waste Management District	1,489
Dubois	Dubois County Solid Waste Management District	241
Floyd	Floyd County Solid Waste Management District	383
Fountain	Fountain County Recycle App Station Compost Site	243
Fulton	Fulton County Solid Waste District	971
Greene	Greene County Solid Waste Management District	342
Hamilton	Hamilton County (HHW) Center	1,147
Huntington	Huntington County Solid Waste Management District	1079
Vigo	Indiana State University Recycle Center	997
Johnson	Johnson County Solid Waste Management District	27
Kosciusko	Kosciusko County Solid Waste Management District	1,885
Lawrence	Lawrence County SWMD – Recycling Center	898
Marshall	Marshall County Solid Waste Management District	352
Martin	Martin County Solid Waste Management District	1,576
Jackson	Medora Sanitary Landfill	7,616
Miami	Miami County Solid Waste Management District	1,542
Monroe	Monroe County Solid Waste Management District	2,652
Morgan	Morgan County IN Solid Waste Management District	1,295
Benton	Northwest Indiana SWD/Benton County Recycling	224
Carroll	Northwest Indiana SWD/Carroll County Recycling	128
Jasper	Northwest Indiana SWD/Jasper County Recycling	608
Pulaski	Northwest Indiana SWD/Pulaski County Recycling	948
White	Northwest Indiana SWD/White County Recycling	1,237
Perry	Perry County Recycling Management District	627
Pike	Pike County Solid Waste Management District	196
Posey	Posey County Solid Waste District	786
Rush	Rush County Solid Waste Management District	173
Shelby	Shelby County Recycling District	744
Jefferson	Southeastern Indiana Solid Waste District	1,662
Spencer	Spencer County SWMD	1,052
Sullivan	Sullivan County Recycling Center	53
Warren	Warren County Solid Waste District	480
Wells	Wells County Solid Waste Management District	184



Map 1C-3 2019 Reported Tons Collected by Recycling Hub in Indiana

2019 Reported Processed Tons by Recycling Hubs in Indiana



## Residential Recycling Access

Solid waste districts, cities and towns were surveyed to determine where curbside programs and drop-off locations are located. Curbside was not surveyed to determine if it is optional to sign up, but rather to determine if it is available or not to residents in the community.

### Survey Data Collection Responses

Many survey targets participated in the survey process, and much of the contact information was provided by stakeholders. Many of the survey contacts required research on the company or organization website followed by phone calls to obtain the appropriate person. Surveys were sent by email. See **Table 1C-4** for survey responses.

**Table 1C-4 Survey Responses**

Survey Group	Surveys Sent	Surveys Received	%
Solid Waste Districts	70	54	77%
Indiana Communities*	568	340	60%
Processors and End Users	1,206	29	2%
<b>Total</b>	<b>1,844</b>	<b>423</b>	<b>23%</b>

\*focused on incorporated communities and supplemented with online research. An additional 112 communities were researched with a focus of population over 500.

The response rate was consistent with surveys for similar projects requiring gathering recycling data. Public entities typically have a higher response rate while private industry is more challenging. Private industries, in particular the recycling end users, are not accustomed to responding to such surveys and are often concerned about disclosing proprietary information.

### Curbside

There were 197 communities with non-subscription (not optional) or subscription (optional) curbside recycling programs identified through solid waste districts and community responses. Approximately 57% of the population in Indiana has access to have curbside recycling (though the households may choose to not subscribe or use the curbside programs). See **Table 1C-5**.

- **Private Hauler:** Curbside recycling program collected and hauled by a private company.
- **Public Hauler:** Curbside recycling program collected and hauled by a city or town for their residents.

**Table 1C-5 Community Curbside Recycling Access**

Curbside Recycling (Non-subscription or Subscription)	Number of Communities	% of Communities	Est. Population	% of State Population
At Least One Hauler Offers Curbside Recycling	325	57%	3,848,223	57%
No Hauler for Recycling	245	43%	741,985	11%
Unincorporated Areas	N/A	N/A	2,141,792	32%
<b>Total</b>	<b>570</b>	<b>100%</b>	<b>6,732,000</b>	<b>100%</b>

There is approximately one third of the population which is living in the unincorporated areas of Indiana (population not tied to a city or town). These areas are not population dense but cover a large area of Indiana on the map.

Although access to curbside recycling is undetermined, there is greater access to curbside recycling outside of municipalities. These areas were outside the surveyed communities and were outside of what the survey information could collect. Unincorporated areas may have private haulers which offer curbside collection by individual household contracts.

### *Drop-offs*

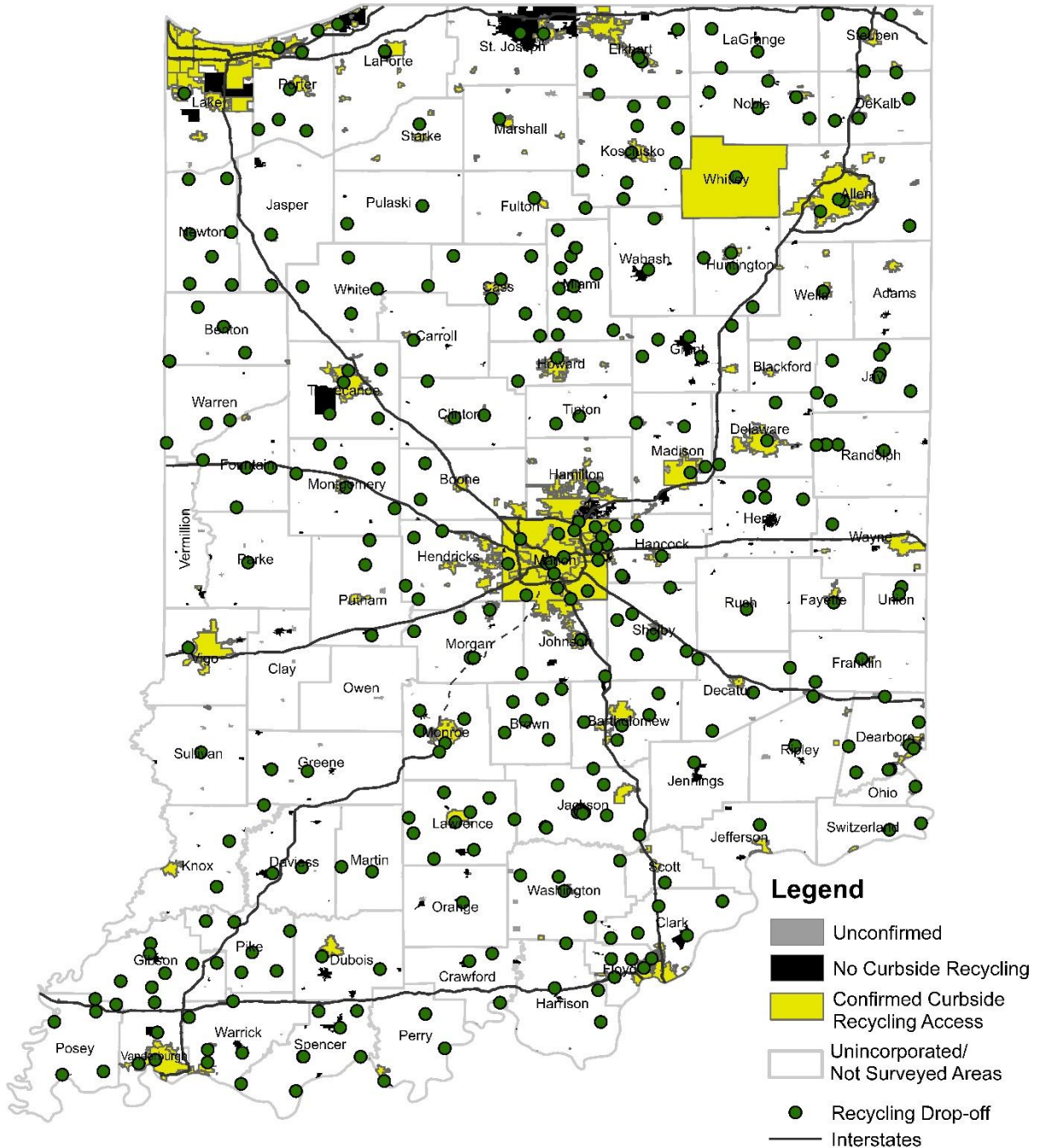
There were 313 drop-off recycling locations identified through solid waste districts and community responses. Drop-off recycling locations are areas designated for residents to drop-off recyclable materials in containers set up by a district, community, or facility. Drop-off containers typically collect, cardboard, paper, aluminum/steel cans, and plastic bottles and jugs. Drop-off recycling locations assist residents with recycling access in lieu or in addition to having curbside recycling collection.

The following map, **Map 1C-4**, shows both reported curbside and drop-off access. Boundaries for cities and towns are limited to the incorporated areas; unincorporated areas were not confirmed. Services may extend to unincorporated areas, but this was not confirmed. Private hauler data collection is not available in many areas such as unincorporated areas. The following map shows data collected and reported through surveying solid waste districts, cities, and towns.

Gaps between curbside and drop-off locations may be due to lack of reported information (both to survey and available online) or to limited access for residents.

Map 1C-4 Community Recycling Access

Curbside and Drop-Off Recycling Access in Indiana





### *Recycling Access Conclusions*

Recycling access measures how many residents have curbside recycling or a drop-off recycling program available in their community. Access to recycling opportunities is important for consumers in all regions to manage their waste responsibly.

In almost all areas of the state, recycling was accessible by curbside or drop-off programs. Some areas were only provided drop-off access, some areas only had access to recycling via curbside collection, some areas had both, and other residents may have to drive longer distances (such as the other side of a county) to reach a recycling drop-off. Through conversation with small communities, drop-offs in less densely populated areas were roughly a 15 to 30-minute drive for residents. More densely populated areas also tend to have more multi-family housing which may or may not have a recycling program on site (such as apartment complexes) and have more drop-off recycling available.

Even if a city provides curbside service services to single-family housing, the remaining population may or may not have access based on their location to the nearest drop-off. Most drop-offs in the state are overseen by solid waste districts. A few drop-offs are provided by the community in lieu of a curbside program. Some drop-offs are in addition to curbside access.

Many haulers do not offer curbside recycle collection based on distance to the nearest recycling transfer station or MRF, cost of recycling tipping fees, density of routes, and a low number of residents willing to pay for recycle collection services. Locations where recyclables can be delivered is crucial for haulers in order to offer a curbside program. The closer a MRF is to a community the more likely recycling is offered as a service. Indianapolis has a subscription based curbside recycling system (a household can choose to opt in or not). Approximately 11% of households subscribe with one of the 2 haulers which offer the service.

**Map 1C-4** shows the reported programs that provide access to recycling to residents. This information was gathered via survey. Many smaller communities did not respond to the survey while others did not share information regarding recycling options in the community. Based on the surveys received and researched, 89 of the 92 (97%) of the counties in Indiana have access to recycling. The remaining three counties Vermillion, Clay, and Owen did not return the survey and research provided no information that recycling access is available in those counties.

MRFs are located in higher populated areas because more tonnages will be collected necessary to operate the facility. Some MRFs may be limited based on the type of materials they collect. Seven of the 14 MRFs which report tonnages to IDEM identify as single stream MRFs which can easily process single stream material from curbside programs. There is a higher operating cost to single stream MRFs, but single stream is easier to collect from curbside and drop-off programs rather than collecting separated materials (typically fiber and container separation).



There are opportunities to work with areas which do not have access to recycling and assess where it would make sense for a MRF to be built. MRFs can be publicly or privately owned. Quick access off a main road is important if haulers or transfer trailers are delivering materials. In addition, easy access is also important to the MRF shipping materials to brokers or processors. There are also opportunities to assist communities to create new recycling collection programs or work with haulers to provide these services in order to increase access to recycling across the state.

## Organics

Compost facilities collect and process organic material into a new product such as a soil amendment or fertilizer. Organic materials can be yard waste (grass, brush, leaves), food waste, wood waste (not painted or treated), and paper.

**Table 1C-6** presents the 116 registered compost facilities which reported tonnage to IDEM. Tonnages for 2019 were reported below and those which did not report tonnages but remain registered are also listed.

**Table 1C-6 2019 Registered Compost Facility Tonnages by County Location of Sites**

County	Number of Reported Facilities	Yard Waste Tons	Food Waste Tons	Wood Tons	Other Tons	Paper Tons	2019 Total Tons Collected
Adams	2	3,834	0	60	0	0	3,894
Allen	3	3,032	55	155	315	0	3,557
Bartholomew	2	12,393	0	577	0	0	12,970
Blackford	1	350	0	0	5	0	355
Boone	2	5,516	11,144	239	4,343	0	21,242
Cass	2	3,527	0	274	0	0	3,801
Clark	2	10,263	0	486	0	0	10,749
Daviess	1	525	0	332	0	0	857
De Kalb	1	13,774	0	0	0	0	13,774
Dearborn	1	859	0	0	0	0	859
Decatur	1	1,052	0	550	45	0	1,647
Delaware	1	0	0	0	0	0	0
Dubois	2	3,234	0	934	0	0	4,168
Elkhart	3	5,767	0	3,013	0	0	8,780
Fayette	1	53	0	25	65	0	143
Floyd	2	38,395	6,517	15	527	0	45,454
Fountain	2	15	0	2	0	0	17
Franklin	1	135	0	0	0	0	135
Fulton	1	636	0	31	0	0	667
Gibson	1	25,000	0	0	0	0	25,000

## Indiana Recycling Infrastructure & Economic Study

County	Number of Reported Facilities	Yard Waste Tons	Food Waste Tons	Wood Tons	Other Tons	Paper Tons	2019 Total Tons Collected
Grant	1	3	0	50	0	0	53
Hamilton	3	8,471	379	636	787	0	10,273
Hendricks	2	2,812	0	681	0	0	3,493
Howard	2	449	0	0	0	0	449
Jackson	1	144	0	39	0	0	183
Jasper	2	700	0	0	0	0	700
Jay	1	10	0	0	0	0	10
Jefferson	2	1,116	0	640	0	0	1,756
Johnson	2	532	0	0	0	0	532
Knox	1	187	0	10	0	0	197
Kosciusko	1	458	0	0	21	0	479
La Porte	2	3,794	0	1,171	0	0	4,965
Lagrange	3	648	0	0	0	0	648
Lake	7	21,490	49	4,009	0	0	25,548
Lawrence	1	573	0	262	0	0	835
Madison	1	745	0	0	0	0	745
Marion	4	11,661	671	2,400	562	0	15,294
Martin	1	0	0	0	0	0	0
Monroe	5	2,950	240	2,070	93	0	5,353
Montgomery	0	0	0	0	0	0	0
Morgan	1	2,500	0	0	0	0	2,500
Newton	1	2,918	0	0	0	0	2,918
Noble	1	7,147	0	0	0	0	7,147
Ohio	1	245	0	270	0	0	515
Pike	2	0	0	90	0	0	90
Porter	7	51,855	0	13,393	14	10,767	76,029
Pulaski	2	262	0	357	0	0	619
Randolph	3	946	0	562	0	0	1,508
Ripley	1	21	0	0	0	0	21
Shelby	1	11,983	0	922	263	0	13,168
Spencer	1	12	0	1,200	10,312	0	11,524
St Joseph	2	16,545	0	792	0	0	17,337
Starke	1	574	0	0	0	0	574
Steuben	2	2,410	0	0	0	0	2,410
Tippecanoe	4	2,333	0	1,000	854	0	4,187
Tipton	1	0	0	0	0	0	0
Vanderburgh	2	342	0	34	45	0	421
Vigo	2	13	0	0	2	0	15
Wabash	1	800	0	810	0	0	1,610



County	Number of Reported Facilities	Yard Waste Tons	Food Waste Tons	Wood Tons	Other Tons	Paper Tons	2019 Total Tons Collected
Warrick	1	712	0	0	0	0	712
Wayne	3	717	5	1,094	8	0	1,824
White	1	400	0	0	100	0	500
Whitley	1	410	0	171	0	0	581
<b>Total</b>	<b>116</b>	<b>288,248</b>	<b>19,060</b>	<b>39,356</b>	<b>18,361</b>	<b>10,767</b>	<b>375,792</b>

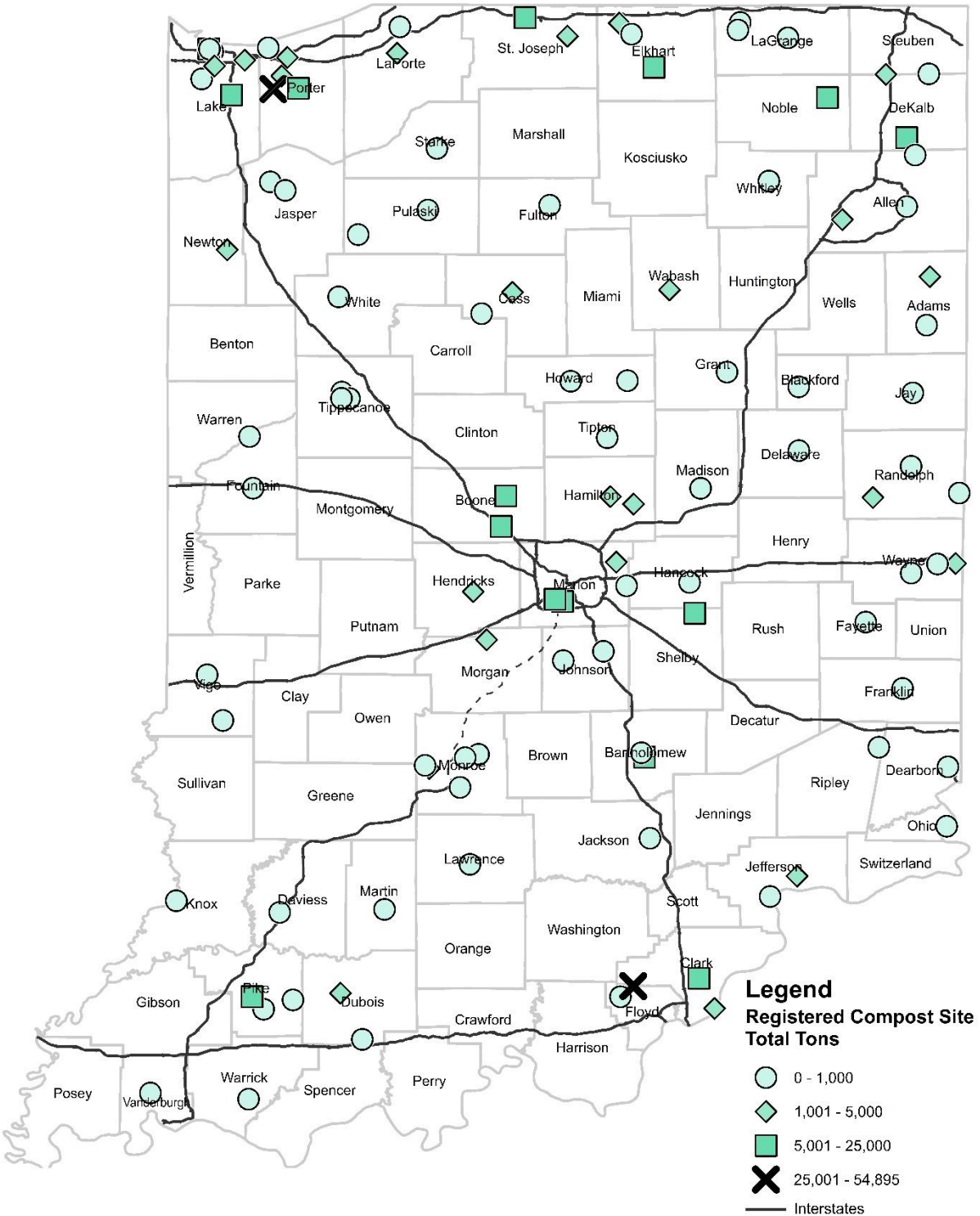
\*Other includes: animal bedding (80% straw), corn cobs, manure, fill dirt (with organics), mixed organic material, concrete aggregate, and street sweepings.

See **Appendix E** for individual reporting compost registered facilities.

Compost facilities were mapped (**Map 1C-5**) with a color gradient to visually show the quantity of handled organics.

## Map 1C-5 2019 Registered Compost Facilities

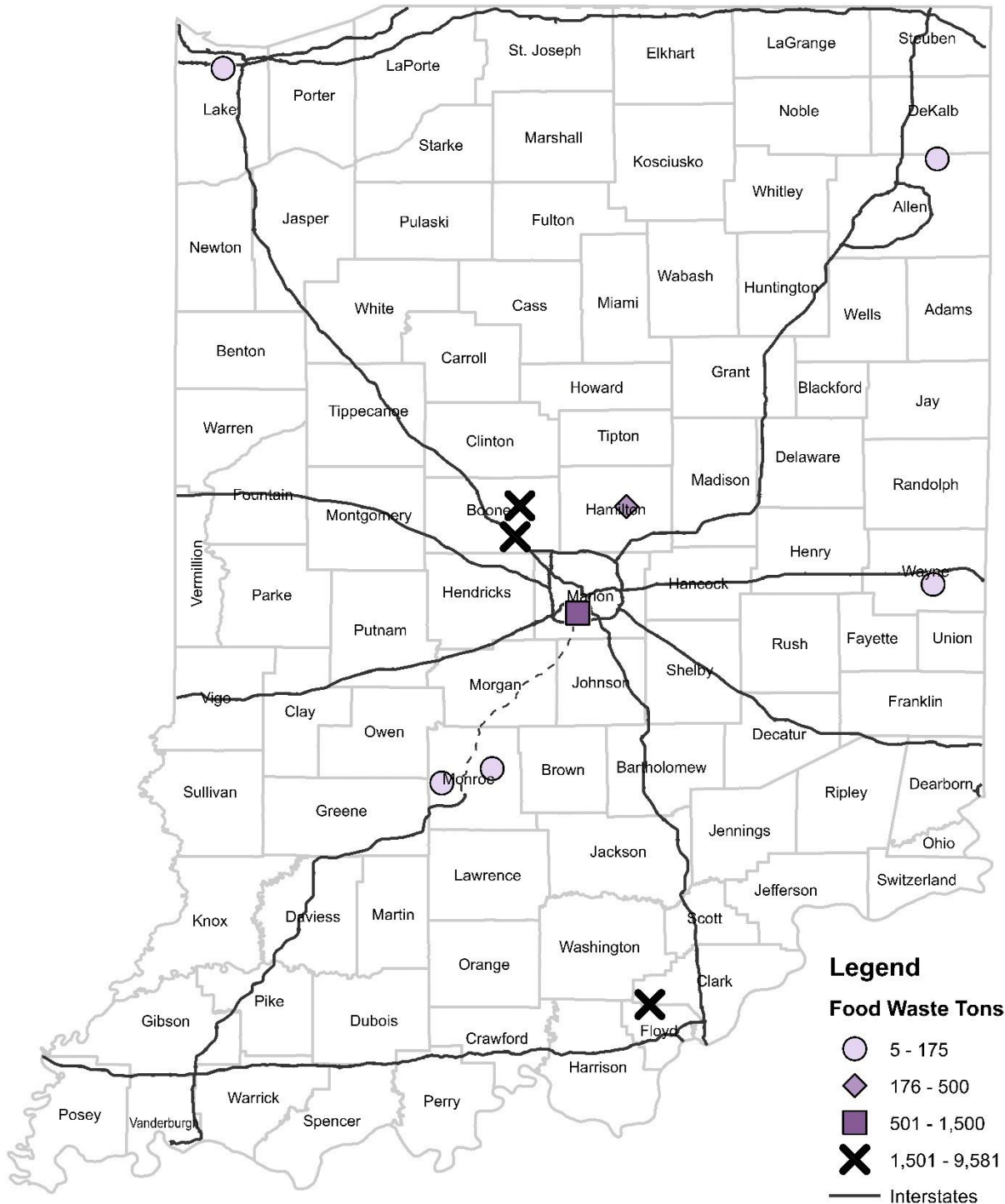
### 2019 Registered Compost Facilities in Indiana



Facilities which reported food waste were mapped (**Map 1C-6**) with a color gradient to visually show the quantity of handled organics.

**Map 1C-6 2019 Reported Tonnage for Food Waste in Indiana from Registered Compost Facilities**

2019 Reported Tonnage for Food Waste  
in Indiana from Registered Compost Facilities



Facilities which reported wood waste were mapped (**Map 1C-7**) with a color gradient to visually show the quantity of handled organics. This wood was either ground at the facility or shipped to another facility to be ground.

**Table 1C-7 2019 Wood Waste Reported Tonnages by County Location of Sites**

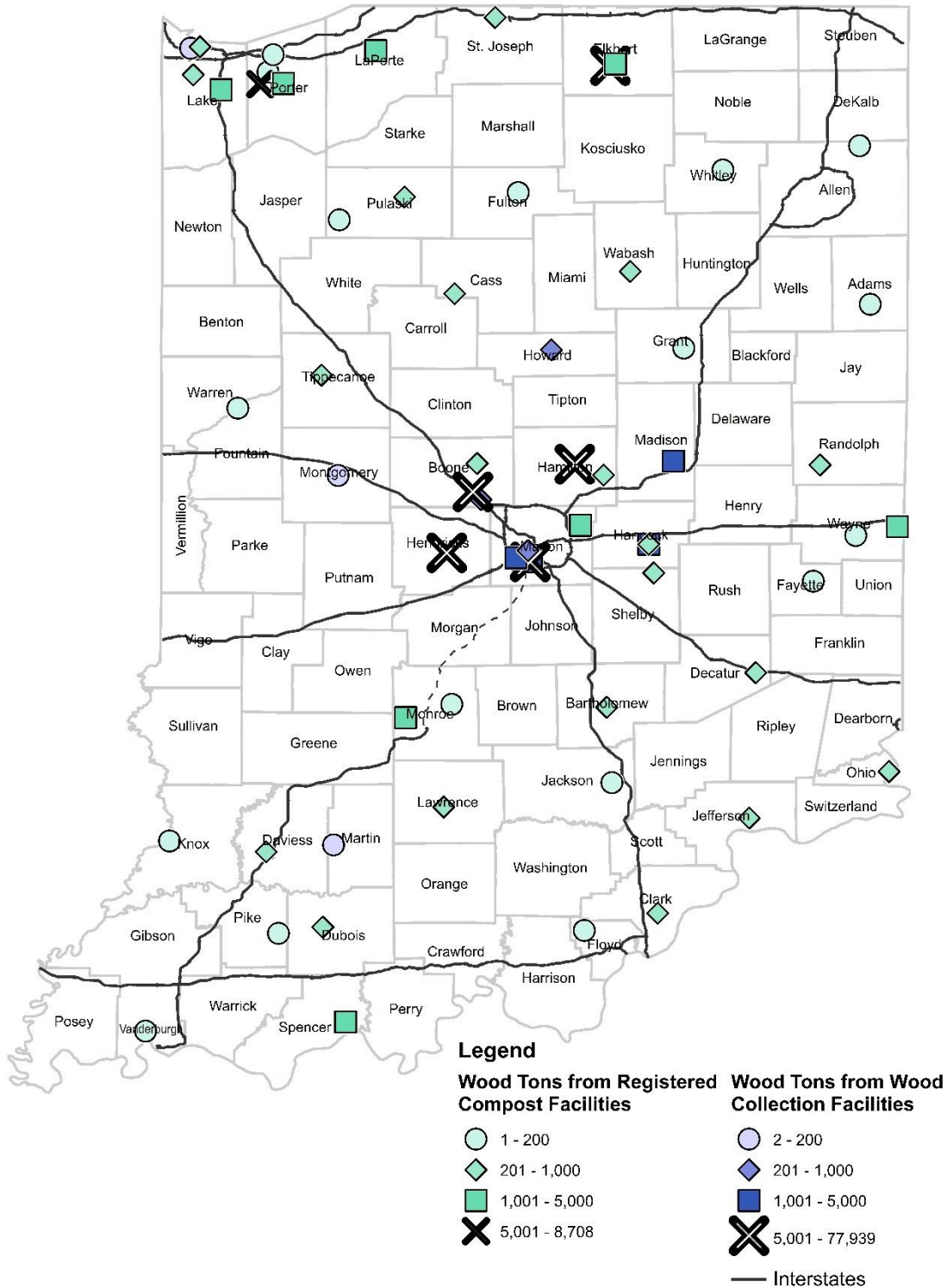
County	Number of Reported Facilities	Wood Tons	2019 Total Tons Collected
Boone	1	20,429	20,429
Elkhart	1	77,939	77,939
Hamilton	1	33,652	33,652
Hendricks	4	14,562	14,562
Howard	1	359	359
Lake	1	50	50
Madison	1	4,878	4,878
Marion	3	38,335	38,335
Martin	1	2	2
Montgomery	1	146	146
<b>Total</b>	<b>15</b>	<b>190,352</b>	<b>190,352</b>

For **Map 1C-7**, wood tonnages from **Table 1C-6** and **Table 1C-7** were used to show wood processed in Indiana.



# Map 1C-7 2019 Reported Tonnage for Wood Waste from Compost Facilities and Wood Collection Facilities in Indiana

2019 Reported Tonnage for Wood Waste from Compost Facilities and Wood Collection Facilities in Indiana



## PART 2. ECONOMIC IMPACT ON THE STATE'S ECONOMY

Recycling supports Indiana's economy through the act of collecting, sorting, and processing recyclable materials. Additionally, recycled materials, as one of the many commodities used in the manufacturing process, contribute to the value of manufacturing output.

The following sections use input-output modeling to estimate the following:

- The value of the recycling industry (collection, sorting, and processing of materials)
- The estimated share of manufacturing's economic impact attributable to the use of recycled commodities
- The total economic contribution of the end user companies that use recycled materials to Indiana's economy

### A. METHODOLOGY

---

Input-output modeling is the most commonly used method to estimate the direct, indirect, and induced economic contributions of a company or companies. IMPLAN is the model used in this analysis and is one of the two most commonly used input-output models in these types of analyses. It was built by the Bureau of Labor Statistics and based on business-to-business and consumer spending. The input-output model estimates the three following types of transactions until no new economic value is added to the economy:

**Direct impacts** represent the company-specific or commodity-specific value (revenue, employment, and compensation). Direct impacts are the initial injection into the economy. Using revenue, employment, and/or compensation as an input, IMPLAN seeks to follow the effects of company and employee spending as it impacts the economy (indirect and induced impacts).

**Indirect impacts** represent the economic benefits attributed to company spending on goods and services. Indirect impacts represent business-to-business supply chain purchases. In economic terminology, this is often referred to as the multiplier effect caused by an injection of spending. For example, a recycling company must purchase supplies and machinery that then requires the companies selling and producing those goods to purchase the goods and services required to produce the supplies and machinery purchased by the manufacturing company.

**Induced impacts** represent the value of employed spending. Induced impacts are the impacts to the economy caused by employee spending. For example, an employee uses wages earned to purchase a house, groceries, attend events, dine at restaurants and many other purchases; this spending supports workers at those establishments, and those employees then spend their wages on similar items.

## Inputs

The initial input value is a critical element to ensuring an accurate estimate of the economic impact of the recycling industry. The initial input value added into the IMPLAN model drives the model and the estimated impacts. The value of recycled commodities are the initial input values for this analysis. The impacts from each recycled material in this report will be described prior to the display of impact estimates.

To estimate the value of recycled commodities generated in Indiana to the manufacturing economy, the tons of recycled material (paper, plastic, glass, ferrous metal, and non-ferrous metal) contained in IDEM's 2019 Recycling Activity Summary (November 2020) are converted into a commodity value by using a range of values provided by averaging the 12-month market pricing for 2019. **Table 2B-4** displays the number of tons used by manufacturers in Indiana and the range of price per recycled ton, followed by the estimated total commodity values used as input for the model. The IMPLAN input categories are based on North American Industry Classification System (NAICS) codes provided in end user survey responses and represent glass, paper, plastic, ferrous metal, and non-ferrous metal used by manufacturers/end users. NAICS codes used in this study are listed in **Appendix F**. NAICS codes are self-reported by businesses and may not be audited for accuracy.

The commodity tons used as inputs were provided primarily by the IDEM Re-TRAC system of reporting. The recycling processors providing the recycling data primarily support the collection infrastructure for residential and commercial sectors. Also, a large quantity of tons of recyclables is received from the ICI sectors. Some commodity processors, in particular metals processors, are not part of this collection and processing infrastructure and are not required to report tons of metals recycled. Thus, the tonnage used for the economic analysis of recycling commodities only accounts for tons collected and processed by the current residential and commercial programs in Indiana. The direct economic impact reflects only those tons reported through Re-TRAC in **Part 2 Section B**. The direct economic impact of recycling is understated by the tons of residential and commercial recycling commodities that have not been reported. Commercial businesses are generators of recyclables and are not required to report recycling through the Re-TRAC system. Many do not send recyclables to Indiana MRF's and may use brokers or directly ship recyclables to end use markets. These tons cannot be determined and are not using the recycling infrastructure being evaluated in this study. However, the overall economic impact which includes all recycling is projected in **Part 2 Section C**.

## Outputs

Once the commodity values for each material are established, they are used as an input to IMPLAN to establish the three output categories: value added, jobs/employee compensation, and manufacturing output associated with the recycled commodities. Employee compensation is defined as total payroll paid to employees (wages and salaries, benefits, and payroll taxes). Value added is the contribution of the unit to the

GDP. Manufacturing output is the total value of production of the product over a calendar year as company and employee spending work their way through the economy. All outputs include direct impacts, indirect impacts, and induced impacts.

## B. THE ECONOMIC CONTRIBUTIONS OF THE RECYCLING INDUSTRY

### The Economic Contribution of Employees

In 2019, according to ReferenceUSA<sup>7</sup> there were 4,255 full-time-equivalent (FTE) jobs in the recycling industry in Indiana, including companies and organizations that collect, broker, and process recyclables (see **Table 2B-1** and **Table 2B-2**). However, it is possible that companies may report under different NAICS codes which are not included in the list of codes analyzed. Based on this input, as spending by companies and employees works its way through Indiana's economy, an additional 4,278 spinoff (or indirect and induced) jobs attributable to employee and business spending are created. Theoretically, as more recyclable materials are generated and collected, more direct hauler, broker, and processor jobs will be needed as these jobs are directly linked to the number of tons needing to be managed.

**Table 2B-1: NAICS Codes for Haulers and Brokers**

Category	NAICS	Description
Hauler	562111	Solid Waste Collection*
	562119	Other Waste Collection
	924110	Admin-Air & Water Resource/Solid Waste Management Programs
Broker	523140	Commodity Contracts Brokerage
	562920	Materials Recovery Facilities

\*These employees may or may not include waste collection from municipal-run programs which may be represented under a different NAICS code for the whole municipality.

The jobs attributable to direct, indirect, and induced effects generate \$513,895,064 in employee compensation (wages and benefits). When all actions taken by recycling companies and their employees are considered, the industry adds \$1.74 billion to Indiana's economy (see **Table 2B-2**).

**Table 2B-2: Total Economic Contribution of MSW Recycling Companies & Their Employees**

	Direct	Indirect & Induced	Total
<b>Employment</b>	4,255	4,278	8,533
<b>Employee Compensation</b>	\$282,060,456	\$231,834,608	\$513,895,064
<b>Value Added</b>	\$586,851,454	\$388,289,298	\$975,140,752
<b>Output</b>	\$1,034,863,496	\$702,829,848	\$1,737,693,344

<sup>7</sup> Infogroup. (2021, April). List of companies in Indiana with NAICS codes: 562111, 562119, 924110, 523140, 562920. ReferenceUSA. Retrieved April 22, 2021, from <https://www.referenceusa.com>

**Table 2B-3** displays the NAICS code industries by title that benefit most from economic activity attributable to the recycling industry. The table first shows the industries' total economic output as well as the economic output that the recycling industry contributed to directly, indirectly, and/or induced. Among the industry sectors that benefit most from employee spending (induced) are real estate and housing, health services, and restaurants. The industries that benefit most from spending of recycling companies (indirect) includes most trucking companies, utilities, petroleum refineries, and consulting.

**Table 2B-3: Industry Sectors Impacted Most by Recycling Operations**

	Industry Total Output	Recycling Contribution
Other real estate	\$24,827,440,841	\$41,690,797
Owner-occupied dwellings	\$26,769,809,599	\$35,606,956
Hospitals	\$22,315,077,968	\$27,511,743
Employment services	\$8,731,181,632	\$24,291,414
Management of companies and enterprises	\$8,349,963,031	\$21,699,442
Insurance carriers, except direct life	\$16,101,572,901	\$17,806,292
Car washes	\$2,456,212,077	\$16,108,417
Offices of physicians	\$11,279,931,964	\$14,291,757
Full-service restaurants	\$6,820,500,363	\$13,075,308
Monetary authorities and depository credit intermediation	\$8,720,629,054	\$11,565,468
Truck transportation	\$11,357,044,515	\$9,980,051
Limited-service restaurants	\$8,968,000,130	\$9,785,256
Electric power transmission and distribution	\$8,648,620,477	\$9,489,981
Petroleum refineries	\$15,225,351,734	\$9,214,564
Management consulting services	\$3,326,477,460	\$8,664,927
Wholesale - Machinery, equipment, and supplies	\$4,962,555,755	\$8,506,064
Insurance agencies, brokerages, and related activities	\$9,352,532,733	\$8,465,253
Tenant-occupied housing	\$8,135,545,954	\$8,430,052
Automotive repair and maintenance, except car washes	\$3,966,647,476	\$8,349,880

### The Economic Contributions of Recycled Commodities (Tons and Value)

In addition to basic recycling operations of collection, sorting, and processing, the use of recycled commodities contributes to the value of products manufactured throughout Indiana. To estimate the value of recycled commodities generated in Indiana to the manufacturing economy, the tons of recycled material (paper, plastic, glass, ferrous metal, and non-ferrous metal) contained in IDEM's 2019 Recycling Activity Summary (November 2020) are converted into a commodity value by using a range of values provided by averaging the 12-month market pricing for 2019.

#### *Commodity Value of Recyclables Used In-State*

**Table 2B-4** displays the tons generated and used in Indiana and the range of price per recycled ton for each recycled material, followed by the average estimated commodity

values (**Table 2B-5**) which is used as input for estimating the total economic activity attributable to the use of recycled commodities in Indiana.

**Table 2B-4: 2019 Tons and Price per Ton of Recyclables Generated & Used in Indiana**

	Tons	Price per Ton (High)	Price per Ton (Low)	Price per Ton (Average)
Glass	109,976	\$31.00	\$10.00	\$20.50
Metal Ferrous	11,065	\$151.17	\$27.95	\$89.56
Metal Non-Ferrous	1,145	\$1,103.38	\$539.35	\$821.37
Paper	265,365	\$84.46	\$42.60	\$63.53
Plastic	10,280	\$478.72	\$258.82	\$368.77
Organic	318,751	\$32.00	\$3.00	\$17.50
<b>Total</b>	<b>716,582</b>			

**Table 2B-5: Total Commodity Value of Recyclables Generated & Used in Indiana**

	High	Low	Average
Glass	\$3,409,256	\$1,099,760	\$2,254,508
Metal Ferrous	\$1,672,696	\$309,267	\$990,981
Metal Non-Ferrous	\$1,263,370	\$617,556	\$940,463
Paper	\$22,412,728	\$11,304,549	\$16,858,638
Plastic	\$4,921,242	\$2,660,670	\$3,790,956
Organic	\$10,200,032	\$956,253	\$5,578,143
<b>Total</b>	<b>\$43,879,324</b>	<b>\$16,948,054</b>	<b>\$30,413,689</b>

#### *Commodity Value of Recyclables Sent Out-of-State*

Indiana-based recycling companies export over 400,000 tons of recyclable to other states and countries, per the IDEM 2019 Recycling Activity Summary. The collection, sorting, and processing of these exported recyclables contribute to the economic contribution of recycling companies; however, once exported, their contribution to Indiana's economy is complete. **Table 2B-6** shows value of exported tons.

**Table 2B-6: 2019 Tons of Exported Recyclables and Lost Value to Indiana's Economy**

	Tons	High	Low	Average
Glass	148,204	\$4,594,324	\$1,482,040	\$3,038,182
Metal Ferrous	7,124	\$1,076,935	\$199,116	\$638,025
Metal Non-Ferrous	1,284	\$1,416,740	\$692,525	\$1,054,633
Paper	230,318	\$19,452,658	\$9,811,547	\$14,632,103
Plastic	18,467	\$8,840,522	\$4,779,629	\$6,810,076
<b>Total</b>	<b>405,397*</b>	<b>\$35,381,180</b>	<b>\$16,964,857</b>	<b>\$26,173,018</b>

\*This is a conservative analysis of tons due to an excluded and uncategorized (in-state vs out-of-of-state) 138,429 tons.



*Commodity Value of All Recyclables Generated: Used In-State, Sent Out-of-State, and Arranged by Brokers*

In addition to the in-state and out-of-state activity, broker shipments were included below as they were not captured in previous sections. **Table 2B-7** shows tonnages reported to IDEM for broker arranged shipments.<sup>8</sup>

**Table 2B-7: 2019 Tons of Broker Arranged Shipments**

	Broker Arranged Shipments (Tons)
Glass	9,627
Metal Ferrous	434
Metal Non-Ferrous	246
Paper	118,700
Plastic	9,422
Total	138,429

Tons from **Table 2B-4**, **Table 2B-6**, and **Table 2B-7** were combined in **Table 2B-8**. The tons were used with the range of price per recycled ton for each recycled material (**Table 2B-3**) to estimate the total economic activity attributable to the use of recycled commodities in Indiana sent out-of-state and arranged by brokers.

**Table 2B-8: Total Commodity Value of Recyclables Generated in Indiana**

	Tons	High	Low	Average
Glass	267,807	\$8,302,017	\$2,678,070	\$5,490,044
Metal Ferrous	18,623	\$2,815,239	\$520,513	\$1,667,876
Metal Non-Ferrous	2,675	\$2,951,542	\$1,442,761	\$2,197,151
Paper	614,383	\$51,890,788	\$26,172,716	\$39,031,752
Plastic	38,169	\$18,272,264	\$9,878,901	\$14,075,582
Total	941,657	\$84,231,849	\$40,692,960	\$62,462,405

*Economic Contributions of Recycled Commodities to End Users*

The economic contributions of recyclables to end users represents the supply side of the recycling circular economy. The end users represent the demand side of the recycling circular economy.

For the recycling supply side analysis, in this study, only the recycling tons reported to the Re-TRAC system were used for the economic contribution to end users. The Re-TRAC supply side recycling infrastructure in this study represents only residential and some of the commercial supply side recyclables for end users. As a result, the employment and compensation for the supply side infrastructure does not represent the full employment from all recycling.

<sup>8</sup> IDEM 2019 Recycling Activity summary.

Recycled commodities are used primarily by manufacturers of multiple types of products. The recycled commodities are only a portion of the total amount of materials and labor used by those companies as feedstock to produce their final product as these manufacturers also use raw materials in their processes. This section of the Study focuses on estimating the economic value of the recycled materials used in the manufacturing process as reported through the IDEM Re-TRAC reporting system which represents recycling tons collected and delivered to Indiana's recycling infrastructure. It does not include direct end use shipments of recyclables by commercial and industrial generators who are not required to report and did not respond to the surveys as part of this study.

The employment and compensation for each of the supply side commodities listed below are included in the demand side total employment analysis in **Part 2 Section C**. Also, because supply side recycling commodities from the Indiana infrastructure, as reported to Re-TRAC, represent only a portion of the overall feedstock, the employment analysis is understated and is not significant when compared to total employment of the end users.

### Glass

Using 2019 data, nearly 110,000 tons of recycled glass are used by Indiana companies annually from in-state origins. The economic contribution of recycled glass to the total output of companies using it ranges from over \$6 million to a low of just under \$2 million, based on the value range of recycled glass in **Table 2B-9**. Additionally, an average of 33 jobs in Indiana's workforce are attributable either directly, indirectly, or induced to the use of recycled glass in manufacturing.

**Table 2B-9: Economic Contributions of Recycled Glass Commodity to Manufacturers**

	High	Low	Average
<b>Employment</b>	50	16	33*
<b>Employee Compensation</b>	\$2,001,616	\$645,682	\$1,323,649
<b>Value Added</b>	\$3,058,765	\$986,699	\$2,022,732
<b>Output</b>	<b>\$6,059,584</b>	<b>\$1,954,704</b>	<b>\$4,007,144</b>

\*Employment included in overall commodity industry employment analysis in **Part 2 Section C**.

### Non-ferrous Metal

Non-ferrous metals include aluminum, nickel, lead, tin, brass, silver, and zinc. Using 2019 data, approximately 1,145 tons of recycled non-ferrous metals are generated and used in Indiana annually. However, the actual tonnage generated and used may be higher due to responses and shared data being voluntary and not all processors share data. The use of this commodity in the manufacturing process is responsible for between \$2.2 (high) and \$1 million (low) dollars of the over \$70 billion dollars of economic activity produced by companies using recycled non-ferrous metal as part of the manufacturing process (**Table 2B-10**).

**Table 2B-10: Economic Contributions of Non-ferrous Metal to Manufacturers**

	High	Low	Average
<b>Employment</b>	10	5	7*
<b>Employee Compensation</b>	\$694,589	\$327,185	\$498,263
<b>Value Added</b>	\$1,148,169	\$540,843	\$823,638
<b>Output</b>	<b>\$2,207,025</b>	<b>\$1,039,615</b>	<b>\$1,583,208</b>

\*Employment included in overall commodity industry employment analysis in **Part 2 Section C**.

### Ferrous Metal

Ferrous metals include alloy steel, carbon steel, cast iron, and wrought iron, and Indiana companies use 11,065 tons in the manufacturing process annually. While the use of ferrous metal makes a relatively small contribution to the steel industry (around \$2 million) **Table 2B-11**, the companies that use recycled ferrous metal generate nearly \$25 billion of economic activity in Indiana.

**Table 2B-11: Economic Contributions of Ferrous Metal to Manufacturers**

	High	Low	Average
<b>Employment</b>	8	4	6*
<b>Employee Comp</b>	\$557,027	\$262,387	\$399,583
<b>Value Added</b>	\$1,002,974	\$472,449	\$719,483
<b>Output</b>	<b>\$2,161,665</b>	<b>\$1,018,248</b>	<b>\$1,550,669</b>

\*Employment included in overall commodity industry employment analysis in **Part 2 Section C**.

### Fiber

Fiber recyclables include a range of paper and cardboard products and are by weight (265,365 tons) the most commonly recycled product captured and used in Indiana. Recycled fiber also makes the largest commodity-based economic contribution, contributing about \$18.8 to \$40 million to the economy from companies using recycled fiber as part of their business (**Table 2B-12**).

**Table 2B-12: Economic Contribution of Recycled Fiber to Manufacturers**

	High	Low	Average
<b>Employment</b>	263	124	189*
<b>Employee Comp</b>	\$12,372,114	\$5,827,860	\$8,875,128
<b>Value Added</b>	\$18,562,985	\$8,744,058	\$13,316,145
<b>Output</b>	<b>\$39,944,969</b>	<b>\$18,815,999</b>	<b>\$28,654,497</b>

\*Employment included in overall commodity industry employment analysis in **Part 2 Section C**.

### Plastics

Using 2019 data, Indiana companies use 10,280 tons of recycled plastics that are collected, sorted, and process in Indiana annually. The use of recycled plastics by

Indiana companies adds an average of 50 jobs, \$1.9 million in employee compensation, and nearly \$6.5 million to the economy (**Table 2B-13**).

**Table 2B-13: Economic Contribution of Recycled Plastics to Manufacturers**

	High	Low	Average
<b>Employment</b>	70	33	50*
<b>Employee Comp</b>	\$2,712,068	\$1,277,514	\$1,945,500
<b>Value Added</b>	\$4,023,061	\$1,895,055	\$2,885,940
<b>Output</b>	\$8,988,577	\$4,234,052	\$6,447,950

\*Employment included in overall commodity industry employment analysis in **Part 2 Section C**.

## C. ECONOMIC IMPACT OF INDIANA MANUFACTURERS AND END USERS THAT USE RECYCLED COMMODITIES

### Potential Recycling End Users - Locations

The following section has been broken down into two parts by material in order to show where materials may be (or have potential to be) used by an end user. Listed types of facilities may use 0 tons of recycled materials, while other facilities may use different ratios of recycled materials versus virgin materials used as feedstock.

The first part of each material's section shows a map of companies which have the listed NAICS codes. The maps below do not represent an equally shared usage of materials; different end users may potentially use different amounts of recycled materials.

For the second part of each material's section, materials reportedly sent to another facility after processing (such as a MRF to an end user) are mapped to present the flow of material out of the state of Indiana. Material flows within Indiana were not mapped.

This section identifies where the potential end users for recycled commodities are located, provides a general flow of recycled materials sent out-of-state, and provides the total employment data for end users who use recycled material. This employment data includes the employment and economic data from a portion of recyclables from Indiana identified in **Part 2 Section B**, recycled commodities from out of state, and virgin commodities. The employment and economic data represent the full demand side or economic opportunities for recycled commodities collected and processed in Indiana. However, if more Indiana recyclables are used by the end users it does not necessarily impact or increase the overall demand for their products. Thus, the economic benefit of using more recyclables is not correlated to end user overall output and could be insignificant unless there are further increases in end user infrastructure using recycled commodities.

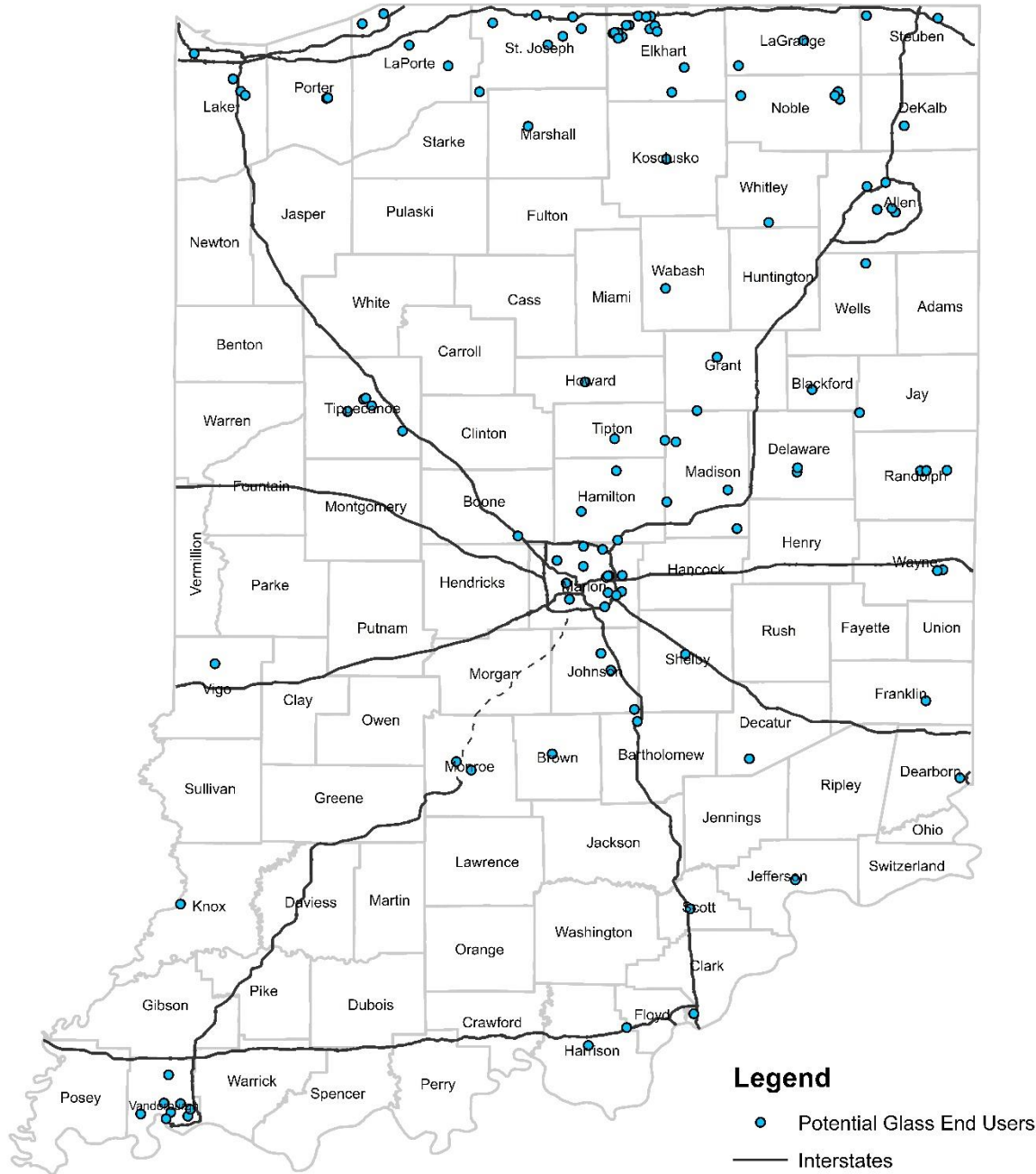
*Glass Materials***Table 2C-1 Glass NAICS Codes Used in Analysis**

Material	NAICS	Description
Glass	327211	Flat Glass Manufacturing
	327212	Other Pressed & Blown Glass & Glassware Manufacturing
	327213	Glass Container Manufacturing
	327215	Glass Product Manufacturing Made of Purchased Glass
	327993	Insulating batts, fills, or blankets, fiberglass, manufacturing

**Map 2C-1** shows the businesses which reported at least one of the NAICS codes listed in **Table 2C-1**. These are potential glass end users, but it is unconfirmed if the businesses use recycled materials or not.

## Map 2C-1 Potential Glass End User/Processors

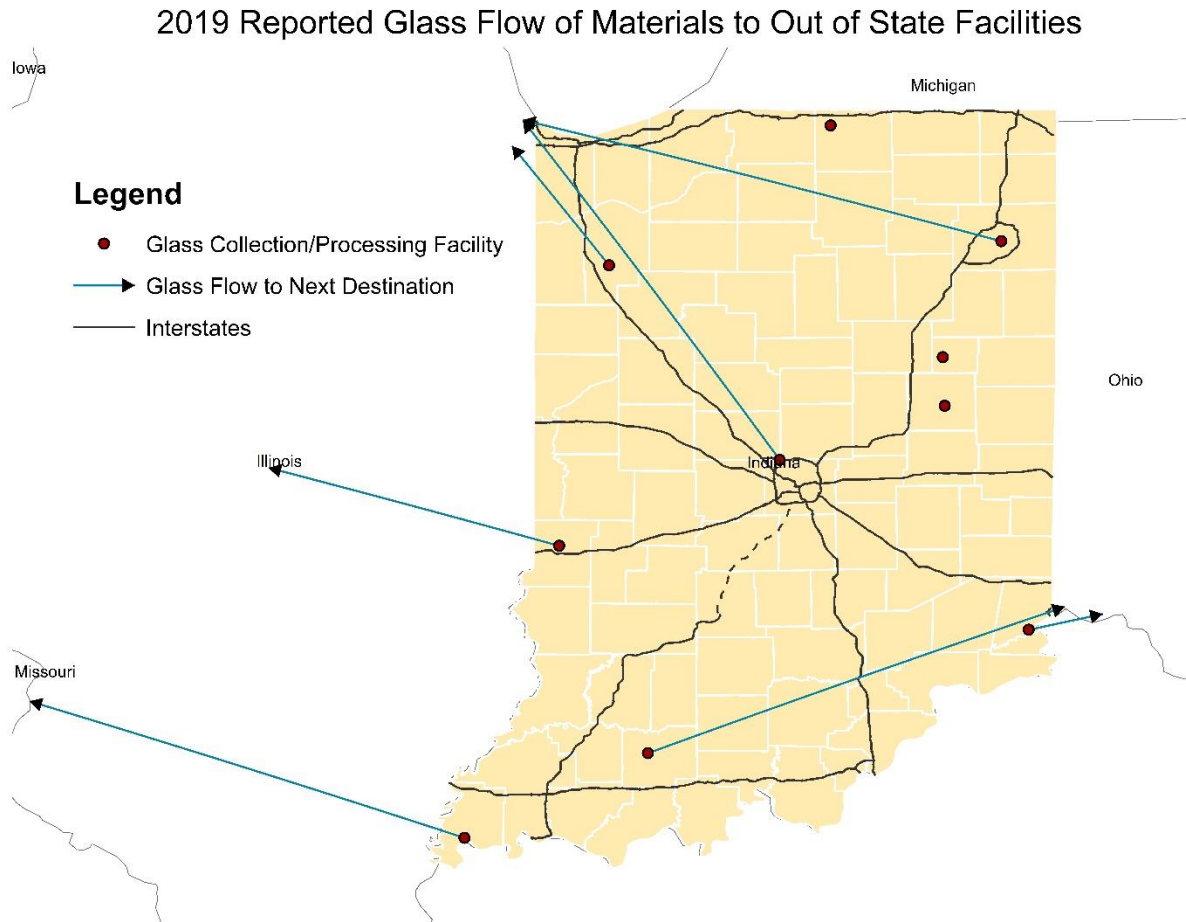
### Potential Glass End Users in Indiana



**Map 2C-2** shows reported material flow for glass from locations inside Indiana to out-of-state facilities. In-state flows were not mapped since those already assist in-state commerce. The arrows show from origin facility to the out-of-state destination.



## Map 2C-2 Glass Flow Out of State



An additional flow which is not located on the map above is the Dayton Glass Plant in Dayton, Ohio. Many MRF's have shared that they send glass to be processed at this plant, but this was not reported directly to IDEM. Some glass shipments to the Dayton facility may get reported by state destination as sent to manufacturers/end users. This plant cleans and crushes glass into a usable form. Many glass end users will buy the clean, usable glass to make their products. Though conversations with these entities, recyclable glass is shipped from Indiana collection facilities to Dayton to be processed and then shipped back into Indiana to an end user. Shipments of recyclables to manufacturers/end users in Re-TRAC are listed by state destination. They do not specify the actual company.

*Metals Materials*

Table 2C-2 Metals NAICS Codes Used in Analysis

Material	NAICS	Description
Metal	331110	Iron & Steel Mills & Ferroalloy Manufacturing
	331210	Iron & Steel Pipe & Tube Manufacturing from Purchased Steel

Material	NAICS	Description
	331221	Rolled Steel Shape Manufacturing
	331318	Other Aluminum Rolling Drawing & Extruding
	331410	Nonferrous Metal (Except Aluminum) Smelting/Rfng
	331420	Copper Rolling, Drawing, Extruding & Alloying
	331491	Nonferrous Metal (Exc CU & Al) Rllng/Drwng/Extrdng
	331523	Nonferrous Metal Die-Casting Foundries
	331529	Other Nonferrous Metal Foundries (Exc Die-Casting)
	332111	Iron & Steel Forging
	332112	Nonferrous Forging
	332114	Custom Roll Forming
	332117	Powder Metallurgy Part Manufacturing
	332119	Metal Crown/Closure/Other Metal Stmpng (Exc Auto)
	332215	Metal Ktchn Ckwr/Utnsl/Ctlry/Fltwr (Exc Prcs) Manufacturing
	332216	Saw Blade & Handtool Manufacturing
	332311	Prefabricated Metal Building & Component Manufacturing
	332312	Fabricated Structural Metal Manufacturing
	332313	Plate Work Manufacturing
	332321	Metal Window & Door Manufacturing
	332322	Sheet Metal Work Manufacturing
	332323	Ornamental & Architectural Metal Work Manufacturing
	332410	Power Boiler & Heat Exchanger Manufacturing
	332420	Metal Tank (Heavy Gauge) Manufacturing
	332431	Metal Can Manufacturing
	332439	Other Metal Container Manufacturing
	332510	Hardware Manufacturing
	332613	Spring Manufacturing
	332618	Other Fabricated Wire Product Manufacturing
	332710	Machine Shops
	332721	Precision Turned Product Manufacturing
	332722	Bolt, Nut, Screw, Rivet & Washer Manufacturing
	332811	Metal Heat Treating
	332812	Metal Coating & Non-Precious Engraving
	332813	Electroplating Plating Polishing Anodizing & Clrng
	332911	Industrial Valve Manufacturing
	332912	Fluid Power Valve & Hose Fitting Manufacturing
	332913	Plumbing Fixture Fitting & Trim Manufacturing
	332919	Other Metal Valve & Pipe Fitting Manufacturing
	332991	Ball & Roller Bearing Manufacturing
	332992	Small Arms Ammunition Manufacturing
	332993	Ammunition (Except Small Arms) Manufacturing
	332994	Small Arms, Ordnance, & Ordnance Accessories Manufacturing
	332996	Fabricated Pipe & Pipe Fitting Manufacturing

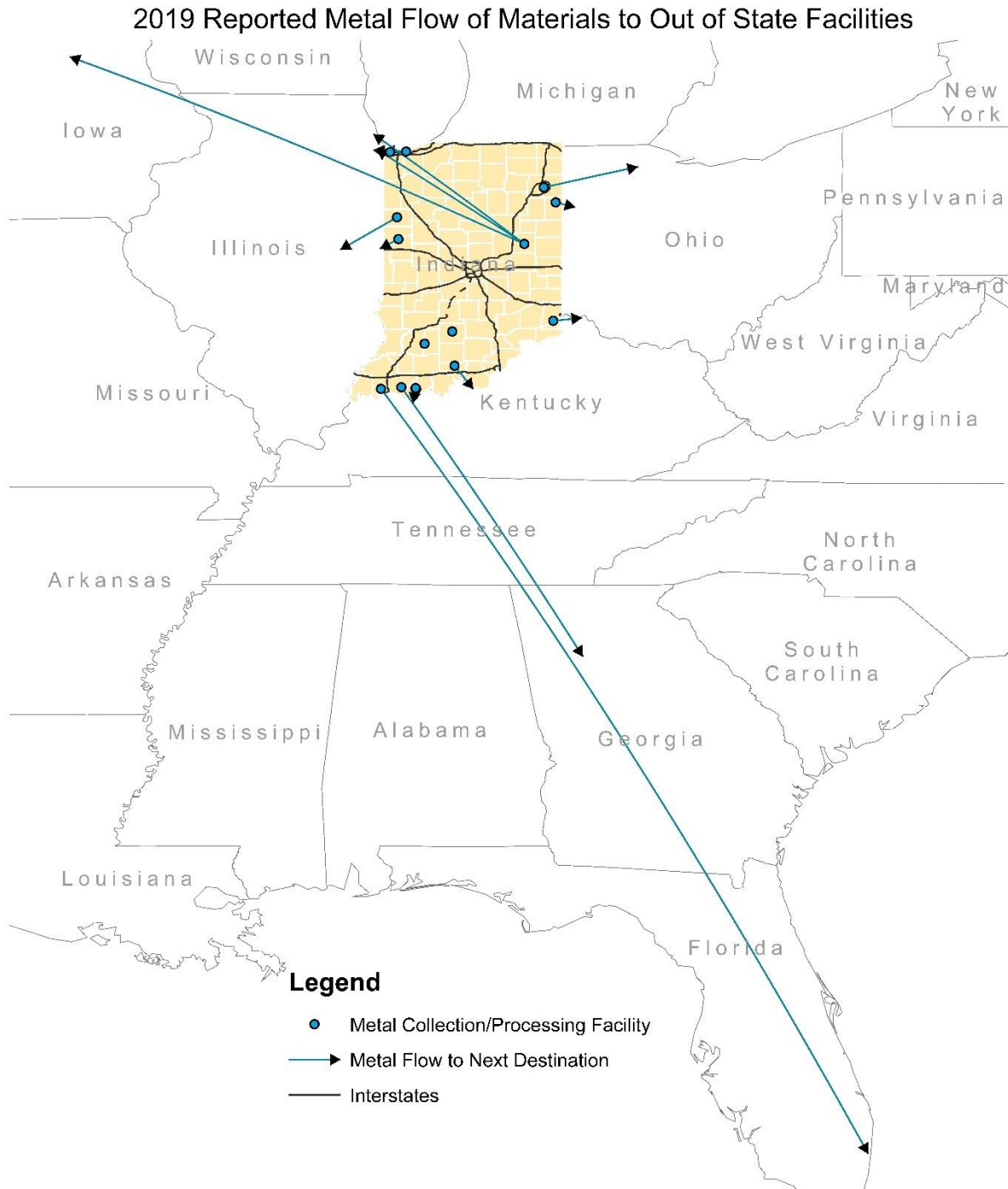


Material	NAICS	Description
	332999	All Other Misc Fabricated Metal Product Manufacturing
	333514	Special Die & Tool, Die Set, Jig & Fixture Manufacturing
	333515	Cutting Tool & Machine Tool Accessory Manufacturing
	333517	Machine Tool Manufacturing
	333519	Rolling Mill & Other Metalworking Machinery Manufacturing
	333611	Turbine & Turbine Generator Set Units Manufacturing
	333612	Speed Changer, Indl High-Speed Drive & Gear Manufacturing
	333613	Mechanical Power Transmission Equipment Manufacturing
	333618	Other Engine Equipment Manufacturing
	333997	Scale & Balance Manufacturing
	333999	All Other Misc General Purpose Machinery Manufacturing
	335210	Small Electrical Appliance Manufacturing
	335220	Major Household Appliance Manufacturing
	331314	Secondary Smelting and Alloying of Aluminum
	331315	Aluminum Sheet, Plate, and Foil Manufacturing
	331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)
	331511	Iron Foundries
	331512	Steel Investment Foundries
	331513	Steel Foundries (except Investment)
	331524	Aluminum Foundries (except Die-Casting)
	333511	Industrial Mold Manufacturing
	335221	Household Cooking Appliance Manufacturing
	335222	Household Refrigerator and Home Freezer Manufacturing
	335224	Household Laundry Equipment Manufacturing
	335228	Other Major Household Appliance Manufacturing

**Map 2C-3** shows the businesses which reported at least one of the NAICS codes listed in **Table 2C-2**. These are potential metal end users, but it is unconfirmed if the businesses use recycled materials or not.



Map 2C-4 2019 Metal Flow (Ferrous and Non-Ferrous Metals) Out of State



*Fiber Materials***Table 2C-3 NAICS Codes Used in Fiber Analysis**

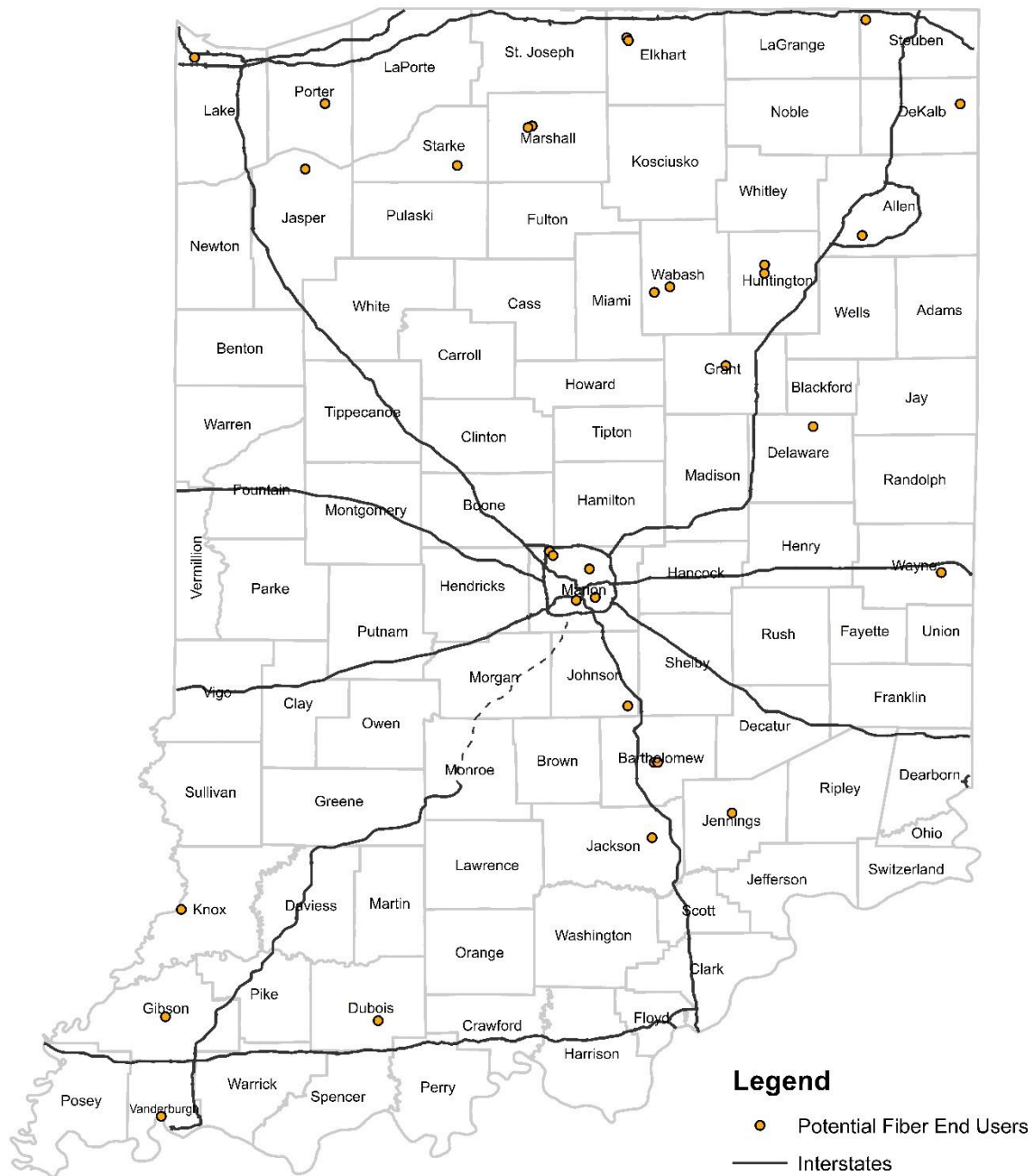
Material	NAICS	Description
Fiber	322211	Corrugated & Solid Fiber Box Manufacturing
	322212	Folding Paperboard Box Manufacturing
	322219	Other Paperboard Container Manufacturing
	322121	Paper (Except Newsprint) Mills
	322220	Paper Bag & Coated & Treated Paper Manufacturing
	322230	Stationery Product Manufacturing
	322291	Sanitary Paper Product Manufacturing
	322299	All Other Converted Paper Product Manufacturing
	322110	Pulp Mills
	322122	Newsprint Mills

**Map 2C-5** shows the businesses which reported at least one of the NAICS codes listed in **Table 2C-3**. These are potential fiber end users, but it is unconfirmed if the businesses use recycled materials or not.



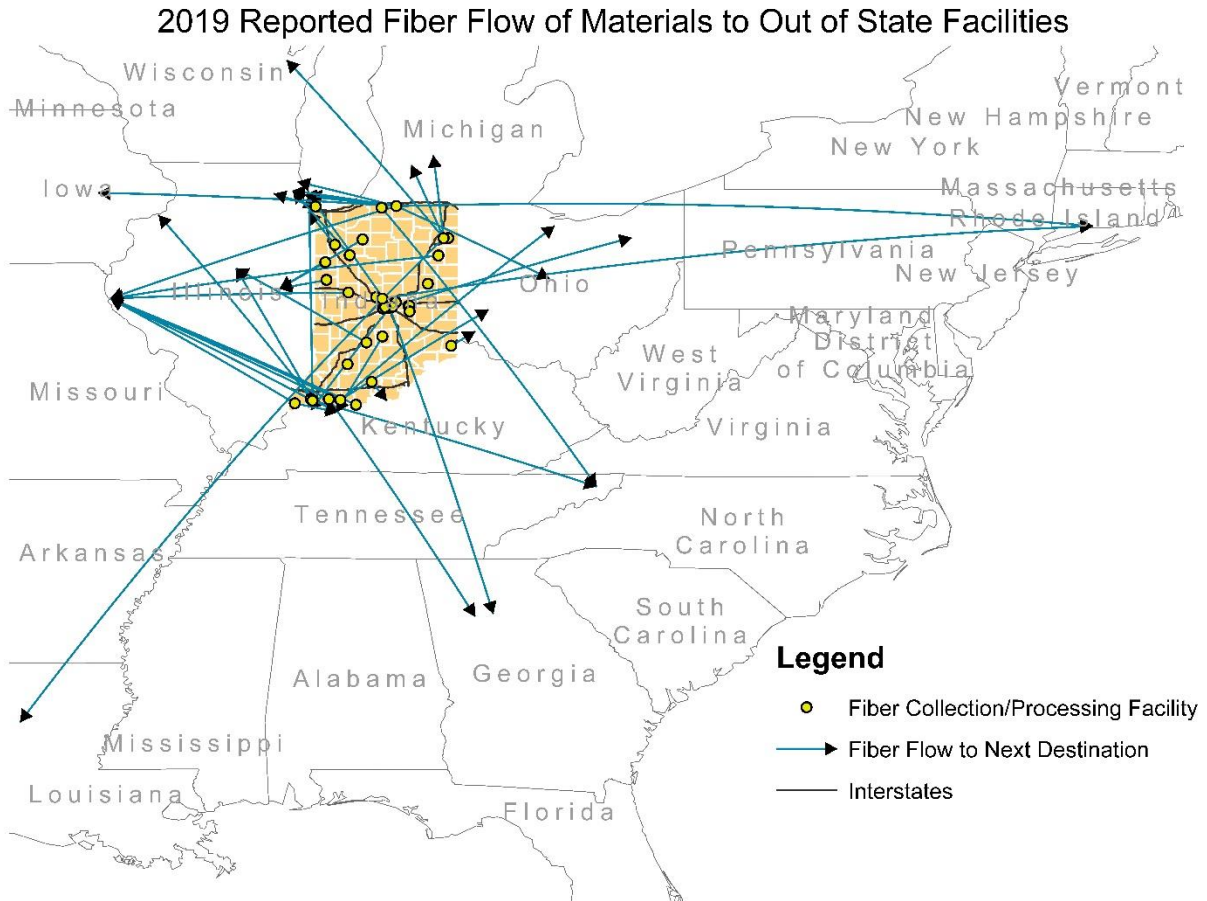
## Map 2C-5 Potential Fiber End User/Processors

### Potential Fiber End Users in Indiana



The following map shows reported material flow for fiber from locations inside Indiana to out-of-state facilities. In-state flows were not mapped since those already assist in-state commerce. The arrows show from origin facility to the out-of-state destination.

**Map 2C-6 2019 Fiber Flow Out of State**



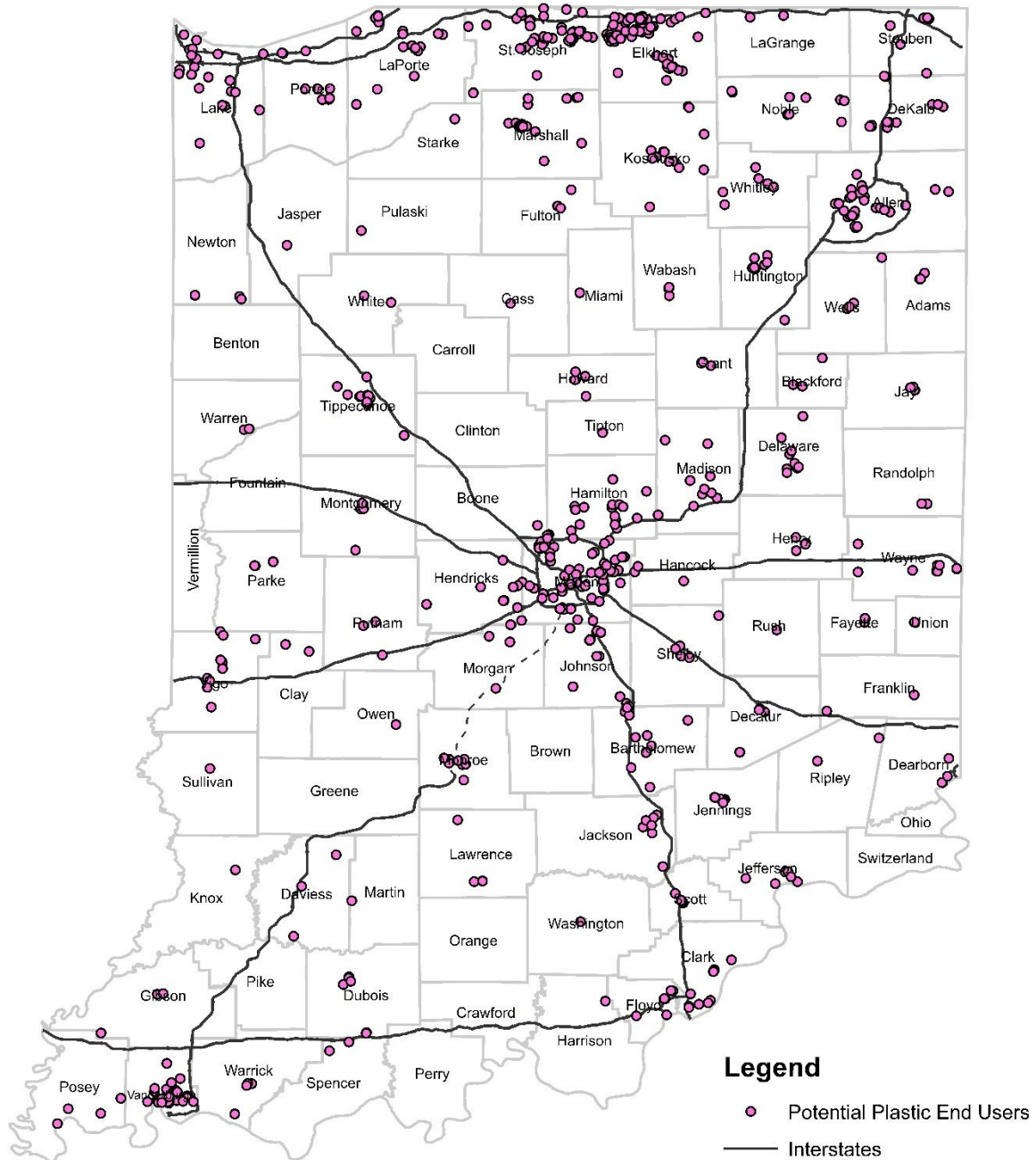
*Plastic Materials***Table 2C-4 NAICS Codes Used in Plastic Analysis**

Material	NAICS	Description
Plastics	325211	Plastics Material & Resin Manufacturing
	325212	Synthetic Rubber Manufacturing
	325220	Artificial & Synthetic Fibers & Filaments Manufacturing
	326113	Unlaminated Plastics Film/Sheet (Except Pkgng) Manufacturing
	326150	Urethane & Other Foam Prod (Exc Polystyrene) Manufacturing
	326199	All Other Plastics Product Manufacturing
	424610	Plastics Materials/Basic Forms/Shps Mrchnt Whlsrs
	325991	Custom Compounding of Purchased Resins
	326111	Plastics Bag and Pouch Manufacturing
	326112	Plastics Packaging Film and Sheet (including Laminated) Manufacturing
	326121	Unlaminated Plastics Profile Shape Manufacturing
	326122	Plastics Pipe and Pipe Fitting Manufacturing
	326130	Laminated Plastics Plate, Sheet (except Packaging), and Shape Manufacturing
	326140	Polystyrene Foam Product Manufacturing
	326160	Plastics Bottle Manufacturing
	326191	Plastics Plumbing Fixture Manufacturing
	326211	Tire Manufacturing (except Retreading)
	326220	Rubber and Plastics Hoses and Belting Manufacturing

**Map 2C-7** shows the businesses which reported at least one of the NAICS codes listed in **Table 2C-4**. These are potential metal end users, but it is unconfirmed if the businesses use recycled materials or not.

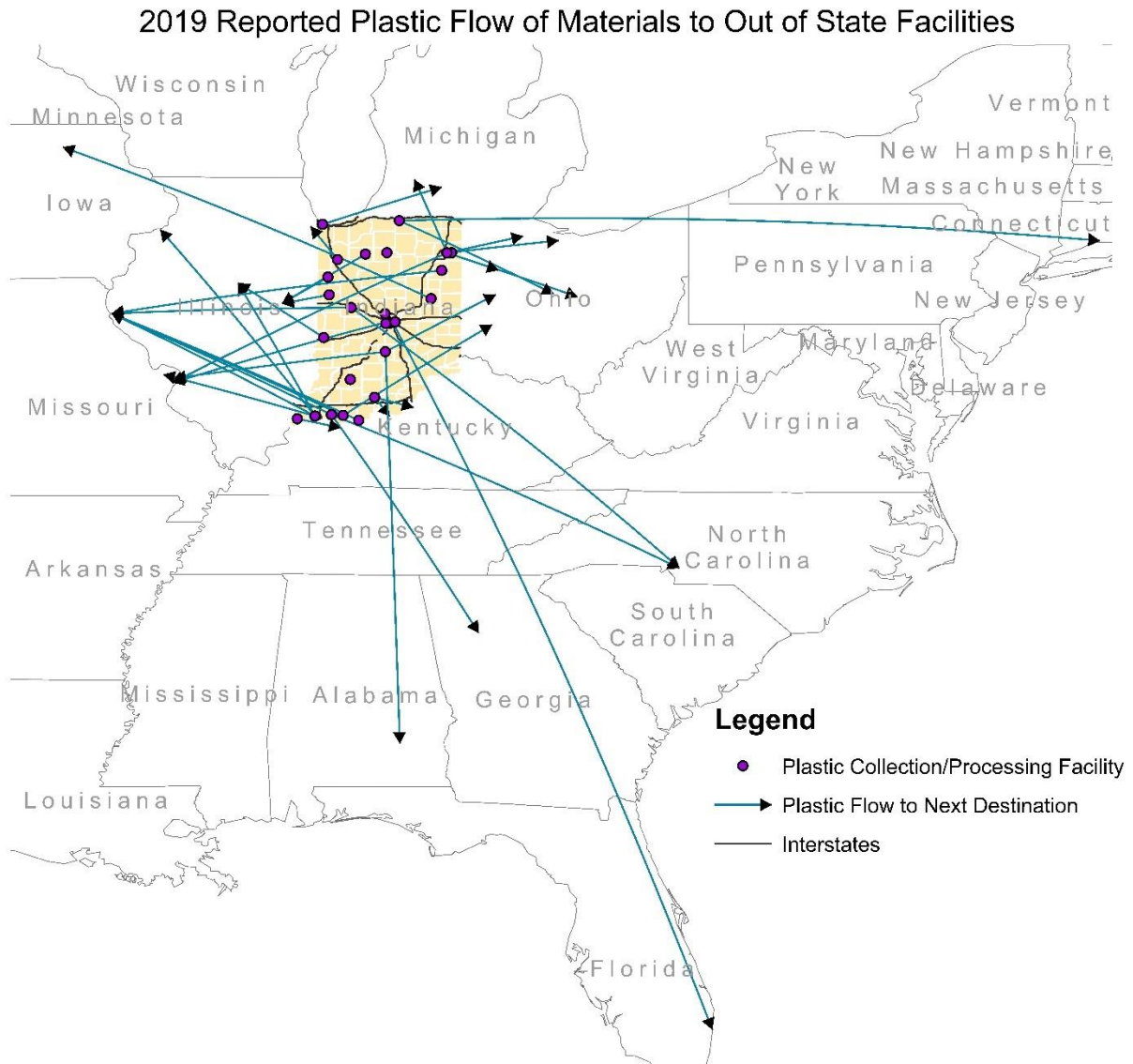
Map 2C-7 Potential Plastic End User/Processors

Potential Plastic End Users in Indiana



The following map shows reported material plastic for glass from locations inside Indiana to out-of-state facilities. In-state flows were not mapped since those already assist in-state commerce. The arrows show from origin facility to the out-of-state destination.

**Map 2C-8 2019 Plastic Flow Out of State**



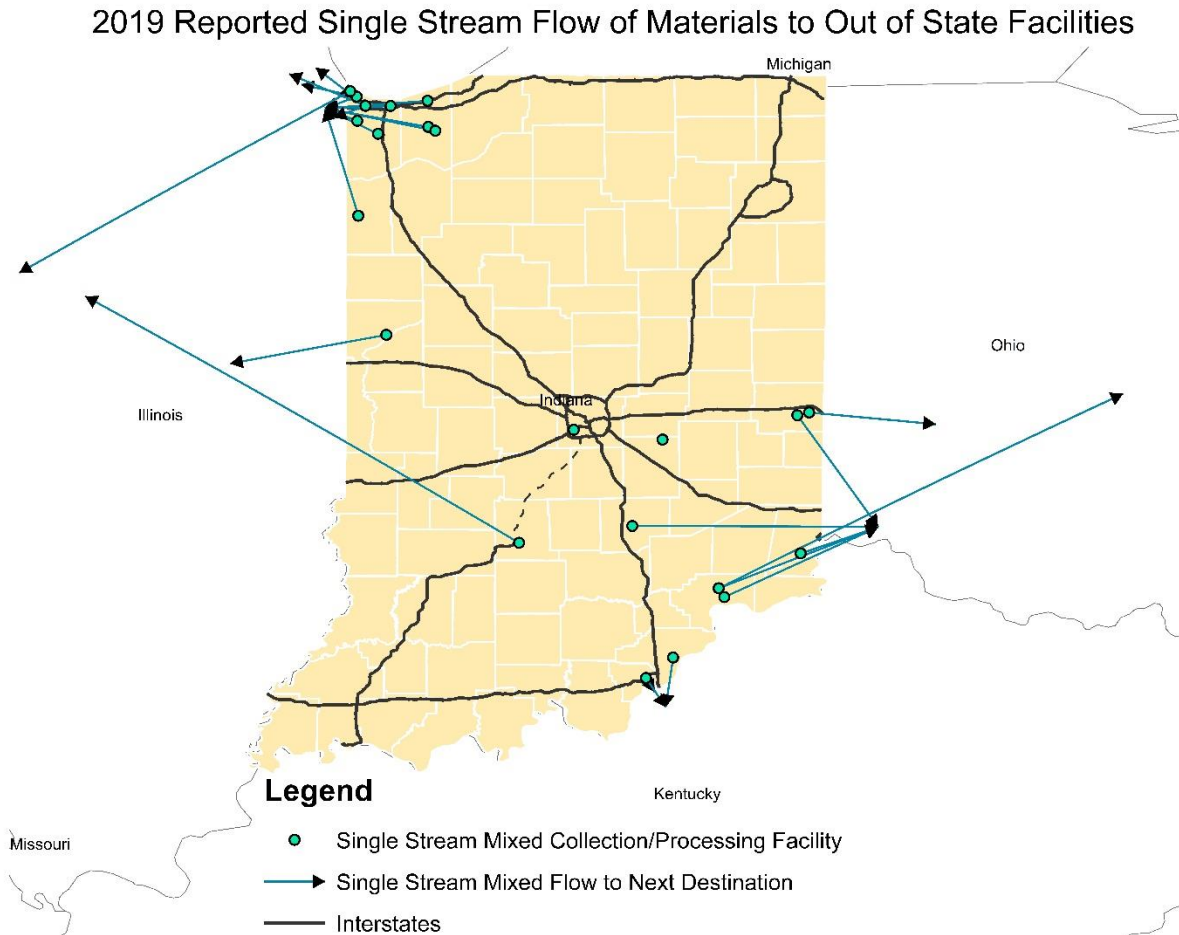
### *Single Stream Mixed Materials*

Single stream materials do not have specific NAICS codes, but materials reported by facilities to have transported single stream mixed materials were mapped to provide the flows of these materials. In-state flows were not mapped since those already assist in-state commerce. The arrows show from origin facility to the out-of-state destination.



For potential single stream mixed material facilities, see map on MRFs below.

### Map 2C-9 2019 Single Stream Mixed Materials Flow Out of State



### Total Economic Contribution of Companies that May Potentially Use Recycled Materials

This section of the Study focuses on estimating the economic value of the total economic contribution of companies that may potentially use recycled commodities. Listed types of facilities may use 0 tons of recycled materials, while other facilities may use different ratios of recycled materials versus virgin materials used as feedstock.

#### Glass

Because recycled glass is only a portion of the materials and labor used by those companies as feedstock to produce their finished product, the aggregate impact of the companies that use recycled glass is much greater than the portion contributed by recycled glass. It is estimated that the total economic contribution of companies that use recycled glass as part of their production process is nearly \$1.5 billion and nearly 6,400 jobs are created (**Table 2C-5**).



**Table 2C-5: Total Economic Contribution of Companies that Potentially Use Recycled Glass**

	Direct	Indirect and Induced	Total
<b>Employment</b>	4,433	4,685	9,118
<b>Employee Compensation</b>	\$296,926,230	\$273,114,134	\$570,040,364
<b>Value Added</b>	\$507,056,692	\$471,031,228	\$978,087,920
<b>Output</b>	\$1,656,243,626	\$902,469,577	\$2,558,713,203

**Table 2C-6** displays the economic sectors of Indiana's economy impacted most by companies that used recycled glass as part of their production process (industry total output) and the value of the recycled commodity's share of that contribution (commodity output). Many of the impacts are associated with employee spending.

**Table 2C-6: Economic Sectors Impacted Most by Potential Use of Recycled Glass Commodity**

	Industry Total Output	Commodity Output
<b>Glass product manufacturing made of purchased glass</b>	\$886,610,004	\$1,244,330
<b>Retail - Miscellaneous store retailers</b>	\$1,644,605,482	\$941,656
<b>Wholesale - Other durable goods merchant wholesalers</b>	\$6,919,593,454	\$430,761
<b>Other real estate</b>	\$24,827,440,841	\$226,303
<b>Truck transportation</b>	\$11,357,044,515	\$200,465
<b>Owner-occupied dwellings</b>	\$26,769,809,599	\$118,443
<b>Hospitals</b>	\$22,315,077,968	\$91,571
<b>Wholesale - Wholesale electronic markets/agents/brokers</b>	\$1,244,162,468	\$80,056
<b>Electric power transmission and distribution</b>	\$8,648,620,477	\$65,242
<b>Management of companies and enterprises</b>	\$8,349,963,031	\$64,154

### *Non-ferrous Metal*

While recycled non-ferrous materials are a relatively small contributor to the production process, they do support companies that employ over 48,000 workers and over 120,000 spin-off jobs (**Table 2C-7**).

**Table 2C-7: Total Economic Contribution of Companies Potentially Using Recycled Non-ferrous Metal**

	Direct	Indirect & Induced	Total
<b>Employment</b>	48,085	120,179	168,264
<b>Employee Compensation</b>	\$4,222,284,309	\$7,116,336,650	\$11,338,620,959
<b>Value Added</b>	\$12,022,927,962	\$11,374,663,158	\$23,397,591,120
<b>Output</b>	\$47,991,245,836	\$22,509,790,461	\$70,501,036,297

Non-ferrous foundries, trucking companies, and utilities are the sectors most impacted by companies that use recycled non-ferrous metal. Employee and spin-off employee spending contributes to a robust retail and real estate economy (**Table 2C-8**).

**Table 2C-8: Economic Sectors Most Impacted by Potential Use of Recycled Non-ferrous Metal**

	Industry Total Output	Commodity Output
Nonferrous metal foundries	\$1,162,137,692	\$572,328
Retail - Building material and garden equipment and supplies stores	\$3,380,068,102	\$287,773
Wholesale - Other durable goods merchant wholesalers	\$6,919,593,454	\$55,204
Other real estate	\$24,827,440,841	\$43,995
Owner-occupied dwellings	\$26,769,809,599	\$34,409
Truck transportation	\$11,357,044,515	\$29,357
Hospitals	\$22,315,077,968	\$26,588
Electric power transmission and distribution	\$8,648,620,477	\$22,243
Employment services	\$8,731,181,632	\$20,547
Monetary authorities and depository credit intermediation	\$8,720,629,054	\$17,429

#### *Ferrous Metal*

In addition to the nearly \$25 billion of economic activity produced by companies using recycled ferrous metal, the companies generate nearly 98,000 direct and spinoff jobs and over \$6 billion of employee compensation (**Table 2C-9**).

**Table 2C-9: Total Economic Contribution of Companies Potentially Using Recycled Ferrous Metal**

	Direct	Indirect & Induced	Total
Employment	48,085	49,877	97,962
Employee Comp	\$3,602,507,198	\$2,809,945,195	\$6,412,452,393
Value Added	\$6,843,376,910	\$4,701,325,934	\$11,544,702,844
Output	\$15,817,279,288	\$9,071,139,380	\$24,888,418,668

Ferrous metal companies using recycled steel impact a wider range of industry spending-related economic sectors including rail and truck transport as well as ferrous and non-ferrous foundries. Employee spending remains an important contributor to the real estate and health care sectors (**Table 2C-10**).

**Table 2C-10: Economic Sectors Most Impacted by Potential Use of Recycled Ferrous Metal**

	Industry Total Output	Commodity Output
<b>Ferrous metal foundries</b>	\$1,754,856,756	\$953,001
<b>Wholesale - Other durable goods merchant wholesalers</b>	\$6,919,593,454	\$44,917
<b>Owner-occupied dwellings</b>	\$26,769,809,599	\$27,507
<b>Truck transportation</b>	\$11,357,044,515	\$25,637
<b>Electric power transmission and distribution</b>	\$8,648,620,477	\$25,607
<b>Iron and steel mills and ferroalloy manufacturing</b>	\$24,122,020,000	\$25,237
<b>Hospitals</b>	\$22,315,077,968	\$21,254
<b>Other real estate</b>	\$24,827,440,841	\$19,296
<b>Rail transportation</b>	\$2,556,713,860	\$16,816
<b>Nonferrous metal foundries</b>	\$1,162,137,692	\$15,405

*Fiber*

Companies using recycled fiber contribute approximately 10,000 direct and 20,000 total jobs to Indiana's economy. While their collective economic impact is not as large as the ferrous and non-ferrous metal industry, jobs from companies using recycled fiber add over \$5 billion of economic output to the economy each year (**Table 2C-11**).

**Table 2C-11: Total Economic Contribution of Companies Potentially Using Recycled Fiber**

	Direct	Indirect & Induced	Total
<b>Employment</b>	10,114	10,678	20,792
<b>Employee Comp</b>	\$710,603,570	\$615,931,746	\$1,326,535,316
<b>Value Added</b>	\$900,286,585	\$996,308,197	\$1,896,594,782
<b>Output</b>	\$3,186,610,210	\$1,902,357,963	\$5,088,968,173

While employee spending continues to impact the retail, real estate, and health care industry sectors, companies using recycled fiber, in a circular fashion, add nearly \$500,000 of economic activity to glass manufacturers (see the tenth most impacted industry) **Table 2C-12**.

**Table 2C-12: Economic Sectors Most Impacted by Potential Use of Recycled Fiber**

	Industry Total Output	Commodity Output
<b>All other converted paper product manufacturing</b>	\$126,288,323	\$7,998,349
<b>Retail - General merchandise stores</b>	\$4,860,370,756	\$5,856,955
<b>Wholesale - Other nondurable goods merchant wholesalers</b>	\$5,607,472,611	\$1,196,101
<b>Other real estate</b>	\$24,827,440,841	\$862,028
<b>Truck transportation</b>	\$11,357,044,515	\$835,136
<b>Management of companies and enterprises</b>	\$8,349,963,031	\$629,755
<b>Owner-occupied dwellings</b>	\$26,769,809,599	\$617,231

	Industry Total Output	Commodity Output
<b>Warehousing and storage</b>	\$5,093,684,423	\$485,973
<b>Glass product manufacturing made of purchased glass</b>	\$842,647,989	\$484,971

### Plastic

Companies using recycled plastics generated in Indiana add over \$14.5 billion to the economy and generate over 32,000 direct and almost 61,000 total jobs to the economy (Table 2C-13).

**Table 2C-13: Total Economic Contribution of Companies Potentially Using Recycled Plastics**

	Direct	Indirect & Induced	Total
<b>Employment</b>	32,713	28,194	60,907
<b>Employee Comp</b>	\$1,962,884,793	\$1,591,704,543	\$3,554,589,336
<b>Value Added</b>	\$2,706,905,844	\$2,677,559,071	\$5,384,464,915
<b>Output</b>	\$9,336,535,148	\$5,194,572,119	\$14,531,107,267

Retail, real estate, and health care continue to be the economic sectors most impacted by employee spending. Similarly, the transportation and utility sectors are the non-manufacturing sectors of Indiana's economy most impacted by companies that use recycled plastics (Table 2C-14).

**Table 2C-14: Economic Sectors Most Impacted by Potential Use of Recycled Plastics**

	Industry Total Output	Commodity Output
<b>Other plastics product manufacturing</b>	\$6,287,808,760	\$2,237,010
<b>Retail - Miscellaneous store retailers</b>	\$1,644,605,482	\$1,178,168
<b>Wholesale - Other nondurable goods merchant wholesalers</b>	\$5,607,472,611	\$303,527
<b>Other real estate</b>	\$24,827,440,841	\$270,543
<b>Owner-occupied dwellings</b>	\$26,769,809,599	\$135,279
<b>Hospitals</b>	\$22,315,077,968	\$104,589
<b>Truck transportation</b>	\$11,357,044,515	\$96,113
<b>Electric power transmission and distribution</b>	\$8,648,620,477	\$87,594
<b>Management of companies and enterprises</b>	\$8,349,963,031	\$70,875
<b>Warehousing and storage</b>	\$5,093,684,423	\$63,677

### Organics

Organic material is primarily collected and then transported by local communities to their residents at zero or nominal costs. Thus, its primary function is to serve as a replacement for mulch, compost, and other commercially available organic material. As a result, while input-output modeling suggests that the use of recycled organic material

adds an average of nearly \$10,000 to Indiana's economy, most of that is value added to residents rather than a manufacturing process. Because mulch and compost are in theory free to be used by residents, it frees up money to be spent or invested in other items and services. See **Table 2C-15** for organics economic contribution.

**Table 2C-15: Total Economic Contribution of Companies Potentially Using Recycled Organics**

	High	Low	Average
<b>Employment</b>	49	5	27
<b>Employee Comp</b>	\$3,783,691	\$354,721	\$2,069,206
<b>Value Added</b>	\$5,932,284	\$556,152	\$3,244,218
<b>Output</b>	\$17,183,812	\$1,610,982	\$9,397,397

#### D. INCREASED DEMAND BASED ON SURVEY RESPONSES

There are two ways to increase the economic contribution of recycling in Indiana. The first is to increase the quantity of recycled materials collected, sorted, and processed in Indiana. This would lead to growth in employment (and possibly the creation of new firms) in the recycling industry itself. The second would be a potential increase in production by Indiana companies using recyclables provided in Indiana as part of their production/manufacturing process. This would increase the value of recycled commodities contribution to the manufacturing process and provide a modest boost in the impact of the industries.

##### Increase Supply of Recyclables in the Indiana Economy

Just under 50% (10/21) of survey respondents suggested they would use more recyclables produced in Indiana if available. This increase in supply could be caused in two manners: by increasing the capture rate of recyclables in Indiana or decreasing the amount of material exported out of state. If this supply and demand increased, there would be a nearly 22% increase in the tons of recycled material to be collected, sorted, and processed within Indiana. A 22% increase in the volume of recyclables would increase direct jobs in the recycling industry by 922 and lead to an increase of over \$376 million in economic activity (**Table 2D-1**).

**Table 2D-1 Economic Contribution of Demand-Based Increase in Recycling Tonnage**

	Direct	Indirect & Induced	Total
<b>Employment</b>	922	927	1,850
<b>Employee Comp</b>	\$61,145,014	\$50,257,064	\$111,402,077
<b>Value Added</b>	\$127,217,550	\$84,173,283	\$211,390,833
<b>Output</b>	\$224,337,518	\$152,359,325	\$376,696,843

When combined with the current level of economic contribution of the recycling industry, the total economic contribution of the industry would increase to over 5,100 direct jobs and a total economic contribution of over \$2.1 billion (**Table 2D-2**).

**Table 2D-2: Potential Total Economic Impact of Recycling Industry with Increased Demand**

	Direct	Indirect & Induced	Total
<b>Employment</b>	5,177	5,205	10,383
<b>Employee Comp</b>	\$343,205,470	\$282,091,672	\$625,297,141
<b>Value Added</b>	\$714,069,004	\$472,462,581	\$1,186,531,585
<b>Output</b>	\$1,259,201,014	\$855,189,173	\$2,114,390,187

While it could be argued that recycling is the right thing to do socially and environmentally, there is a clear economic incentive to grow the industry. In Indiana, a 10% increase in the amount of recyclables would grow 426 direct new jobs at recycling companies, add 428 more spin-off jobs attributable to new employee spending, and increase business investment. Every 10% increase in recyclables would add nearly \$174 million of new economic activity to Indiana's economy (**Table 2D-3**).

**Table 2D-3: Economic Impact of a 10% Increase in Recycling Tons**

	Direct	Indirect & Induced	Total
<b>Employment</b>	426	428	853
<b>Employee Comp</b>	\$28,206,046	\$23,183,461	\$51,389,506
<b>Value Added</b>	\$58,685,145	\$38,828,930	\$97,514,075
<b>Output</b>	\$103,486,350	\$70,282,985	\$173,769,334

### Increased Output Attributable to Recycled Material

While nearly 50% of the survey respondents indicated that they would use more recyclable material produced in Indiana if available, only 14.2% indicated they would increase their output. However, not enough data was collected about how large of an increase in production might occur. As a chosen factor for example, a 10% increase would be estimated to add an average of 29 new jobs to the commodities contribution to the manufacturing process for all recyclables categories, increase employee compensation by over \$1.3 million, and add over \$4.2 million total to the economy (**Table 2D-4**).

**Table 2D-4: Estimated 10% Increase in Manufacturing Attributable to the Use of Recyclable Commodities**

	High	Low	Average
<b>Employment</b>	40	18	29
<b>Employee Comp</b>	\$1,833,741	\$834,063	\$1,304,212
<b>Value Added</b>	\$2,779,595	\$1,263,910	\$1,976,794
<b>Output</b>	\$5,936,182	\$2,706,262	\$4,224,347



## E. TAX REVENUE GENERATED FROM THE RECYCLING ECONOMY

IMPLAN estimates the taxes generated at the city, town, county, and state level for a range of taxes as follows.

At the county level, IMPLAN includes:

- Local sales (food and beverage)
- Property
- Local income
- Motor vehicle
- Severance

At the city and town level, IMPLAN estimates, the following taxes (or distribution of taxes):

- Property
- Local income
- Motor vehicle
- Severance

At the state level, IMPLAN estimates:

- Personal income
- Sales
- Severance
- Corporate profits

There are three key tax impacts derived from recycling. The first contribution are the taxes generated by recycling activities including collecting and processing recycled material. **Table 2E-1** shows the tax impact of the recycling companies and their employees.

The second tax impact are the taxes attributable to recycled commodities used by other non-recycling companies.

The third is the complete tax contribution of companies using recycled materials as part of their production process. The total tax contribution of recycling activities to Indiana, and its cities, towns and counties is estimated to be \$131,654,787 (**Table 2E-1**).

**Table 2E-1 Tax Contribution Recycling Activities**

Jurisdiction	Amount
County	\$12,650,319
Cities and Towns	\$19,180,665
State	\$99,823,803
<b>Total</b>	<b>\$131,654,787</b>

The use of recycled commodities is an additional tax impact of recycling. From the commodity perspective, it is an estimate of the commodity's share of a bigger process, for example recycled plastic may be used in the production of plastic bottles, the recycled material is merely one of many inputs to the production process. A commodity perspective identifies the share of economic activity and taxes attributable to the recycled product.

Based on the range of values used to estimate the economic contribution of recycled commodities the total tax contribution of commodities as used in production process ranges from a high of over \$2.5 million to a low of over \$1.2 million (**Table 2E-2**).

**Table 2E-2 Tax Contribution Commodity Inputs**

Jurisdiction	High	Low	Mean
County	\$237,864	\$114,923	\$176,324
Cities and Towns	\$356,079	\$172,114	\$263,996
State	\$1,964,262	\$946,824	\$1,454,884
Total	\$2,558,204	\$1,233,862	\$1,895,204

Companies that use recycled commodities as an input to their production process are primarily engaged in a wide range of manufacturing efforts. The total tax contribution of companies using recycled material as part of the manufacturing process exceed \$2.2 billion dollars. The State of Indiana receives the largest impact of nearly \$1.7 billion.

**Table 2E-3 Tax Contribution End Users**

Jurisdiction	Amount
County	\$233,666,608
Cities and Towns	\$289,008,779
State	\$1,695,845,806
Total	\$2,218,520,593

## F. COMPARISON TO INSTITUTE OF SCRAP RECYCLING INDUSTRIES (ISRI)

In 2019, the Institute of Scrap Recycling Industries (ISRI) issued their Economic Impact Study for the US-based scrap recycling industry. The study also used the IMPLAN model with 2018 recycling data.

**Table 2F-1** compares the ISRI Economic Impact Study for the State of Indiana to the economic projections for this study. Because the ISRI Economic Impact Study used 2018 data, the CPI rate of 2.3% was applied to normalize wages and economic impact for 2019.

While it is difficult to compare and reconcile the 2018 ISRI impact report with this study, the total economic impact is within 1%. The IMPLAN model was used for both analysis but the input/output variables for the ISRI impact report could not be identified for a reasonable reconciliation or comparison.

**Table 2F-1. ISRI Direct Recycling Impacts (Adjusted to 2019)**

	ISRI	This Study	Difference	% Difference
<b>Jobs</b>	6,228	8,533	2,245	36%
<b>Wages</b>	\$406,749,608	\$513,895,064	\$107,145,456	26%
<b>Economic Impact</b>	\$1,757,237,585	\$1,737,693,344	\$19,544,241	1%

## PART 3. CONCLUSIONS AND RECOMMENDATIONS

This study conducted an extensive analysis of solid waste and recycling infrastructure and the economic impact of recycling. The recommendations are provided to help the State of Indiana continue to overcome barriers, increase recycling, and develop a more sustainable circular economy. Implementing each recommendation would require substantial discussion with stakeholders including legislators, processors, haulers, and political subdivisions to develop and implement the appropriate changes that will allow Indiana's material management system to thrive. The ultimate goals are to create a sustainable system that creates employment opportunities, incorporates new technologies, and rethinks how waste is managed and/or eliminated via a circular economy. The Ellen Macarthur Foundation defines the Circular Economy as follows:

*"A circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources. After defining what an economy actually is, this learning path explores the nuances of the concept of a circular economy, including the difference between biological and technical materials, the different opportunities that exist to keep materials and products in use, and the history of the idea. Finally, the benefits of shifting from a linear to a circular economy are highlighted."*

The following conclusions and recommendations should be used to stimulate discussions and actions to begin making high level changes to move Indiana in the direction of creating a circular economy. Moreover, these changes are necessary to increase recycling by approximately 2.7 million tons (if waste generation remains the same) to achieve the 50% recycling goal mandated by IC 13-20-25-1.

The first steps to consider in the development of a circular economy is to gain an understanding of the current materials management efforts in Indiana and identifying opportunities. Continual effort to collect important data and information is key to understanding changes in the system where the gaps are occurring.

### A. DATA COLLECTION

A circular economy is an economic system aimed at eliminating waste and the continuing the use of resources. Waste materials can be raw material inputs for other processes either as a component or recovered resource for another industrial process or as regenerative resources for nature (e.g., compost). This regenerative approach contrasts with the traditional linear economy which experts have defined as a "take, make, dispose" model of production.

This study focused on the solid waste, recycling, and compost elements of the Indiana circular economy. In particular, the study evaluated the current collection and processing infrastructure delivering raw material inputs for end user manufacturers in

Indiana. The study utilized existing recycling data collected by IDEM from recycling collectors and processors. Data was collected from surveys sent to Indiana solid waste districts, cities, and end users.

### End User Data

Obtaining recycling information from the end users is challenging but is the key to effectively manage and evaluate the circular economy in Indiana. The current system requires supply-side reporting of the processing of recyclables and the flow of recyclable materials to end users by state destination. This study connected with manufacturers that use waste materials as part of their product development process. Many reporting connections were made, and it is recommended that it would be beneficial to continue to build the reporting network to encourage manufacturers that completed survey reports to continue to provide this information annually.

IDEM's Solid Waste and Recycling Data Reporting Program requires recyclers to report data and provides tonnage information on the collection and processing of recyclables. End user recycling consumption is not part of the existing data collection system. A circular economy data collection system that can measure tonnages of recyclables throughout the process from collection to the end user is needed.

A data system that can effectively obtain and integrate end user data, when combined with the current system and a community data system, would, in effect, provide a complete data flow for materials from collection to processing and use by end users. A complete data management system that can measure the flow of material is a significant step towards a circular economy. This could also serve as a key component of solid waste planning for Indiana. Solid waste planning could use the data to upgrade the state and district solid waste plans and to move towards zero-waste as a statewide planning goal. Indiana should evaluate the technology and software that is currently available and develop a system that will enhance or complement the existing Re-TRAC reporting system.

All these factors presented in this section are important aspects to driving Indiana toward a sustainable recycling economy and to help state and local decision makers ensure they are basing their programmatic analysis and business decisions on sound information.

### *Recommendation A.1 End User & Processor Data Collection Outreach*

*Conduct stakeholder outreach with processors and end users to identify barriers and challenges to current data collection system and to identify potential improvements in data collection. Focus on key industries that use fiber, glass, metals, plastics, and organics.*

*Recommendation A.2 Develop Survey Process for End Users*

*Complete the data collection process for the recycling economy by developing a method to collect data on recycled materials used by end users. Collect data from in-state sources and out-of-state sources by type of material.*

**State of Indiana Data Collection**

Updates to the data collection system should be initiated and facilitated at the state level to obtain data that can be collected statewide and locally via municipalities and other political subdivisions or regionally by the solid waste districts. Having a consistent data collection system is a key factor to making economic decisions regarding investment in the circular economy. IDEM should reimagine the data collection requirements of materials management by working with Indiana manufacturers, solid waste operators and haulers, recycling facilities, institutions (schools, hospitals), major commercial entities, and Indiana solid waste districts.

Data collection must be consistent and provide decision-makers with information that will drive the improvements and changes to the materials management system. Requirements for data reporting must be clear. This is a key aspect that the state should lead and coordinate with the stakeholders identified above.

*Recommendation A.3 Enhance Current IDEM Solid Waste and Recycling Data Reporting Program Requirements for Disposal Facilities*

*Require landfills to report direct haul by county of origin and transferred tons separately*

- *Currently, disposal data are reported by permitted solid waste facilities in the state including MSW landfills, transfer stations, and waste-to-energy facilities.*
- *The reporting includes the origin (state and county), waste type (MSW, construction and demolition (C&D), foundry, coal ash, flue gas desulfurization (FGD) waste, and other), and amount of solid waste received.*
- *Transfer stations may receive solid waste from multiple counties for shipment to landfills, but landfills only report the location of the transfer station as the county origin.*

*Require transfer stations to report recycling and disposal tons by county of origin separately*

- *The recycling data is based upon shipments of recyclables by material type, destination, and amount which helps with the infrastructure analysis to avoid double counting.*
- *The reporting facility location is tracked as the origin of recyclables. Specifically, transfer stations submit quarterly Solid Waste Processing Facility Reports on how much solid waste is received by material type and origin as well as waste sent to final destinations for disposal or recovered for recycling.*



- *Transfer stations may also receive recyclables in a separate tipping area that does not get reported as solid waste. This is reported plus any recyclables recovered from the solid waste tipping area on the annual or quarterly Recycling Activity Report.*

*Report total disposal tons and recycling tons by county of origin*

*Recommendation A.4 Enhance IDEM Solid Waste and Recycling Data Reporting Program Requirements for Solid Waste Districts.*

*Currently, solid waste districts report only recycling tonnages from their collection infrastructure. The current data collection system should be enhanced to require the solid waste district to develop a complete data set on disposal, recycling, and diversion rate by connecting with third parties, private organizations, and local businesses to determine recycling tons not currently captured. This data set can be used to support planning and decisions at the state and solid waste district.*

### Community Data Collection and Reporting

A significant element in data collection is data from cities and solid waste districts. The community data collection for this study was moderately successful; however, this data should be collected annually with a focus by local solid waste district managers and IDEM to continually improve data quality and increase known quantities. This would be beneficial for all communities.

Investments in infrastructure and development of recycling feedstock capacity for end users is needed, and communities will benefit with increases in job opportunities and wages that accompany the investments. Communities should be encouraged through financial incentives to report data to fully participate in the economic development of the recycling economy. IDEM should expand the data collection responsibilities to communities and solid waste districts and could use the existing Re-TRAC platform to facilitate the annual data collection.

Communities reporting their disposal, recycling, and diversion data can provide valuable data for the solid waste districts and for benchmarking curbside programs. This data can be used to support solid waste district and statewide planning and allocation of funding.

A significant tool has been created by Emerge Knowledge, the developer of Re-TRAC Municipal Measurement Program (MMP). MMP is a data collection system designed specifically for municipalities and communities to record their recycling data. The data can be aggregated by solid waste districts and at the state level. The MMP program also allows participating communities to compare or benchmark their recycling statistics to other MMP communities. The Recycling Partnership currently requires cities to utilize the Re-TRAC MMP system to collect data on recycling if the community is awarded a recycling grant. Across the country,



approximately 500 communities currently use the Re-TRAC MMP system. In Indiana, there is currently no data system that cities use to accumulate recycling data. Two neighboring state environmental agencies Michigan (EGLE) and Ohio (OEPA) actively promote the use of the Re-TRAC MMP system.

*Recommendation A.5 Enhancements to IDEM Solid Waste and Recycling Data Reporting Program for Communities*

*Communities should take an active role in accumulating data on their recycling programs. Currently, IDEM encourages communities to report recyclables in the IDEM Solid Waste and Recycling Data program if services are contracted out, but the response is limited. Using a standardized system will allow for easy aggregation of data for solid waste districts and at the state level. Moreover, using a system that is compatible with the existing Re-TRAC system will allow for efficient integration as communities adopt the Re-TRAC MMP system. IDEM should consider this or another similar tool to make annual data collection part of the routine data collection and annual reporting requirements for solid waste districts and communities.*

## **B. MATERIALS MANAGEMENT PLANNING**

---

The State of Indiana and most of the solid waste districts in Indiana have a solid waste plan; however, many plans are out of date with most being over twenty years old. Effectively, there is no guiding document that provides the state or solid waste districts the detail or a roadmap towards achieving objectives with respect to solid waste and recycling. The recycling goal of 50% diversion will be very difficult to achieve without the state, solid waste districts, and local communities participating in the planning process. Surrounding Midwest states such as Ohio, Michigan, and Illinois have a comprehensive planning process for solid waste districts. The State of Michigan is currently in the legislative process to significantly update the solid waste or materials management planning structure.

### **State Solid Waste Plan**

The development of a statewide material management plan is a critical component to establishing programs, necessary infrastructure, and objectives for increasing landfill diversion and moving to a long-term sustainable model. Planning at the state level is necessary to provide structure, goals, and objectives. In addition, adequate staffing at the state level is necessary to implement solid waste planning locally at the solid waste districts. State-level staff would assist solid waste districts in the development of their solid waste plans, annual reporting of recycling, and the implementation of the solid waste district plan. State solid waste planning resources could provide the guidance and leadership needed to coordinate and facilitate the vision of a circular economy and 50% recycling.

*Recommendation B.1 Create State Solid Waste Plan and Format/Template for Solid Waste Districts*

*A statewide materials management plan will provide a strategic plan and roadmap for the long-term goals of a circular economy and 50% diversion. The planning process requires stakeholder input and the development of programs and a financial plan to complete the objectives.*

*Recommendation B.2 Update Statewide Materials Management Plan Every 5 Years*

*A statewide materials management plan must be updated every so often to continue improvements and stay up to date on current technologies, economics, and demographics throughout the state. The plan's data, goals, benchmarks, and timelines should be updated to stay current.*

**Local Planning & Solid Waste Districts**

Material management plans should replace the requirement for solid waste plans. The focus should be on creating value from waste and using waste as a resource. The plans should be developed at the local level with the solid waste districts as the lead agency working with local communities and businesses to create a plan that is uniquely designed around the economic and business community needs, strategies, and objectives of the state and districts.

The state should take the lead with the planning requirements. This would include:

- Updating the Indiana legislation for solid waste planning at the local level (solid waste districts).
- Creating a specific format and guide for all solid waste districts and the State of Indiana to follow. The overarching goal of the plans will be to manage waste materials by rethinking their use to eliminate waste in the first place and then reduce, reuse, and recycle.
- An analysis of the current solid waste system including diversion percentages, goals established by the solid waste district, programs designed to meet the goals, and an education and outreach plan.
- An update every five years.
- Creation and approval by local stakeholders and communities.
- Education by solid waste districts should continue, but the state must lead the solid waste districts and reignite the passion to rethink the mission and goals and reignite the passion for managing waste as a resource in the new circular economy.

Included in each materials management district plan should be an analysis of collaborations and partnerships with bordering solid waste districts. These collaborations could be used for programming, collection services, and ancillary services. Especially in the rural counties, collaboration can help keep costs down while

offering services such as household hazardous waste collection, electronics recycling, and other ancillary services in both single county districts and multi-county districts. Multi-county districts should be encouraged to join with other districts when it is mutually beneficial. Multi-county districts do have advantages including shared funding, volume pricing for services, and sharing of resources.

### *Recommendation B.3 Update Solid Waste District Materials Management Plan Every 5 Years*

*A district materials management plan will provide a locally developed and implemented strategic plan and roadmap for a circular economy and 50% diversion. The district planning process will obtain local stakeholder input and will develop programs for the local community with a financial plan to complete the objectives. Using a consistent format provided by the state will enhance the statewide planning process from all solid waste districts.*

## Zero Waste, Sustainability, and the Circular Economy

Many communities across the country are developing zero waste plans, sustainability plans, and circular economy plans. Several larger cities have had these plans in place for many years. Many suburban communities are also developing similar types of plans. Each of these plans have a long-term sustainability focus, and, while the scope of the plans may vary, one consistent element is a solid waste and recycling element for residential, commercial, institutional, and industrial sectors. Many of the communities obtain funding to pay for the plans through various local, state, and national grant programs.

When developing these plans, the solid waste system is a key element that ultimately drives success for the plan. When a community undertakes developing a sustainability plan, an updated state or local solid waste plan can provide the foundation of the plan.

### *Recommendation B.4 Provide Funding for Zero Waste, Circular Economy, and Sustainability Plans for Communities.*

*Funding for zero waste and sustainability plans for communities through grant programs provided locally, at the state level, or through environmental associations will encourage communities to create plans incorporating recycling diversion goals.*

## C. INDIANAPOLIS AND MARION COUNTY

---

Indianapolis, the largest city in Marion County, is the nation's 14<sup>th</sup> largest city, and it is a significant contributor to Indiana's economy. However, Indianapolis has one of the lowest recycling rates in the country at 7% and is the biggest municipality without a curbside recycling program serving every customer.

Indianapolis and Marion County have disposal facilities that include a waste to energy facility, two transfer facilities, and one landfill. Indianapolis recycling diversion was 7% in

2019. The tonnage processed by the waste-to-energy (WTE) facility are listed below in **Table 3C-1**. It is important to note that 38% of tons processed were from non-MSW sources and 22% of the tons processed are generated from out-of-state sources. Increased recycling in Marion County would divert 52% of the tons processed through recycling.

**Table 3C-1 2019 WTE Indianapolis Inc. Tons**

Generator	2019 Tons	Percent
Marion County	366,310	52%
Indiana (not Marion County)	68,464	10%
In-State (non-MSW)	119,540	16%
Out-of-State (non-MSW)	148,106	22%
Total	702,420	100%

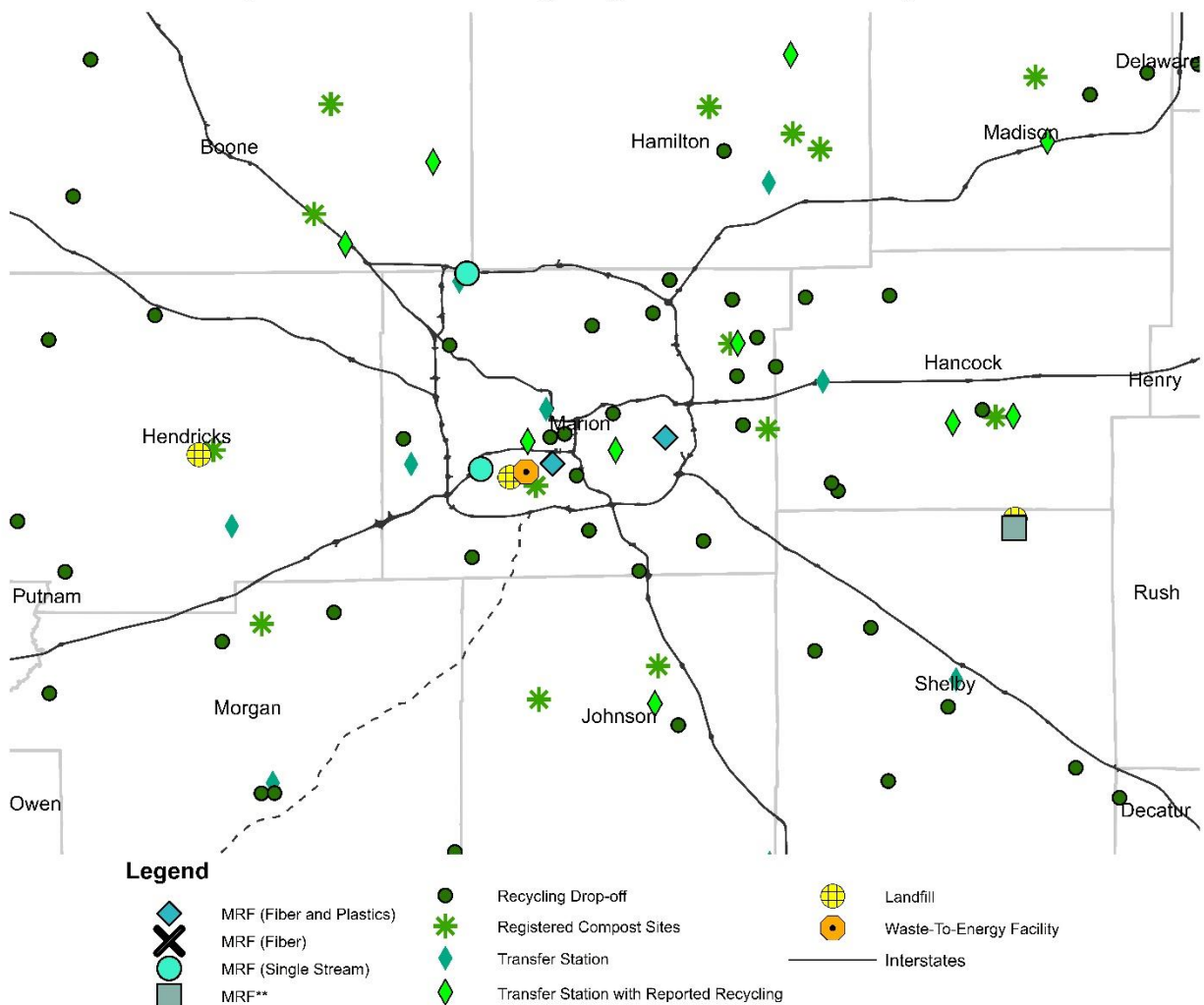
There are two single stream MRFs located in Marion County that support single stream curbside collection programs in Marion County and the surrounding region. Total tons processed by the MRFs in 2019 amounted to 84,098 tons. If Indianapolis provided non-subscription curbside service to residents where recycling was a free bundled service with trash collection, the recycling rate could increase to over 20% depending on the type of service implemented. This could amount to over 125,000 additional recycling tons per year. While the surveys of the processors did not provide capacity information, a significant increase in recycling would require increases in processing capacity needed for a non-subscription bundled curbside program.

In addition, there are 2 MRFs located in Marion County that collect only fiber and plastic materials. These MRFs processed approximately 92,292 tons.

The map below provides a visual location of the facilities in Indianapolis and Marion County as well as regional surrounding counties.

### Map 3C-1 Central Indiana Material Management Facilities

2019 Indianapolis and Surrounding Region Materials Management Facilities



\*\*Non-specified MRF type but reported more than one type of material.

Marion County is one of the few counties in the State of Indiana that does not have a solid waste district. In 1990, the Indiana General Assembly passed Public Law 10-1990 which created solid waste districts for all counties except Marion County.

Marion County has significant solid waste infrastructure including landfills, transfer stations, a waste-to-energy facility, compost facilities, and MRFs. Collection and processing of recyclables is managed by private companies and public systems. The Marion County solid waste system has many assets; however, it does not have a solid waste plan nor a solid waste district to provide unified leadership, guidance, education and outreach, and other resources. The county should develop a materials management plan similar to other solid waste districts that requires public and stakeholder participation and includes recycling goals and objectives. Also included in the plan would be a roadmap or tactical plan to achieve the goals and objectives.



As part of the materials management plan development, Marion County should do a regional analysis of the surrounding counties in central Indiana. This regional or waste shed analysis would review infrastructure in the region including processors and end users. Areas of opportunity include collaboration with the region and creation of a central region solid waste system and circular economy. An example would be a regional sustainable business park with central Indiana providing recyclables to the businesses and processors.

For the State of Indiana to successfully achieve its 50% recycling goal and develop the circular economy, Indianapolis and Marion County need leadership and a shared vision from all stakeholders culminating in a solid waste plan to achieve recycling goals.

It is critical that Marion County be a leader in the next steps for materials management in Indiana. How Marion County is required to participate in the next phase of management of resources regarding the generation and recycling of materials is a question that must be considered by stakeholders and the state legislature.

The leadership in materials management for Marion County and Indianapolis has begun and is in the early implementation and planning phase. In 2019, the City of Indianapolis and Marion County adopted a sustainability plan titled *Thrive Indianapolis*. *Thrive Indianapolis* is a comprehensive sustainability plan that includes goals and key metrics for recycling.

<https://static1.squarespace.com/static/5b4ead40c3c16a711ae78401/t/5c704aa4fa0d6033019e373a/1550863041205/2019cpsr001-thriveindianapolis-web.pdf>

The 2020 Annual Report of *Thrive Indianapolis* indicated that 16,345 tons of recyclables were collected from curbside recycling collection and 16 drop-offs located throughout Marion County.

[https://static1.squarespace.com/static/5b4ead40c3c16a711ae78401/t/60871a976cb1991ddb1cd\\_c26/1619466907102/finalthriveannualupdated2020+%281%29.pdf](https://static1.squarespace.com/static/5b4ead40c3c16a711ae78401/t/60871a976cb1991ddb1cd_c26/1619466907102/finalthriveannualupdated2020+%281%29.pdf)

### *Recommendation C.1 Create a Solid Waste District and Plan for Marion County*

*A solid waste district for Marion County would create an independent organization that could create a materials management plan integrating the public and private infrastructure and all stakeholders into a comprehensive unified solid waste system with overall goals and objectives. The materials management plan would provide for a specific recycling and diversion plan that would support the overall sustainability plan. The materials management plan would create a detailed implementation plan that could include programs, such as, a non-subscription curbside recycling program.*

### *Recommendation C.2 Non-subscription Curbside Recycling Program*

*A curbside program that is a bundled service with the trash collection could have an immediate impact on the Indianapolis recycling rate. With education and outreach supporting the program the recycling rate could achieve 20% or higher.*

### Recommendation C.3 Regional Collaboration

As **Map 3C-1** shows, there is significant solid waste infrastructure in Marion County and surrounding counties. The materials management plan in recommendation C.1 should include a detailed analysis and review of full utilization of disposal and recycling infrastructure and planning for new investments in infrastructure in the region.

## D. STATE AND LOCAL FUNDING

### State Funding

A solid waste management system is a basic public service similar to water infrastructure and power infrastructure. The basic underlying need is a system that manages waste for the benefit of the public health of a community and its citizens. The solid waste system is as fundamental to society as water supply/treatment systems and power systems for residents and businesses. On the consumption side, reducing, reusing, and recycling are needed to move toward a sustainable society. Regarding raw material and economic inputs, recycling and composting are the next step to a circular economy.

The key processes for the consumption element of waste management are collection, transportation, landfills, composting, and recycling. All elements of the waste management system should be evaluated as an entire system or holistic approach. The Midwest has an abundance of inexpensive landfill capacity. This cheap disposal can significantly impact recycling as the total cost of recycling is more expensive than landfill disposal. Included in the cost of disposal is landfill fees.

States and local communities utilize different mechanisms to support their solid waste disposal and recycling programs. A common practice is a fee at the landfill typically charged per ton of material disposed. State disposal fees for Indiana and surrounding states are listed in the table below. The State of Indiana disposal fee charged at the landfill is one of the lowest and is substantially lower than many of the surrounding states.

**Table 3D-1. State Solid Waste Disposal Landfill Fees as of April 1, 2021**

State	Disposal Fee \$/Ton
Ohio	\$4.75
Illinois	\$2.22
Kentucky	\$1.75
<b>Indiana</b>	<b>\$0.60</b>
Michigan	\$0.36

A low landfill fee can have multiple impacts on a solid waste system.

- Reduced fees provide less funding for solid waste and recycling programs.

- Significantly lower fees can also make it more economically advantageous for trash to be imported from surrounding states to Indiana landfills.
- Lower fees also result in a lower landfill gate rate. This low landfill rate becomes the economic benchmark to evaluate recycling programs. Recycling processing costs are a function of commodity market values that fluctuate daily whereas, landfill rates are more stable or predictable. A low landfill disposal rate when compared to variable recycling processing affects the economic potential of recycling programs.

A comprehensive holistic approach to managing solid waste from an economic perspective can include the total cost to provide solid waste and recycling services. In addition, increasing the Indiana landfill fee to provide funding for a more comprehensive and robust solid waste system could include funding for solid waste planning, infrastructure compliance, and funding for recycling programs.

Indiana should consider increasing the disposal surcharge as an option for funding planning, recycling programs, data collection systems, grants, and other enhancements for the solid waste system and circular economy.

### *Recommendation D.1 Increase State Disposal Fees to Provide Funding for Materials Management Enhancements*

*Increases in the state fee could provide funding for the materials management planning process for the state, upgrades to the data collection system, provide for additional solid waste district support, and incentivize the improvements to recycling infrastructure.*

### Local Funding

Stakeholders and the Indiana legislature should also review the funding source mechanisms available to solid waste districts. Currently, property taxes are used by many districts to support solid waste district programs. Other mechanisms such as a landfill surcharge is used by some solid waste districts for funding. User fees from other programs such as composting, and household hazardous waste can also raise revenues for districts. Fees are essential to ensure the districts have ample funding for waste professionals, programs, and infrastructure.

There are many fee options such as flow control that are in effect across the country and in neighboring states that help the solid waste districts fund priorities for programming and infrastructure. IDEM should evaluate whether a revision to the local fee system would enable districts to better serve their residents and reach new goals for a circular economy.

### Flow Control

Flow control is a legal mechanism authorized in state law that can be used to support public infrastructure. Flow control is a legal mandate to direct waste streams to specific facilities. The legalities of flow control can be very complex and can use different legal

mechanisms. Some include designation of facilities by solid waste districts to ensure that fees are remitted back to the solid waste district. Contractual flow control can be an effective way to direct waste streams to facilities. With contractual flow control, communities contractually agree to direct their waste and recycling streams to a facility for an extended period of time. Ensuring the flow of waste is important to financing entities to make sure that infrastructure that is financed through public debt stay solvent while payments are made on the facility to repay the debt. Examples include infrastructure including transfer stations, landfills, and recycling facilities.

Flow control can be controversial and hauling companies have challenged these laws all the way to the U.S. Supreme Court. The court rulings are complicated, and applicability depends on how the ordinances and regulations are written. Flow control is a tool to be used by local solid waste districts when appropriate and when it is in the public's interest.

*Recommendation D.2 Local Funding for Solid Waste Districts.*

*Review current funding mechanisms for solid waste districts to ensure there are adequate opportunities for districts to implement a materials management plan and implement the district plan.*

## E. RECYCLING COLLECTION PROGRAMS

---

The material management plans recommended earlier will provide the platform to review existing collection programs and develop new programs and services to increase recycling. Materials management plans can also be used to implement best practices statewide and at the local district level. Some general best practices are discussed below.

### Residential Recycling Collection

Recycling drop-offs are an important infrastructure especially for rural areas with limited access and low-density populations. Some of the improvements for drop-offs include:

- Standardized containers
- Standardized materials collected
- Standardized signage
- Cameras to discourage dumping
- Drop-off locations that can be observed by district staff
- Advertised locations of drop-offs

Rural areas could also implement recycling transfer compactors that haulers could use to unload recyclables picked up from rural curbside collection routes. These transfer compactors can eliminate the need for rural curbside route trucks from driving long distances to recycling facilities or transfer stations.

Regarding curbside collection, carts are generally considered the best container. The carts should:

- Be purchased with RFID tags to assist with collecting participation data
- Include the basic guidelines of recycling on the lid to communicate program basics to residents
- Minimum of 65-gallon in size

Efficiencies in collection include automation in trucks for the collection of materials from carts. Many communities also utilize every other week collection to keep collection costs down. For every-other-week collection, 95-gallon carts may be necessary to provide adequate capacity.

The infrastructure analysis and maps earlier in this report showed that there are significant areas that are underserved with respect to recycling access. Drop-offs near multi-family housing and curbside recycling programs can significantly increase recycling participation. It should be noted that non-subscription curbside, which is a bundled service with trash, is recommended because it has a higher participation rate. Residents view non-subscription recycling service as a free service because they do not have to pay for it as it is included in their trash service. Whereas, subscription service, which is offered in Marion County, requires the residents to pay an additional fee and historically has a much lower participation rate.

### Pay as You Throw (PAYT) Programs

Similar to cable, phone, and electric, pay-as-you-throw (PAYT) programs are a trash and recycling collection methodology that charge residents based on the amount of trash set out. Typically, recycling is not charged in a PAYT program. PAYT programs can be set up in many different formats including carts, bags, or stickers. The goal of any PAYT program is to incentivize and create an economic decision for the resident to manage their waste stream and recycle as much as possible to reduce their trash costs. A sustainable recycling system begins and ends with the resident. A 50% recycling diversion rate is achievable if curbside programs are designed to create active decision making and participation of residents in solid waste management.

### *Recommendation E.1 Materials Management Plans and Recycling Best Practices*

*Materials management plans and improved data collection will provide a statewide system where recycling collection programs can be benchmarked, and best practices developed and shared across the state.*

### *Recommendation E.2 Require or Recommend Minimum Access*

*When developing materials management plan formats, the state may require or recommend that local solid waste districts must provide recycling access to a certain*

*percentage of residents in the district. This will educate and incentivize solid waste districts to provide adequate infrastructure for their region.*

## F. RECYCLING PROCESSING

Material recovery facilities (MRF) support regional recycling programs throughout Indiana. Recycling and specifically sorting technology continues to improve. MRFs continue to add technology such as sensors and robots to automate the sorting of recyclables. Automation increases the processing capacity of the MRF and improves the quality.

One material where the circular economy and recycling processing could be enhanced is glass. Glass material is shipped outside Indiana for processing and is then shipped back into the state as feedstock for end users in Indiana. A central Indiana glass processing facility should be evaluated and determined to provide much needed processing capacity. IDEM should work with appropriate solid waste districts and economic development agencies to analyze this possibility and develop a plan to attract a processing facility if warranted.

The recycling processing capacity and associated economic investment capital for the recycling industry could not be effectively estimated based on the limited surveys returned. However, the IMPLAN model quantifies economic output which utilizes capital to create output. As recycling collection and processing output increases, the capital needed increases. The increase in capital is proportional in the model but it assumes that the capital investments are made as needed to process the increases in recycling. As shown in **Table 2D-1**, the increase in supply of recyclables of 22% would result in an increase in total direct output of \$224 million. Increases in economic investment (capital) would be required to achieve this output. This investment capital could be funded by public or private investment sources but would need to be market driven with an acceptable return on investment.

The success of recycling processing facilities is tied closely to regional education and outreach. Messaging should be consistent throughout the region with respect to what is acceptable for curbside and drop-off programs. A regional education and outreach approach should be used to communicate a consistent and easy-to-understand list of acceptable materials. The education and outreach message should also include common contamination issues in the region. The education and outreach messaging can be coordinated at both the levels of the state and solid waste districts. The state, districts, and other entities such as the Recycling Partnership should work together on recycling messaging and projects to ensure residents are assisting with recycling processing by “recycling right.”

### *Recommendation F.1 Regional MRF-Shed Development and Support*

*As recycling continues to increase, additional infrastructure will be required. Currently, glass is being exported for processing in other states and returns as raw material to*



*Indiana end users. As technology and the demand for processing increases, additional investments in MRF processing will be necessary. The solid waste materials management plans should evaluate the MRF-sheds and identify opportunities for recycling processing.*

#### *Recommendation F.2 MRF Education and Outreach*

*MRF processing requires education and outreach with a consistent and effective messaging to minimize contamination. A unified education tool kit created at the state level that supports the MRFs should be developed and implemented at the local district level.*

## **G. ORGANICS & FOOD WASTE**

---

Food waste is a significant waste stream that can be managed in the residential and commercial sectors to improve and achieve high rates of diversion in the circular economy. Food waste programs for residents can be effectively implemented at the curb with the following considerations:

- Significant and effective outreach to mitigate contamination
- Multiple food waste processors
- Efficient collection systems can be evaluated to combine with yard waste collection
- Markets for compost
- Back yard composting education

Many communities, including rural areas, have created consortiums where services are aggregated for all participating communities providing opportunities for increased services at aggregated competitive rates. The consortiums can be created and facilitated by solid waste districts who assist with the bid documents, evaluation of the bids, and contract finalization.

#### *Recommendation G.1 Organics Recycling Including Food Waste*

*To achieve a 50% recycling rate, a robust organics program including food waste collection will be necessary. To develop a comprehensive organic program, IDEM should identify high performing recycling communities across the state, region, and nation and develop pilot programs that can be models for other communities in the state. Implementing a successful food waste organics program will require one or more food waste composting processing facilities close to the pilot community, investments in carts or containers, and an education outreach program.*

## **H. GRANT PROGRAMS**

---

Grant programs can provide significant funding for collection, processing, and end user infrastructure. Grant funding is currently available from IDEM through the Recycling Market Development Board (RMDB) and the Indiana Community Recycling Grant

Program. Grant funding is also available from national organizations such as Keep America Beautiful, USEPA, and the Recycling Partnership. These organizations provide valuable funding for a variety of recycling programs.

Local grant programs are an important source of funding and can be incorporated in materials management district plans to support specific initiatives as outlined in the plan. The materials management planning process can be used to authorize the grants with local committees evaluating the grant applications. These grants can be used for communities and businesses providing funding to collection, processing, and end users of recycling. Solid waste districts can provide valuable outreach and support for their local communities and businesses.

### *Recommendation H.1 Grant Funding*

*IDEM currently offers grant programs which provide funding for programs in the state; however, local grant programs can provide additional funding to local communities. The district materials management plans can establish local grant programs that are funded and managed locally. The state may require acknowledgement or implementation of grant programs in local solid waste district plans.*

## **I. ECONOMIC DEVELOPMENT**

---

The economic evaluation of recycling estimated that the direct employee compensation for the recycling industry amounted to \$513 million with overall output contribution to the economy exceeding \$1.7 billion (**Table 2B-2**). A 10% increase of recyclable tonnage collected (**Table 2D-3**) will provide an additional 426 direct employment positions and 103 million in total output for the economy.

Moreover, the economic evaluation estimated that a 10% increase in recycled material used by end users could add over \$4.2 million from commodities' contribution in total output for the economy (**Table 2D-4**). Thus, increases in Indiana recycling can have a significant economic impact in the recycling industry and end user output.

An integrated approach to economic development supporting recycling collection, processing, and end user consumption of recyclables will create great economic value and further develop the circular economy in Indiana. Economic development agencies at the local, regional, and state level should work closely with solid waste districts and state environmental agencies.

In addition, increases in the recycling industry will generate increases in taxes to local communities and the state. See **Tables 2E-1, 2E-2, and 2E-3** that demonstrate the amount of taxes currently attributable to the recycling industry.

An example of a significant investment in a circular economy solid waste infrastructure is Kent County, Michigan's Sustainable Business Park. The Kent County Michigan Public Works Department has a bold goal to divert 90% of solid waste generated in the

county from its landfill by 2030. The Sustainable Business Park is critical infrastructure to achieve that goal by

- Leveraging private sector development
- Localize recycling or conversion process
- Generate and use renewable energy
- Expand research

For more information see the link below.

<http://www.reimagetrash.org/sbp/>

An example of economic development integrated with solid waste recycling is the EcoPark located in Martinsville, Indiana, located in the Morgan County Solid Waste Management District. When the second phase is complete, a recycling facility or MRF will be within the EcoPark supplying feedstock to the industries located in the park. The MRF is expected to collect 15,000 to 30,000 pounds of recycled material for the businesses in the park.

<https://www.ggtogether.org/ecopark>

### *Recommendation I.1 Integrated Materials Management and Economic Development*

*Collaboration and support between economic development programs and materials management programs will promote economic growth for end users that utilize recyclable materials. Leveraging economic development programs to support business expansion for the circular economy will support the collection programs and infrastructure. Economic development agencies at the local, regional, and state level should work closely with solid waste districts and state environmental agencies. The economic development agencies and the solid waste districts should have a reciprocating understanding of the programs and services that they both offer. To effectively create a circular economy, end users of recycling feedstock must be established in the State of Indiana.*

## **J. END USER RECYCLING MARKETS**

---

End users need recycled materials collected from residents and businesses in the State of Indiana. The end users use the recyclables as raw materials or feedstock to manufacture products that are marketed to residents and business; thus, they close the loop for the circular economy. As the infrastructure analysis shows, the demand for Indiana recyclables exceeds the supply. Moreover, a significant number of recyclables collected in Indiana are shipped out of the state. **Table 4J-1** provides aggregate recycling feedstock capacity for end users and processors who responded to the surveys. Based on the limited surveys all commodities have excess capacity except for fiber end users.

**Table 4J-1 End User & Processor Recycling Capacity**

End User	Current Capacity %	Excess Capacity %
Glass	86%	14%
Metals	71%	29%
Fiber	100%	0%
Plastic	34%	66%
Processor	91%	9%

As the infrastructure analysis shows, it is difficult to obtain data with respect to the end user materials. The IDEM Solid Waste and Recycling Data Reporting Program maintains excellent data on collection and processing, but in order to effectively close the circular economy loop, data from the end users will be needed.

One concern many private companies have is the proprietary nature of the information. Many companies and end users do not provide data because of the concerns of their data being publicly available and available to competitors. An end user system may need to be legislatively mandated but also developed to protect company-specific data. The data may need to be aggregated by end user associations and then provided to IDEM thereby protecting the end user specific information.

There are new technologies that allow for the accumulation of data while maintaining anonymity of the end user. An example is Walmart who utilizes block chain to manage its supply chain for green produce. Walmart uses the block chain to track suppliers of all produce and which store the product was delivered to. The blockchain provides data on all suppliers which maintains a high-quality standard throughout the stores, and if an issue arises, they can quickly obtain all data on the shipments. The blockchain requires every supplier to report data on a blockchain. Using the blockchain protects the data, allows the appropriate persons easy access to data, and protects the identity of the supplier. Walmart can trace green produce that was delivered to a store to the original farm in 2.2 seconds.

Extended producer responsibility (EPR) is a practice and a policy approach in which producers (end users) take responsibility for the management of the disposal and/or recycling of the products they produce once those products are designated no longer useful by customers. Responsibility for disposal may be fiscal, physical, or a combination of the two. The intergovernmental Organization for Economic Co-operation and Development's (OECD) definition of EPR includes two specific features: the shifting of responsibility for disposal "upstream" from municipalities to producers and encouragement through incentives to make the design of products more environmentally friendly.

EPR encourages an environmentally friendly design that can be easily recycled, effectively closing the loop, and providing more recycling material as feedstock. Many states are moving forward on EPR legislation for certain items in the waste stream that are difficult to recycle or dispose. EPR for Indiana businesses could significantly increase the materials that could be recycled and require data reporting.



### *Recommendation J.1 End User Reporting*

*An end user system will need to be legislatively mandated but also developed to protect company-specific data. The data may need to be aggregated by end user associations and then provided to IDEM thereby protecting the end user specific information.*

### *Recommendation J.2 EPR Legislation*

*Create legislation supporting, incentivizing, and requiring a minimum EPR level of large manufacturers who manufacture and/or use materials that are difficult to recycle and/or dispose.*

## **K. PUBLIC-PRIVATE PARTNERSHIPS**

---

Solid waste infrastructure and programs can be excellent opportunities for public-private partnerships. Creating win-win relationships allows both groups to leverage their areas of expertise to deliver high quality services at affordable prices. Public-private partnerships can be designed in many different situations and circumstances. These partnerships can be local, regional, or statewide.

Excellent examples include public ownership of facilities operated by private companies. Many facilities are built on public land utilizing design-build-operate projects where the private company has a long-term contract and the return on investment will be realized over the length of the contract. Public-private partnerships can also leverage aggregated tonnages from both parties creating efficiencies in the system and lower operating costs.

Examples of initiatives for public-private partnerships include Next Cycle Michigan and a similar program Colorado Next Cycle. Both initiatives provide programmatic support and funding opportunities for regional infrastructure and end markets to provide for a more sustainable recycling economy. The active partners for these organizations include public entities and private companies.

<https://www.nextcyclemichigan.com/>

<https://cdphe.colorado.gov/sustainability-programs/recycling-grants-support/recycling-resources-economic-opportunity-program>

Another public private initiative supporting the circular economy is the Circular Economy Accelerator created by the Recycling Partnership. Key elements of the initiative include,



- Advocating for sustainable funding
- Inspiring policy to incentivize recycling over disposal
- Developing new models to expedite public private partnership solutions

<https://recyclingpartnership.org/accelerator/>

*Recommendation K.1 Utilize and Promote Public Private Partnerships*

*Public-private partnerships and associations can provide significant leadership and support for circular economy initiatives. There are examples of other statewide programs that Indiana could use as a model for an Indiana initiative. Indiana public-private initiatives could provide significant programmatic and assistance with obtaining funding for collection, processing, and end user infrastructure. The state should require acknowledgement and planning for public-private partnerships in local solid waste management plans. Additionally, the State should analyze opportunities to formally connect with private entities on improving solid waste systems in the state.*

**L. RECOMMENDATIONS SUMMARY**

Approximately 8.8 million tons of solid waste was generated in Indiana in 2019, and 76% was disposed of in landfills, 5% to waste-to-energy, and 19% diverted through recycling.

The recycling collection and processing infrastructure has the capacity to grow another 10% without significant investment; however, to increase recycling beyond 10%, increases in capacity will be necessary. Also, increases exceeding 10% will require significant commitments in programs and services to increase participation. A consistent and standardized education and outreach message will be needed to support recycling and the circular economy. These changes will require a long-term holistic economic approach to fund a comprehensive materials management system supported by public and private assets.

Recycling is a significant contributor to Indiana's economy. In 2019, Indiana's recycling rate was about 19% which is substantially below the goal of 50%. There is significant positive potential for the economy as the recycling rate increases. Economic investment in collection, processing, and end user markets in Indiana creates a circular economy where the full benefit of recycling is realized.

These twenty-four recommendations are meant to stimulate discussions with stakeholders to develop solid waste data systems, changes in policy, materials management planning, funding, and structural updates that will provide the foundation for the circular economy. A long-term roadmap and commitment are required to increase landfill diversion, maximize recycling, and build a sustainable circular economy. This roadmap may include all or some of the recommendations as presented but will require many more initiatives and residential, commercial, industrial, and institutional support. It is difficult to calculate the impact or prioritize the recommendations; however, implementation of any or many of recommendations will move the State of Indiana towards the 50% recycling rate and provide the foundation for the circular economy.