



# Economic Study of Recycling in Colorado Final Report

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# Contents

	<b>Page</b>
<b>Executive Summary</b>	<b>iv</b>
<b>1 Introduction</b>	<b>1</b>
1.1 Objectives	1
1.2 Process	2
1.3 Structure of the Report	2
<b>2 Data Gap Analysis</b>	<b>3</b>
2.1 Purpose and Need	3
2.2 The Recycling Industry	4
2.3 Information Required to Conduct the Analysis	4
2.4 Data and Information Available through Secondary Sources	6
2.5 Data Gaps	10
2.6 Summary and Conclusion	13
<b>3 Survey Plan</b>	<b>15</b>
3.1 Purpose and Need	15
3.2 Approach and Methodology	16
3.3 Sampling Plan	18
3.4 Survey Instrument	18
3.5 Summary	18
<b>4 Data Collection</b>	<b>20</b>
4.1 Purpose and Need	20
4.2 Approach and Methodology	20
4.2.1 Sampling	21
4.2.2 Survey Instrument	21
4.3 Survey Results	22
4.3.1 Survey Results Summary by Sector and NAICS Code	22
4.3.2 Complete Survey Results	32
4.4 Summary	52
4.5 Lessons Learned	52
<b>5 Regional Impact Analysis</b>	<b>54</b>
5.1 Data Development and Sources	54
5.2 Analytical Approach and Impact Methodology	56
5.3 Results	61
5.3.1 Employment Impacts	61
5.3.2 Labor Income Impacts	62
5.3.3 Total Output / Demand Impact	62
5.3.4 Tax Revenue Impact	65
5.3.5 Accuracy of Results	67
5.4 Conclusion	67

<b>6</b>	<b>Policy Recommendations</b>	<b>68</b>
<b>7</b>	<b>References</b>	<b>69</b>

List of Appendices

- Appendix A: Survey Questions
- Appendix B: Email Sent to RRR Industry Representatives and Survey Recipients
- Appendix C: Letter from Colorado Department of Public Health and Environment to RRR Industry Representatives and Survey Recipients sent as an Attachment with the Survey Request Email
- Appendix D: Select Survey Responses by Business Category

## Acronyms and Abbreviations

Department:	State of Colorado Department of Public Health and Environment
ENVIRON:	ENVIRON International Corporation
IMPLAN®:	IMpact analysis for PLANning
NAICS:	North American Industry Classification System
RRR:	Recycling, remanufacturing, and reuse

## Executive Summary

ENVIRON was retained by the State of Colorado Department of Public Health and Environment (Department) to conduct an economic impact study of waste diversion in Colorado. The overall purpose of the study was to identify the economic impacts the recycling, remanufacturing, and reuse (RRR) industry on the State economy, with particular focus on how RRR affects both urban and rural areas of the state. The study had several components, each of which built on the previous component, with final results presented in this composite report. The separate study components are:

- Data Gap Analysis
- Survey Plan
- Data Collection Report, and finally,
- Regional Impact Analysis

The RRR industry comprises all government and private entities involved in collecting recyclable materials, processing of such materials, manufacturing products from recycled materials, and using and remanufacturing products from recycled materials. The economic impact analysis uses existing data combined with new data collected through a survey process. The survey was used primarily to develop supporting information for the economic study. Specifically the survey results provided the percentage of a respondent's business activity that included RRR sector activities. For the sectors where survey responses were not robust, outside sources were used for this percentage. Two regional models were developed for the analysis: one for the urban region (defined as all urban counties combined) and one for the rural region (defined as all rural counties combined). This allowed the Department to identify specific attributes and/or needs of each of the regions, which have different economic structures.

Significant results of the analysis include the following conclusions:

- The direct impact of the RRR industries totals \$8.7 billion, with most of that (\$8.1 billion) occurring in the urban areas.
- The total impact of the RRR industries, including the direct, indirect, and induced impacts totals \$14.7 billion, with \$13.9 billion occurring in the urban areas.
- Given a total Gross State Product (GSP, or the state counterpart of GDP) of \$279.6 billion in 2012, RRR activities account for 3.1 percent of GSP in direct impacts, and 5.3 percent of GSP when considering the total impact from these sectors.
- The RRR industry impacts total nearly 86,000 jobs in the state representing 2.7 percent of overall employment in Colorado.
- Urban jobs in the RRR industry account for 80,394, or 2.9 percent of all urban employment, and rural jobs in the industry are estimated to total 5,433, or 1.2 percent of all rural employment.
- This employment translates to over \$200 million in labor wages in the rural region, and greater than \$5 billion in the urban region.

- Annual state and local tax revenue generated through the RRR industry is estimated at over \$80 million for the rural region and approximately \$1.2 billion for the urban region.

The results of the survey and the impact analysis are also interesting. The survey produced results from entities operating in nearly all Colorado counties indicating:

- Nearly 80 percent of entities do business within the State of Colorado, and nearly 69 percent do business outside the State;
- More than 70 percent of respondents believe that there is a demand for recycled materials in Colorado;
- The RRR industry travels a large number of miles both to collect recycled materials and to move materials for processing, with nearly 60 percent traveling over 50 miles and nearly 30 percent traveling more than 100 miles to collect recycled materials;
- On average, material movement for processing is more than 100 miles to 16 facilities and to 8 facilities less than 50 miles; and
- Only 31 percent of respondents partner with local Colorado manufacturers to use recycled materials for their manufacturing needs.

The survey results and the impact analysis results lead to the development of several policy recommendations for the State of Colorado. These recommendations include:

1. There is an opportunity to improve the multiplier effect (the additional indirect and induced effects) for RRR sectors in the rural areas if government policies can target sectors favorably linked with RRR sectors.
2. If there is high unemployment in any county, public recycling facilities can be located in these areas and result in an economic stimulus.
3. To strengthen rural county RRR multipliers, the spatial location of strong RRR sector establishments should be analyzed to see if there are 'leakages' of indirect and induced impacts across state borders.
4. Existing government programs that support industries like manufacturing, can consider supporting and strengthening the economic activity that is linked to manufacturing through the RRR sector, thereby maximizing the benefit of government investments in jobs and economic development.

# 1 Introduction

Recycling, remanufacturing, and reuse (RRR) industries can have a major positive impact on the overall economy of a state. Studies conducted for many states, as well as overall for the United States (US), have assessed and documented these positive economic impacts.<sup>1</sup> ENVIRON International Corporation (ENVIRON) has conducted this economic impact study of waste diversion in the State of Colorado for the State of Colorado Department of Public Health and Environment (Department). The overall purpose of this study is to identify the economic impacts the RRR industries have on the State. The Department's objectives with the results of this study include enhanced ability to set strategic goals for the Department, implement feasible and effective programs and policies for waste diversion, attract new businesses, markets, and end-users to Colorado, and to realistically track economic progress throughout the state.

## 1.1 Objectives

The overall objective of this study is to identify the economic impacts that waste diversion has on the State of Colorado. In order to assess these impacts, this study identifies the following:

1. Quantity and variety of recyclables available for local remanufacturing, and to which industries these materials would be applicable (agriculture, aerospace, consumer goods, bioscience, energy, etc.).
2. Number of jobs created by geographic area; including a consideration of the economic impact of waste diversion in rural and urban areas and identification of whether rural areas see a lesser or greater per capita benefit in their local economies from that investment when compared to urban areas.
3. Potential for job creation based on increased diversion.
4. Local and state tax revenues, and potential for increased revenues based on increased diversion.
5. Trickle-down effect (i.e., employees within the industry spending money in the State, etc.).

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<sup>1</sup> R.W. Beck, Inc. 2001. U.S. Recycling Economic Information Study. Prepared for The National Recycling Coalition. Available online at: [http://www.epa.gov/osw/conserves/tools/rmd/rei-rw/pdf/n\\_report.pdf](http://www.epa.gov/osw/conserves/tools/rmd/rei-rw/pdf/n_report.pdf); SAIC Energy, Environment & Infrastructure, LLC (SAIC). 2013. The Economic Contribution of the Recycling Industry to the Houston-Galveston Region. Prepared for the Houston-Galveston Area Council. Available online at: [http://www.hgac.com/community/waste/management/recycling/workshops/recs\\_h-gac%20-economic-contribution-report.pdf](http://www.hgac.com/community/waste/management/recycling/workshops/recs_h-gac%20-economic-contribution-report.pdf); The National Recycling Coalition (TNRC). 2000. Florida Recycling Economic Information Study. Prepared for the Florida Department of Environmental Protection. Prepared in association with R.W. Beck, Inc. Available online at: [http://www.wastexchange.org/upload\\_publications/Florida-EconomicImpactofRecyclingStudy2000.pdf](http://www.wastexchange.org/upload_publications/Florida-EconomicImpactofRecyclingStudy2000.pdf); Valentine, David, Ann Ulmer. 2005. Missouri Recycling Economic Information Study MOREIS. Final Report. Prepared for Environmental Improvement and Energy Resources Authority (EIERA). Available online at: <http://eiera.mo.gov/eiera/files/2012/10/RecyclingFinalReport.pdf>

## **1.2 Process**

As a first step, ENVIRON developed a Data Gap Analysis, which was presented to, and reviewed by, the Department. Based on the gaps identified, the Department provided additional business categories and contact information for the RRR industries in the State. ENVIRON finalized the list of relevant entities and their contact information in order to initiate the survey process. A Survey Plan was then drafted, which outlined the plan to conduct the survey, and sought the Department's comments on the overall approach to be followed, the sampling plan, and the survey instrument. That document was revised based on the Department's comments. The online survey was conducted following that, and a third document, Data Collection Report, was then shared with the Department. That report presented the survey methodology that was applied, the response, and results of the survey. These three reports have been incorporated into this final report.

## **1.3 Structure of the Report**

The structure of this report follows the process of the larger study, as outlined above. This report has six chapters after this introduction. Chapter 2 presents the Data Gap Analysis that was carried out to assess the availability of existing data. Chapter 3 provides the Survey Plan that to conduct an online survey of RRR industries in the state. Chapter 4 documents the survey results, and other Data Collection efforts. Chapter 5 details the results of the regional economic impact analysis for recycling in the State of Colorado. Based on that, policy recommendations from ENVIRON are presented in Chapter 6. The results and conclusions of the study are summarized in Chapter 7. A list of all references completes the main report.

This report also has three appendices: Appendix A presents the complete survey instrument; Appendix B provides a draft email sent to the survey recipients; and Appendix C includes a letter sent to the survey recipients on behalf of the Department as an attachment to the email.



## 2 Data Gap Analysis

The first step in the study was to develop a data gap analysis, the subject of this chapter. This chapter was originally presented to the Department as a stand-alone report, and has been included in this report in a comparable manner. This chapter includes the following sections:

- Section 2.1 defines the purpose and need for the gap analysis.
- Section 2.2 provides an overview of the recycling industry (or industries).
- Section 2.3 describes the information required to conduct the economic impact analysis.
- Section 2.4 presents the data available from secondary sources.
- Section 2.5 illustrates and explains the gaps between the needed data and the available data.
- Section 2.6 summarizes the discussion presented in the chapter.

### 2.1 Purpose and Need

The methodology to be used in the study requires that significant and specific data be collected from available sources. ENVIRON used the economic input-output modeling system IMPLAN® (IMpact analysis for PLANning) as the basis of its analysis methodology. Direct economic effects are those attributable to the industries involved in RRR. Indirect and induced effects are the secondary economic impacts that occur in other sectors of a regional economy but as a result of the direct stimulus. The IMPLAN system is used primarily to quantify those secondary impacts. Results of both direct and secondary impacts will be presented in terms of jobs, income, gross domestic product (GDP), regional output, and taxes.

The analysis of direct economic effects will be based on the statewide data covering all facets of recycling, including feedstock collection, processing, and manufacturing. A review of literature on similar types of studies, as well as an understanding of the IMPLAN® software methodology, defines the types of data necessary to perform this study. This data gap analysis will determine what data and information is currently available from known sources, what data will be necessary to obtain through surveys, interviews, and other methods; and also what data is needed in order to conduct the surveys, interviews or other data collection efforts. This analysis includes an assessment of missing, incomplete, or non-verified data required to perform the study.

## 2.2 The Recycling Industry

The RRR industry comprises all government and private entities involved in collecting recyclable materials, processing of such materials, manufacturing products from recycled materials, and using and remanufacturing products from recycled materials. Thus, four broad business sectors make up the RRR industry:

1. Recycling collection
2. Recycling processing
3. Recycling manufacturing
4. Reuse and remanufacturing

The specific business categories within each of these four identified sectors fall into several subclasses each, and each subclass may be identified within the North American Industry Classification System (NAICS) code. These NAICS codes are the standard used by Federal statistical agencies in classifying economic activity. A total of 1,906 firms make up the 29 NAICS categories associated with RRR in Colorado.<sup>2</sup> However, some of those firms may not be involved in recycling activities and others may only have a portion of their business activities dedicated to recycling.

Analyzing the recycling industry can be a complicated task. The key issue is that of identifying which operations that have any recycling activities are solely devoted to recycling activities, and which ones have only a portion of the business associated with RRR. For example, one paper mill may only use recycled paper to make new paper, while another might use both recycled paper and virgin materials.

## 2.3 Information Required to Conduct the Analysis

The economic impact analysis to be conducted will follow a methodology similar to the one used by R.W. Beck, Inc. (2001) in a study of national economic impacts, and Valentine (2005), TNRC (2000), and SAIC (2013), which represent a sample of numerous similar studies that have analyzed the economic impacts for other regions. Specifically the above-cited studies were conducted for Missouri, Florida, and the Houston-Galveston region respectively.

In general, the information required falls into one of several categories. Within Colorado, the IMPLAN input-output model requires that economic activity to be analyzed be isolated within a NAICS sector. Hence at the outset, needed data include the number of facilities within Colorado that are involved in RRR activities, each identified by NAICS code. For the study, ENVIRON will further break down the analysis into county-level information, requiring the county of each RRR facility to be identified. For each county, the magnitude of the economic impact is measured by a) the total number of employees, b) the total revenue of all firms in each county, and c) the annual payroll, thus requiring the collection of these data.

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<sup>2</sup> U.S. Census Bureau. County Business Patterns. 2011. Available online at: <http://www.census.gov/econ/cbp/>.

Much of these data are available from the County Business Patterns data. County Business Patterns is published annually by the US Census Bureau and provides data on the total number of establishments, mid-March employment, first quarter and annual payroll, and number of establishments by nine employment-size classes by detailed industry for all counties in the United States. However, if there are too few firms in any sector at the county level, the data will not be disclosed due to proprietary concerns, and therefore ENVIRON must obtain that data elsewhere. ENVIRON is developing a survey of RRR firms to obtain the necessary economic data at the firm level, which can then be combined to provide the county-level data. Therefore, the final piece of information necessary for the completion of the study is contact information for all of the firms which comprise the RRR industry. This information includes the name of the firm, a contact person, the phone number of the contact person, and an email address for the contact person.

Another important data requirement is an estimate of the percent of the businesses activity that is associated with RRR only. For example, a glass manufacturer might produce glass from raw material, glass from recycled material, and might also collect glass bottles. Consequently, the entire revenue and jobs associated with the glass manufacturer cannot be allocated to RRR since only part of the business is associated with manufacturing glass from raw material. Only the share that is associated with glass collection and remanufacturing of glass material will be allocated to the RRR industry.

The specific data required and the data ENVIRON was able to acquire is compiled and presented in Table 2-1.

<b>Table 2-1: Data Required for Analysis</b>	
<b>Data</b>	<b>Description</b>
NAICS Code	The facilities North American Industry Classification System code which is a standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the business in the US
Number of Establishments	Total number of physical locations by NAICS Code
County	The location of each establishment that the firm operates
Number of Employees	Total full-time equivalents that the firm employs
Total Annual Payroll	Total compensation paid to employees including wages, benefits, bonuses, and other payments for each firm.
Total Annual Receipts	All revenue received, including receipts from sales and services for each firm
% RRR	Percentage of business activity that is associated with RRR for each firm
Contact Information	Firm names, contacts names, phone numbers, and email addresses for each firm in the industry

## 2.4 Data and Information Available through Secondary Sources

To determine which industries are associated with RRR by NAICS code, a careful collection of all the different economic activity levels by sector was compiled by NAICS code for Colorado and is included in Table 2-2. As previously stated, the RRR industry incorporates several different levels of activity, including collectors, transportation, recycling manufacturers, and reuse and remanufacturers. In addition, there are several economic sectors involved, including glass, rubber, electronics, vehicles, and other goods and materials.

As a first step towards identifying firms within the RRR industry, ENVIRON conducted research for available economic data based on 2012 NAICS.<sup>3</sup> The relevant business sectors and more specific business categories were determined through the research. The results of the research are presented in Table 2-2.

While some additional data will primarily be collected through a survey effort and interviews with industry representatives, some economic information for 2011 for some NAICS business categories is available through County Business Patterns data released by the U.S. Census Bureau.<sup>4</sup>

The key to the success of the data gathering process is the completeness and accuracy of names and contact information for the firms and industry representatives to be contacted within each of the RRR business sectors, including any coalitions or organizations representing specific business sectors, so that we may know all of the parties that should be requested to complete the survey and all of the parties that should be interviewed. ENVIRON has completed research to identify contacts for different business sectors including the key contacts' names, key contacts' roles/titles, key contacts' telephone numbers, and key contact's email addresses. The information collected from online sources is limited and inconsistent. Additionally, it is not clear whether these data include all operations under a specific business category, and also if the contact information is accurate and current.

In addition to online search, ENVIRON received the names and contact information for registered recycling facilities and landfills with household hazardous waste (HHW) recycling from the Department. The last four columns of Table 2-2 provide the status of the contact information found online for the various NAICS business categories. A half-filled-in moon means that we have identified a few or more specific firms with contact information for the ENVIRON team to contact for data collection. A completely empty moon means we were unable to locate any information for that specific contact element related to that specific business sector. It is evident that complete information is not available for any category through online sources. The key piece of information missing for most categories is email addresses of key contacts, given that the link to online survey would be sent via email in order to ensure that the process is conducted efficiently and in a timely manner.

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<sup>3</sup> U.S. Census Bureau. North American Industry Classification System. 2012. Available online at: <https://www.census.gov/eos/www/naics/>

<sup>4</sup> U.S. Census Bureau. County Business Patterns. 2011. Available online at: <http://www.census.gov/econ/cbp/>

Table 2- 2: NAICS Categories Associated with the RRR Industry and Status of Contact Information								
Recycling Category <sup>1</sup>		NAICS CODE <sup>2</sup>	NAICS Code Description <sup>2</sup>	Total Identified Facilities by NAICS Code <sup>3</sup>	Facility Contact Information Researched			
					Facility Name	Key Contact	Email	Phone
Recycling Collection	Government Staffed	562111	Solid Waste Collection	183	●	●	○	○
	Private Staffed	562112	Solid Waste Collection	8	●	●	●	●
Recycling Processing	Compost & Organic Producers	325314	Fertilizers	9	●	●	●	●
	Materials Recovery Facilities	562920	Materials Recovery Facilities	27	●	●	●	●
	Recyclable Material Wholesalers	423930	Recyclable Material Wholesalers	102	●	●	●	●
Recycling Manufacturing	Glass Container Manufacturing Plants	327213	Glass Containers	2	○	○	○	○
	Nonferrous Secondary Smelting & Refining	331423	Miscellaneous Secondary Nonferrous Smelting, Refining and Alloying.	1	●	○	○	●
		331492	Miscellaneous Secondary Nonferrous Smelting, Refining and Alloying. (except for copper and aluminum)	1	●	○	○	●
	Nonferrous Product Producers	331421	Copper rolling, drawing, and extruding	1	●	○	○	●
		331315	Aluminum sheet, plate, and foil manufacturing	2	●	○	○	●
		331316	Aluminum extruded product manufacturing	1	●	○	○	●

**Table 2- 2: NAICS Categories Associated with the RRR Industry and Status of Contact Information**

Recycling Category <sup>1</sup>	NAICS CODE <sup>2</sup>	NAICS Code Description <sup>2</sup>	Total Identified Facilities by NAICS Code <sup>3</sup>	Facility Contact Information Researched			
				Facility Name	Key Contact	Email	Phone
Nonferrous Foundries	331521	Aluminum die-casting foundries	4	●	○	○	●
	331522	Nonferrous (except aluminum) die-casting foundries	2	●	○	○	●
	331524	Aluminum foundries (except die-casting)	3	●	○	○	●
	331525	Copper foundries (except die-casting)	2	●	○	○	●
Paper & Paperboard Mills/Deinked Market	322299	Other Converted Paper Product Manufacturing	4	●	○	○	●
Pavement Mix Producers	324121	Asphalt paving mixtures and blocks	14	●	○	○	●
Plastics Reclaimers	325991	Custom Compounding of Purchased Plastics Resins	7	○	○	○	○
Plastic Converters	3261	Plastic Product Manufacturing	163	○	○	○	○
Rubber Product Manufacturers	3262	Rubber Product Manufacturers	11	●	○	○	●
Iron and Steel Manufacturers	331111	Iron and Steel Mills	5	●	○	○	●
Computer & Electronic Appliance	411690	Other Electronic Parts and Equipment Wholesale	243	●	●	●	●

**Table 2- 2: NAICS Categories Associated with the RRR Industry and Status of Contact Information**

Recycling Category <sup>1</sup>		NAICS CODE <sup>2</sup>	NAICS Code Description <sup>2</sup>	Total Identified Facilities by NAICS Code <sup>3</sup>	Facility Contact Information Researched			
					Facility Name	Key Contact	Email	Phone
	Demanufacturers	811212	Computer & Office Machine Repair and Maintenance	118	●	●	●	●
	Motor Vehicle Parts	423140	Motor vehicle parts (used) merchant wholesalers	21	●	○	○	●
Reuse & Re-Manufacturing	Retail Used Merchandise Sales	45331	Used Merchandise Stores (excluding pawn shops)	391	○	○	○	○
	Tire Retreaders	326212	Tire Retreaders	4	●	●	●	●
	Wood Reuse	32192	Wood Container and Pallet Manufacturing	24	●	●	●	●
	Materials Exchange Services	54199	All Other Professional, Scientific, and Technical Services	437	○	○	○	○
	Other Reuse	423840	Wholesale Machinery, Equipment, and Supplies	116	●	●	●	●
<b>Total Potential RRR Facilities in Colorado</b>				<b>1,906</b>				
Sources:	<sup>1</sup> R.W. Beck, Inc. 2001. U.S. Recycling Economic Information Study. Prepared for The National Recycling Coalition. <sup>2</sup> U.S. Census Bureau. North American Industry Classification System. 2012. Available online at: <a href="https://www.census.gov/eos/www/naics/">https://www.census.gov/eos/www/naics/</a> <sup>3</sup> U.S. Census Bureau. County Business Patterns. 2011. Available online at: <a href="http://www.census.gov/econ/cbp/">http://www.census.gov/econ/cbp/</a>							
Key:	○ No information identified through research by ENVIRON ● Some information identified through research by ENVIRON.							

Table 2-3 provides an overview of the sources of contact information ENVIRON has compiled for the study. This table includes the information that was secured from each of the data sources, and was used to develop the results of the data gaps identification provided in Table 2-2.

<b>Table 2-3: Data and Information Sources</b>		
<b>Source of Colorado RRR Firm Information</b>	<b>Description of Online Data Available</b>	<b>Website</b>
Carpet America Recovery Effort (CARE) Databases	Map of CARE Certified Collectors	<a href="http://www.carpetrecovery.org/collect-or-finder/index.html">http://www.carpetrecovery.org/collect-or-finder/index.html</a>
Construction Materials Recycling Association	List of C & D Recyclers	<a href="http://www.cdrecycling.org/index.php?option=com_community&amp;view=search&amp;task=usersearch">http://www.cdrecycling.org/index.php?option=com_community&amp;view=search&amp;task=usersearch</a>
Institute of Scrap Recycling Industries /R2RIOS	Company search by State	<a href="http://store.isri.org/web/Custom_Directories/Company_Search.aspx">http://store.isri.org/web/Custom_Directories/Company_Search.aspx</a>
e-Stewards	List of e-Steward Certified Electronic Recyclers by State	<a href="http://www.e-stewards.org/find-a-recycler/">http://www.e-stewards.org/find-a-recycler/</a>
Asphalt Recycling & Reclaiming Association	Member Directory	<a href="http://www.arra.org/members/?listpage=1&amp;member_search=&amp;short_search=&amp;s_company=&amp;s_work=&amp;s_state=&amp;s_country=&amp;s_status=&amp;s_service=&amp;krissoff-search=">http://www.arra.org/members/?listpage=1&amp;member_search=&amp;short_search=&amp;s_company=&amp;s_work=&amp;s_state=&amp;s_country=&amp;s_status=&amp;s_service=&amp;krissoff-search=</a>
Reusable Industrial Packaging Association	Member Directory	<a href="http://www.reusablepackaging.org/find-a-member/search-results/?comp_state=CO">http://www.reusablepackaging.org/find-a-member/search-results/?comp_state=CO</a>
Colorado Asphalt Pavement Association	Member Directory	<a href="http://co-asphalt.com/who_is_capa/membership_directory.htm">http://co-asphalt.com/who_is_capa/membership_directory.htm</a>
Colorado Association for Recycling	Member Directory	<a href="http://www.cafr.org/members/directory.php">http://www.cafr.org/members/directory.php</a>
Colorado List of Registered Electronics Recyclers	Online list of registered electronic recyclers in Colorado	<a href="http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251615964355">http://www.colorado.gov/cs/Satellite/CDPHE-HM/CBON/1251615964355</a>
BioCycle	Registered Compost Facilities and Locations	<a href="http://www.findacomposter.com/listing/location/united-states/colorado">http://www.findacomposter.com/listing/location/united-states/colorado</a>
Yellow Pages	Search for Facilities within an Industry by State	<a href="http://www.yellow.com/">http://www.yellow.com/</a>

## 2.5 Data Gaps

As discussed previously, two types of information are needed to carry out this analysis: 1) specific economic data for the business categories identified, and 2) contact information for



RRR businesses so that they may be surveyed or interviewed. Following the outline of needed information in Section 2.3 and the available information described in Section 2.4, it is evident that there are significant data gaps related to both types of information.

Table 2-3 illustrates the available data obtained and the data gaps ENVIRON identified through its research. The sectors with the most significant economic data gaps that will need to be addressed in the next phase of this study include:

- Solid Waste Collection – Private
- Compost and Organic Producers
- Materials Recovery Facilities
- Glass Container Manufacturing Plants
- Nonferrous Secondary Smelting and Refining
- Nonferrous Product Producers
- Nonferrous Foundries
- Paper and Paperboard Mills/Deinked Market

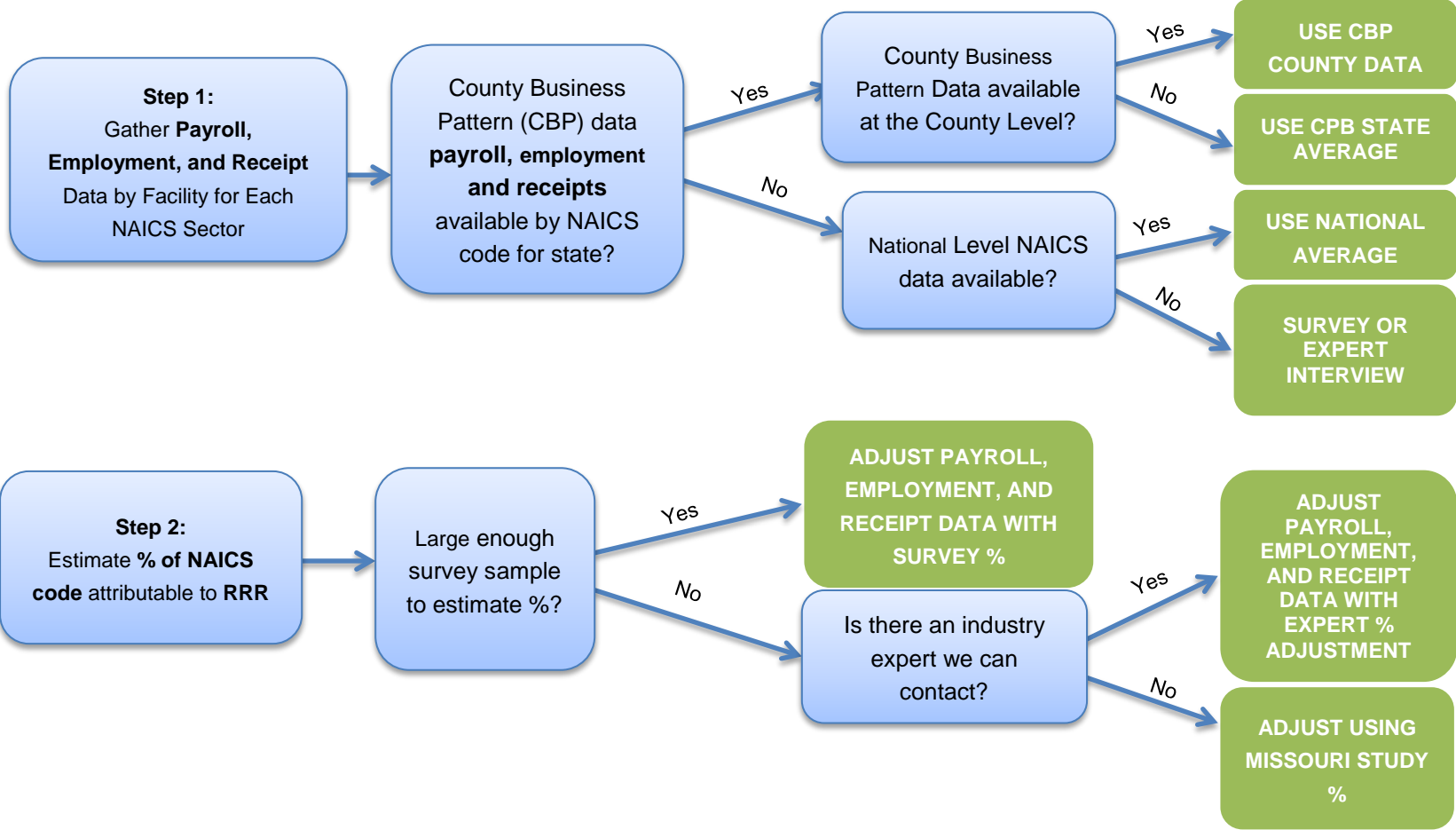
These sectors have data reported for the number of facilities, but the more specific information on jobs, income, and payroll are not reported.

The sectors with the most significant contact information gaps include:

- Glass container manufacturing plants
- Plastics reclaimers
- Plastic converters
- Retail used merchandise sales; and
- Materials exchange services

Several of these sectors have a large number of identified facilities by NAICS code.

ENVIRON's plan to collect and compile both the remaining economic data and share of the business sectors involved in the RRR industry is illustrated in Figure 2-1. The most reliable and accurate data would come from the County Business Patterns. The county-level are the preferable data to use, if available, and if not, the alternative approach is to use state level average data. If no state level data are available, national level average data is the third choice. If no national level data is available for the business sector, ENVIRON will need to rely on survey data or interviews with experts in the industry.



**Figure 2-1: Flow Chart for Data Collection**

The second step is to estimate the percentage of RRR activity within each business sector. If the results of the web-based survey provide a large enough survey sample to estimate the percent, ENVIRON will adjust the payroll, employment, and receipt data with the survey percent for the business sector. If the survey sample is not large enough to estimate the RRR percentage for the sector, ENVIRON will adjust the payroll, employment, and receipt data using information from an industry expert, if available. Otherwise ENVIRON will use the percentages included in the Missouri Study (Valentine 2005). Following this flow chart will allow ENVIRON to use the best available information in its assumptions, estimates, and analysis.

## 2.6 Summary and Conclusion

This chapter highlights the data needs for conducting an accurate analysis of economic impacts of recycling in Colorado, efforts to research that information through secondary sources, data available through such sources, and the information gaps. Two types of information is sought in order to proceed with the study:

- Specific firm-level economic data, including annual revenues, numbers of employees, payroll amounts, amounts paid in taxes, and percentages of the businesses' activities associated with RRR
- Contact information for firms within each specific business category identified in Table 2-2 for conducting a web-based survey and interviews.

Significant data gaps are identified for both these categories following a secondary research effort. The economic data for the analysis would be collected through firm-level surveys and interviews of RRR industry representatives. However, the success of that effort weighs heavily on the accuracy and completeness of the names and contact information for these firms, as well as the response rate.

The Department and other members of the research team can assist in ensuring the success of this data gathering process in three ways:

- Provide accurate and complete lists of the names of firms under within each business category outlined in Table 2-2, along with addresses, key contacts' names, key contacts' roles/titles, key contacts' telephone numbers, and key contact's email addresses. Although this information is needed for all business categories, the categories for which ENVIRON was unable to locate any contact information are the most critical: glass container manufacturing plants, plastics reclaimers, plastic converters, retail used merchandise sales, and materials exchange services.
- Identify key RRR industry representatives for telephone interviews, preferably for each business category identified in Table 2-2. Such personnel could be representatives of coalitions and organizations representing the industry, or heading a larger operation within a business category.
- Send out letters to the firm contacts, as well as industry representatives, prior to the initiation of the process. Such letters should cover the purpose of the study, its benefits for the RRR industry, and how the response of the recipient could play a key role in the accuracy of results. The letter could also contain a link to the online survey, in case the industry

representatives want to forward it to the firms themselves for a better response. A sample letter is attached as Appendix B of this document.

### 3 Survey Plan

As a first step, ENVIRON developed a data gap analysis, which was presented to, and reviewed by, the Department. Based on the gaps identified, the Department provided additional business categories and contact information for the RRR industries in the State. ENVIRON finalized the list of relevant firms and their contact information in order to initiate the survey process. This chapter outlines the plan to conduct the survey, including the approach to followed, the sampling plan, and the survey instrument. This chapter was originally developed as a separate report, and has been reformatted to become a chapter of this larger report, although most of the text has not changed since it was originally presented.

The remainder of the chapter identifies and presents the survey plan with the following layout:

- Section 3.1 identifies the purpose and need for the survey plan.
- Section 3.2 provides the details of the approach and methodology to be followed for conducting the survey.
- Section 3.3 identifies the sampling plan.
- Section 3.4 summarizes the layout and contents of the survey instrument.
- Section 3.5 summarizes the discussion presented in the chapter.

#### 3.1 Purpose and Need

The methodology to be used to identify economic impacts of waste diversion on the State of Colorado requires significant and specific data to be collected from available sources. The Data Gap Analysis was the first step in the process. Through the Data Gap Analysis, ENVIRON determined what data and information is currently available from known secondary sources, and what data will be necessary to obtain through surveys, interviews, and other methods. This survey plan is the second step in the analysis process, and its purpose is to outline the procedure and expectations of the survey process. Based on the type of information to be collected through a survey and the number and types of firms identified, ENVIRON has developed this survey plan comprising the survey methodology, recommended sampling strategy, and the survey instrument.

### 3.2 Approach and Methodology

Conducting the analysis of economic impacts related to recycling activities in Colorado requires certain direct economic data specific to each RRR firm identified (or at least a representative sample of firms within each business category) to be collected. In addition to the business categories mentioned in the Data Gap Analysis chapter, firms in the NAICS codes shown in Table 3-1 will be added to the analysis.

<b>NAICS</b>	<b>Definition</b>	<b>Total No. of Firms</b>
321920	Wood Container and Pallet Manufacturing	14
326122	Plastics Pipe and Pipe Fitting Manufacturing	4
326150	Urethane and Other Foam Product (except Polystyrene) Manufacturing	5
326191	Plastics Plumbing Fixture Manufacturing	4
326199	All Other Plastics Product Manufacturing	104
326211	Tire Manufacturing (except Retreading)	5
326220	Rubber and Plastics Hoses and Belting Manufacturing	2
326291	Rubber Product Manufacturing for Mechanical Use	1
326299	All Other Rubber Product Manufacturing	12
327213	Glass Container Manufacturing	5
331110	Iron and Steel Mills and Ferroalloy Manufacturing	46
331318	Other Aluminum Rolling, Drawing, and Extruding	10
331523	Nonferrous Metal Die-Casting Foundries	7
423690	Other Electronic Parts and Equipment Merchant Wholesalers	458
453310	Used Merchandise Stores	362
541990	All Other Professional, Scientific, and Technical Services	594
562920	Materials Recovery Facilities	3

While some economic information is available through secondary sources, these data will be primarily collected through a survey effort. In general, data to be collected through the survey include locations of the facilities, annual revenues, numbers of employees, payroll amounts, amounts paid in taxes, and percentages and types of the businesses' activities associated with RRR.

The survey will be conducted using the online survey tool "Survey Monkey." Survey recipients will be contacted through email with a letter attached on behalf of the Department (see Appendix B). Firms for which email addresses are not readily available will be contacted either through phone calls or via their websites contact pages to obtain valid email addresses. The email will contain a link to the survey, instructions, and a deadline for responding to it. The attached letter will provide some information on the purpose of the exercise and a request for firms to participate.

Following the development of the final contact list for the RRR industry and the survey instrument (see Appendix A), and one week prior to sending out emails to all identified contacts, the survey will be pre-tested using Survey Monkey by requesting six contacts to complete the survey. Based on the results of the pre-test, the survey instrument will be modified, if needed, finalized, and re-posted on Survey Monkey. Directly following survey modifications due to results from the pre-test, the ENVIRON team will be operating a booth at the Colorado Association for Recycling Summit (June 9 and 10, 2014) to make initial contact with relevant firms attending the summit, and the survey will be available on a laptop at the booth for completion by anyone who would like to participate in the survey at the summit.

As discussed in more detail later in Section 3.4, the survey instrument will include a qualifying question to determine if the firm is part of the RRR industry. That question will help filter out firms which indicate they are not involved in the RRR industry, thus ensuring that the impacts are not over estimated in the analysis.

The process used to obtain both accurate and measurable responses to the survey will involve a two contact approach. Approximately three weeks after emailing the links to the survey, the ENVIRON team will attempt to reach the contact persons for each non-responding firm by email or phone. If the effort is successful and the identified contact persons are reached, the contact information will be confirmed and the recipient will be encouraged to complete the survey online as soon as possible. A systematic protocol will be used to explain objectives of the survey and obtain accurate information from the recipient. If ENVIRON is unsuccessful in reaching the contact persons, the team will attempt to leave messages for the identified individuals. Another round of follow-ups through emails or phone calls will be carried out two weeks after the first round. Overall, ENVIRON will attempt to reach the targeted survey recipients at least two times before considering companies as non-respondents. Approximately seven weeks after the survey is posted for all contacts, the ENVIRON team will review the list of respondents to identify processors and end-users who have not responded. From that list, ENVIRON and the Department will try once more to contact the RRR firms handling large quantities of materials, or in locations not yet represented, to obtain the needed data. The objective of this final attempt will be to gather data from those entities considered to play a "significant" role in recycling in Colorado and to complete location-specific data collection.

During the survey process, the ENVIRON team will continue to review the surveys as they are received for completeness and accuracy. In case there are clarifications needed or missing information on any response, the relevant contact person will be contacted via email or phone call to ensure the accuracy of the information.

Following the completion of the survey process, ENVIRON will compile all data in an MS Excel spreadsheet for analysis.

### **3.3 Sampling Plan**

The number of firms requested to participate in the data collection survey process will be determined based on the total number of firms under each NAICS code and the percent of total, or total, number of firms identified with contact information obtained. Sampling for the survey will be based on a random sample of 60 percent of each of the NAICS code sectors for which 80 to 100 percent of the firms have been identified and contact information obtained. Sampling of NAICS codes for which less than 80 percent of the firms have been identified and contact information obtained will be based on a random sample of 80 percent of the identified firms. The goal is to have full representation of business categories, sizes of RRR firms, and locations. Sampling will not be done for sectors which either have five or fewer firms in total or for which contact information for five fewer firms is obtained. Under those conditions, all identified firms will be contacted and asked to participate in the survey. After initial contact, follow-up contact may target specific firms who have not yet responded in order to achieve representation of all business categories, all sizes of firms, and all locations. It should be noted that some NAICS codes with only one or two firms may not be represented in the survey results. If all NAICS codes are represented using 60 percent random sampling, over 2,000 firms will be asked to participate in the survey. If a 50 percent response rate is achieved, results will be provided for over 1,000 total RRR firms. This sampling plan is subject to modification if smaller than expected number of firms are available to participate in the survey.

### **3.4 Survey Instrument**

The survey instrument developed to collect data from RRR firms in Colorado includes initial questions identifying the firm name and location as well as information about the person who is completing the survey. The next set of questions requests information regarding the amount and type of RRR work the firm is engaged in and in which counties the company provides services, followed by a group of questions to obtain the company financial and employment data necessary for the analysis.

A copy of a draft of the survey instrument is provided as Appendix A.

### **3.5 Summary**

This survey plan has been developed to provide the Department with an understanding of the approach and methodology of the on-line survey process, how the sampling will be conducted, and what the survey instrument will look like. This is the next step in determining the economic impact analysis of the RRR industries in the State of Colorado. Once the survey plan is approved by the Department, the survey process will be initiated and the necessary data will be collected and compiled for analysis.

Following an initial pre-test, the survey will be conducted online using Survey Monkey, with the recipients informed through emails and phone calls. Two follow-ups will be conducted with firms that do not initially respond, with a third follow-up only with larger firms or those in a location that ENVIRON did not receive sufficient responses from. In terms of sampling, 60 percent random sampling will be carried out for NAICS business sectors for which 80 to 100 percent of the firms



are identified and their contact information obtained. However, in case of sectors which either have five or fewer firms in total or identified, or for which contact information for five fewer firms is obtained, no sampling will be done and all identified firms with contact information will be contacted. The survey instrument is provided in Appendix A.

## 4 Data Collection

This chapter presents the survey methodology that was applied, the response, and results of the survey. The data collection chapter was originally presented as a stand-alone report to the Department, and has been formatted and laid out to become a chapter of this larger report. This chapter has undergone a technical review since it was originally presented to the Department, and departmental comments have been addressed.

The remainder of the chapter identifies and presents the methodology used, the response, and results with the following layout:

- Section 4.1 identifies the purpose and need for this chapter.
- Section 4.2 provides the details of the approach and methodology that was followed for conducting the survey. This section also includes a discussion of the sampling, and a description of layout and contents of the survey instrument.
- Section 4.3 summarizes the overall results of the survey and also provides information on the response rate. It has two sub-sections; Sub-section 4.3.1 discusses the survey results by NAICS code, while Sub-section 4.3.2 presents the detailed results of the survey by question.
- Section 4.4 summarizes the discussion presented in the chapter.

### 4.1 Purpose and Need

The methodology to be used to identify economic impacts of waste diversion on the State of Colorado requires significant and specific data be collected from available sources. The Data Gap Analysis was the first step in the process. Through the Data Gap Analysis, ENVIRON determined what data and information are currently available from known secondary sources, and what data will need to be gathered through surveys, interviews, and other methods. The second step in the analysis was the Survey Plan, which outlined the procedure and expectations of the survey process. This chapter, which reports the results of the survey, is the third and a key step in the process. It provides pertinent economic and other information regarding the RRR industry in Colorado.

### 4.2 Approach and Methodology

ENVIRON followed the general methodology outlined in the Survey Plan to conduct the online survey. A spreadsheet was created with RRR contacts from a variety of entities and locations throughout the state. This included information supplied by CDPHE and that obtained through research by ENVIRON. Using the contact information from the spreadsheet, ENVIRON attempted to obtain more current contact information (including email addresses) for as many contacts as possible. During a period of a few weeks, over 50 RRR entities were contacted via telephone to obtain the contact information or, where relevant, get a current contact person's name and email address. Following the initial effort to obtain updated contact information, over 150 RRR entities throughout Colorado were contacted via email to participate in the survey.

Approximately two weeks after emailing the link to the survey, the ENVIRON team attempted to reach the contact person for each non-responding entity by email and/or phone. After a contact

was reached, the ENVIRON team encouraged each contact to complete the survey. If a contact could not be reached, a voicemail message was left with information about the survey and how to contact an ENVIRON team member if they had any questions or concerns. Approximately two weeks after the first round to reach contacts, another round of follow-up emails and phone calls was carried out.

ENVIRON attempted to contact the targeted survey recipients at least two times before considering those entities as non-respondents. Approximately seven weeks after the survey was posted for all contacts, the ENVIRON team reviewed the list of respondents to identify processors and end-users who had not responded. From that list, ENVIRON and the Department tried once more to contact the RRR entities handling large quantities of materials, or in locations not yet represented, to obtain the needed data.

Throughout this data collection effort, the ENVIRON team tracked all attempts to contact RRR entities in the RRR contact spreadsheet (previously mentioned). That spreadsheet identifies the entities that have completed the survey and those that declined to participate, or were uncooperative.

#### **4.2.1 Sampling**

As discussed in the Survey Plan, the number of entities requested to participate in the data collection survey process was to be determined based on the total number of entities under each NAICS code and the percent of total, or total, number of entities identified with contact information obtained. As per the Survey Plan, it was decided that sampling would not be done for sectors which either have five or fewer entities in total or identified, or for which contact information for five fewer entities is obtained. Under those conditions, all identified entities would be contacted and asked to participate in the survey. While collecting the names of entities and their contact information, it was determined that there were overlaps between NAICS codes, and for many of the entities, it was not clear what their primary operations were. A question in the survey instrument gives the option to the respondent to select a NAICS Code that the entity falls under. Also, given that the survey was to be conducted online, it was possible to send out the survey to more entities efficiently and without incurring too much additional expense. Therefore, all entities for which contact information was collected were sent the link to the survey in an email.

#### **4.2.2 Survey Instrument**

The survey instrument used to collect data from RRR entities in Colorado included initial questions identifying the entity name and location, as well as information about the person who completed the survey. The next set of questions requested information regarding the amount and type of RRR work the entity was engaged in, and in which counties the company provided services, followed by a group of questions to obtain the company financial and employment data necessary for the analysis, and another group of questions regarding locations of suppliers and processors.

A copy of survey instrument is used provided as Appendix A.

### 4.3 Survey Results

By the time the online survey was officially closed, 75 survey responses were received out of a total of 642 surveys sent, with an overall response rate of 12%. The respondents are from a variety of entities ranging from landfills to electronic recycling sites, and include both public and private entities. 50% of the survey respondents identified themselves as a Collector/ Hauler, with Processors slightly lower at 49%, followed by 11% each for Manufacturers and Remanufacturers, 10% as a Reuser, 8% as a Broker, and 22% as Other. The Reuse and Remanufacturing sector represented by the survey participants comprises industries such as computer and electronic appliance remanufacturing, equipment or toner cartridge remanufacturer motor vehicle part manufacturer, retail used merchandise sales, and wood reuse or pallet rebuilder. The Other Recycling Entities include education/ research, organizer of collection sites, consultant, landfill, processing for community activities, trade association, drop off site, regulatory agency, equipment dealer, de-manufacturing, and various collection activities. Several interesting pieces of information stand out from reviewing the complete survey results. Many of these are highlighted briefly here, with the full detailed results found in Section 4.3.2.

It is interesting to note that survey responses were received from entities operating in nearly all Colorado counties (Question #7). Another very interesting result of the survey is that while nearly 80 percent of entities do business within the State of Colorado, nearly 69 percent do business outside the State (Question #21), and more than 70 percent know or believe that there is a demand for recycled materials in Colorado (Question #23). Further, and most likely related to doing business outside of Colorado, respondents indicated a large number of miles traveled both to collect recycled materials and to move materials for processing, with nearly 60 percent traveling over 50 miles and nearly 30 percent traveling more than 100 miles to collect recycled materials (Question #24) and, on average, moving materials for processing more than 100 miles to 16 facilities and to 8 facilities less than 50 miles. It is interesting to note that only 31 percent of respondents partner with local Colorado manufacturers to use recycled materials for their manufacturing needs, indicating potential for further education, outreach, and partnering within the RRR industry in the State of Colorado.

Other pertinent results of the survey show that of the 75 respondents, the majority self-identified themselves as collector/hauler or processor within the recycling industry. Additionally, the recycling industry in Colorado employs, on average, 58 full time employees and 14 part-time employees, working an average of 14 hours per week (Questions # 14, 15, and 16, respectively). Further, the data collected from the survey respondents appears to contribute positively to the Colorado economy by providing salaries primarily within the range of \$15,000 to \$25,000, with the next largest number of employees in the salary range of \$25,000 to \$50,000 (Question #18).

#### 4.3.1 Survey Results Summary by Sector and NAICS Code

The survey included a question to identify, where possible, the NAICS codes each respondent was associated with (Question #6). Of the 75 respondents, 46 identified their NAICS codes, while 29 respondents skipped this question. The number of responses from each of the following NAICS codes (some respondents included more than one NAICS code) is shown in Table 4-1.

This section summarizes the responses received by NAICS code for specific questions (4, 9, 14, 15, 17, and 19, where appropriate). While a summary for each NAICS code for each question is not included, a selection of questions and NAICS codes are provided in Table 4 -1. Some of the summary results are not disclosed due to low response rates, resulting in propriety concerns relative to keeping individual data confidential. These results are indicated by \*D in Table 4-1.

The greatest number of responses to Question #6 came from respondents identifying as a part of NAICS code 562920, Recycling Processing-Materials Recovery Facilities-Materials Recovery. This industry sector is also one of the two largest in terms of average number of employees and total average payroll. The other is 423930, Recycling Processing- Recyclable Materials Wholesalers-Recyclable Materials Wholesalers. Further, responses for these two sectors indicate a large percent of their business activities are related to the RRR industry, 92 percent and 96 percent, respectively. The majority of these NAICS codes indicate a significantly larger share of business practice applicable to private recycling collection. The three NAICS codes with a business practice applicable primarily to government recycling collection are 562111, Recycling Collection- Government Staffed-Solid Waste Collection; 325314, Recycling Processing-Compost & Organic Producers-Fertilizers; and 541990, Reuse & Re-Manufacturing – Materials Exchange Services-All Other Professional, Scientific, and Technical Services.

Table 4-1a provides an overview of the average percent of the NAICS code (or sector) within each business category that is dedicated to recycling, For example, for those who identified as Collector/Hauler and whose business falls under the NAICS code 592920, 35 percent of the business activities are related to recycling. As another example, for those who identified as a Processor and whose business falls under the NAICS code 562112- Recycling Collection- Private Staffed, 14 percent of all business activity is related to recycling. The highest percentage of recycling activities within any of the business categories for any of the NAICS codes is for Brokers in the NAICS code 562920- Recycling Processing- Materials Recovery Facilities, with 80 percent. The second highest is 67 percent, which is a tie between the “Other” business category (which may include entities such as consultants, trade organizations, organizers, education, and research), NAICS code 562111- Recycling Collection- Government Staffed, and the Reuser category for NAICS code 562920. The other high percentage of recycling activities falls under those identified as Processors, also in the NAICS code 562920. Remanufacturing reported 40 percent recycling activities for three of the five NAICS codes represented by that business category. The other business categories reported between three and 35 percent recycling activities for reported NAICS codes. Further details of the survey responses by business category are included as Appendix D

Table 4-1a also presents an insight on the importance of each business category as it relates to a specific NAICS code. This table shows that the collector/haulers and processors each have recycling activities under 10 of the 13 NAICS codes identified in the survey, with three and five of those, respectively, near or above 30 percent. This may indicate broad recycling activities for these business categories, with the potential to expand under all or most of those NAICS codes. The manufacturer category indicates recycling activities under six of the 13 NAICS codes, each with 25 percent, providing potential growth within each. Remanufacturer, Broker, and Reuser each identify recycling activities under only five of the 13 NAICS codes, but most of the

percentages are above 30 percent and up to 80 percent, with the remaining sectors at 20 percent. This may provide opportunity for concentration of activities within those specific areas, or alternatively, attempting to discover why there isn't activity within the other sectors and pursuing growth in those sectors if appropriate.

**Table 4-1: Summary of Survey Results by NAICS Code**

NAICS Code	4. Average percent of business activities related to recycling industry	6. Number of respondents from each NAICS code	9. Average percent of business practice applicable to Gov't / Private Recycling Collection	14. Average number of full-time employees	15. Average number of part-time employees	17. Average total payroll in 2013	19. Average total recycling revenue
562111 (Recycling Collection-Gov. Staffed)	44%	11	58% / 7%	4	2	\$168,200	\$57,600
562112 (Recycling Collection- Private Staffed)	64%	9	6% / 65%	29	1	\$74,100	\$186,700
325314 (Recycling Processing-Compost &Organic Producers-Fertilizers)	13%	5	51% / 3%	10	1	\$500,000	\$173,000
423930 (Recycling Processing- Recyclable Materials Wholesalers)	96%	8	5% / 78%	222	86	\$9,270,400	\$26,786,600
562920 (Recycling Processing-Materials Recovery)	92%	16	8% / 88%	109	54	\$4,043,300	\$101,600
324121 (Asphalt Paving Mixture and Block Manufacturing)	50%	2	3% / 100%	*D	*D	*D	*D
3261 (Plastic Bag Manufacturing)	100%	2	N/A	*D	*D	*D	*D

**Table 4-1: Summary of Survey Results by NAICS Code**

NAICS Code	4. Average percent of business activities related to recycling industry	6. Number of respondents from each NAICS code	9. Average percent of business practice applicable to Gov't / Private Recycling Collection	14. Average number of full-time employees	15. Average number of part-time employees	17. Average total payroll in 2013	19. Average total recycling revenue
331111 (Iron and Steel Mills)	100%	1	N/A	*D	*D	*D	*D
333316 (Photographic and Photocopying Equipment Manufacturing)	25%	1	N/A	*D	*D	*D	*D
423690 (Other Electronic Parts and Equipment Merchant Wholesalers)	98%	3	0% / 100%	51	5	\$666,700	*D
811212 (Computer and Office Machine Repair and Maintenance)	98%	2	10% / 90%	*D	*D	*D	*D
453310 (Used Merchandise Stores)	70%	1	5% / 95%	*D	*D	*D	*D
541990 (Reuse & Re-Manufacturing – Materials Exchange Services)	N/A	1	100%/ 0%	*D	*D	*D	*D

\*D = less than 3 entities reporting; not disclosed for propriety reasons



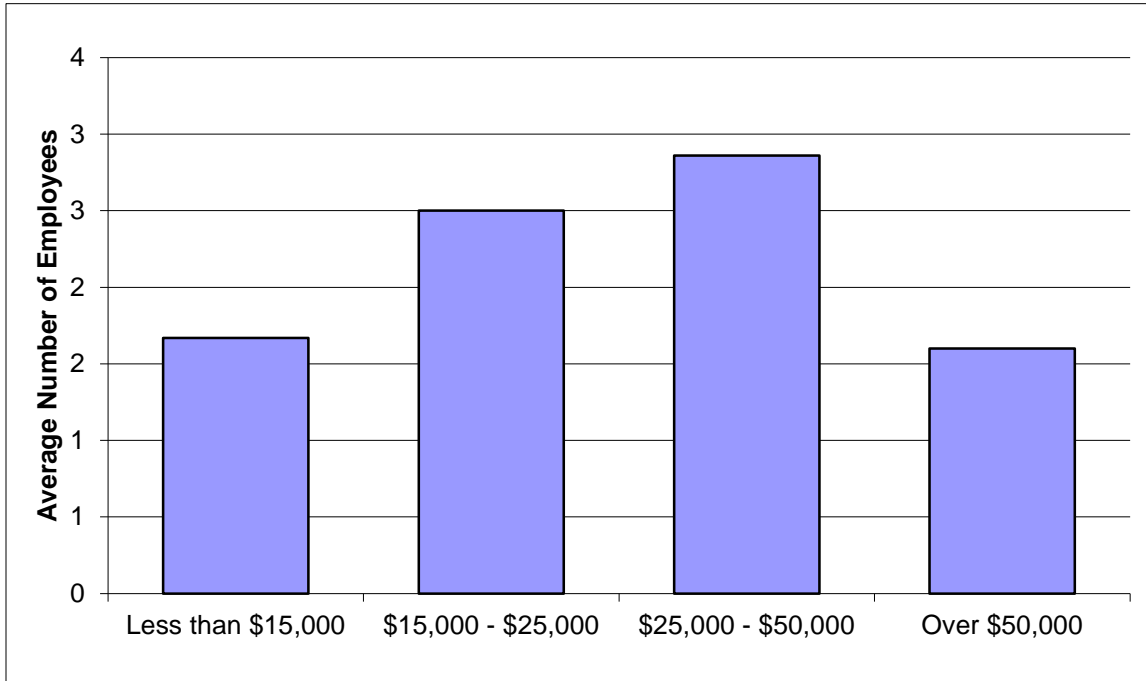
**Table 4-1a – Percent of Business Category Dedicated to Recycling by NAICS Code**

NAICS Codes	Business Categories						
	Collector/ Hauler	Manufacturer	Processor	Remanufacturer	Broker	Reuser	Other
562920- Recycling Processing- Materials Recovery Facilities	35%	0%	59%	40%	80%	67%	0%
562111- Recycling Collection- Government Staffed	28%	25%	5%	0%	20%	0%	67%
562112- Recycling Collection- Private Staffed	31%	0%	14%	0%	20%	0%	0%
423930- Recycling Processing- Recyclable Materials	24%	0%	32%	40%	20%	67%	0%
325314- Recycling Processing- Compost	3%	0%	14%	0%	20%	0%	17%
423690- Recycling Manufacturing- Other Electronic	7%	0%	5%	40%	0%	33%	0%
324121- Recycling Manufacturing- Pavement Mix Prods	3%	25%	5%	0%	0%	0%	0%

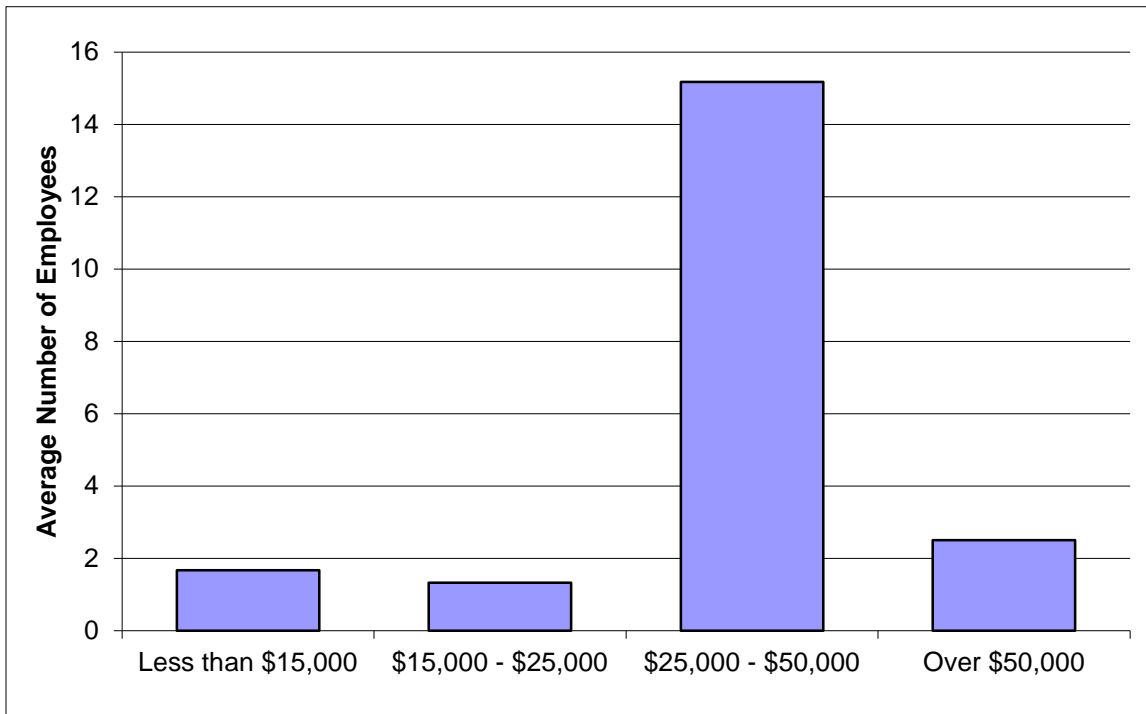
**Table 4-1a – Percent of Business Category Dedicated to Recycling by NAICS Code**

NAICS Codes	Business Categories						
	Collector/ Hauler	Manufacturer	Processor	Remanufacturer	Broker	Reuser	Other
3261- Recycling Manufacturing- Plastic Converters	7%	0%	9%	0%	0%	0%	0%
811212- Recycling Manufacturing- Demanufacturers	3%	0%	5%	20%	0%	33%	17%
331110- Recycling Manufacturing- Iron & Steel Mills	0%	25%	0%	0%	0%	0%	0%
331111- Recyclign Manufacturing- Iron & Stell Mfgs.	0%	25%	0%	0%	0%	0%	0%
333316- Recycling Manufacturing- Nonferrous Product Prods	0%	25%	0%	0%	0%	0%	0%
453310- Reuse & Remanufacturing- Materials Exchange Srvcs	3%	25%	5%	20%	0%	33%	0%

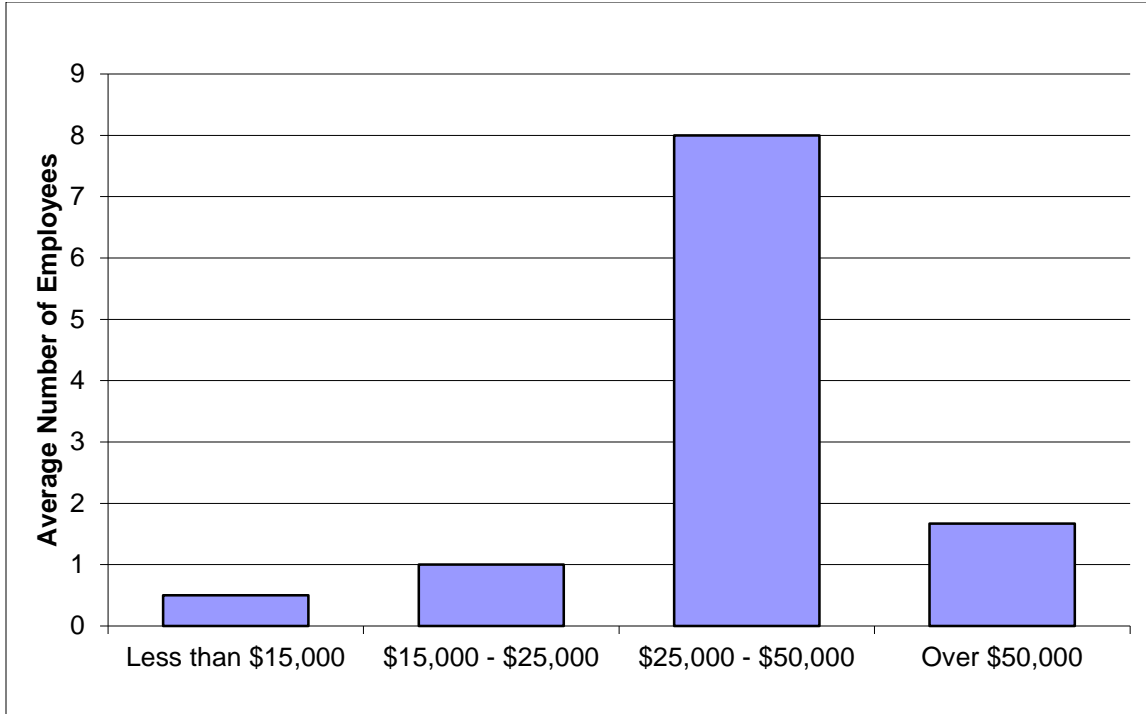
Figures 4-1 through 4-6 illustrate average number of employees within the salary ranges for each of the specified NAICS code for which sufficient data are available.



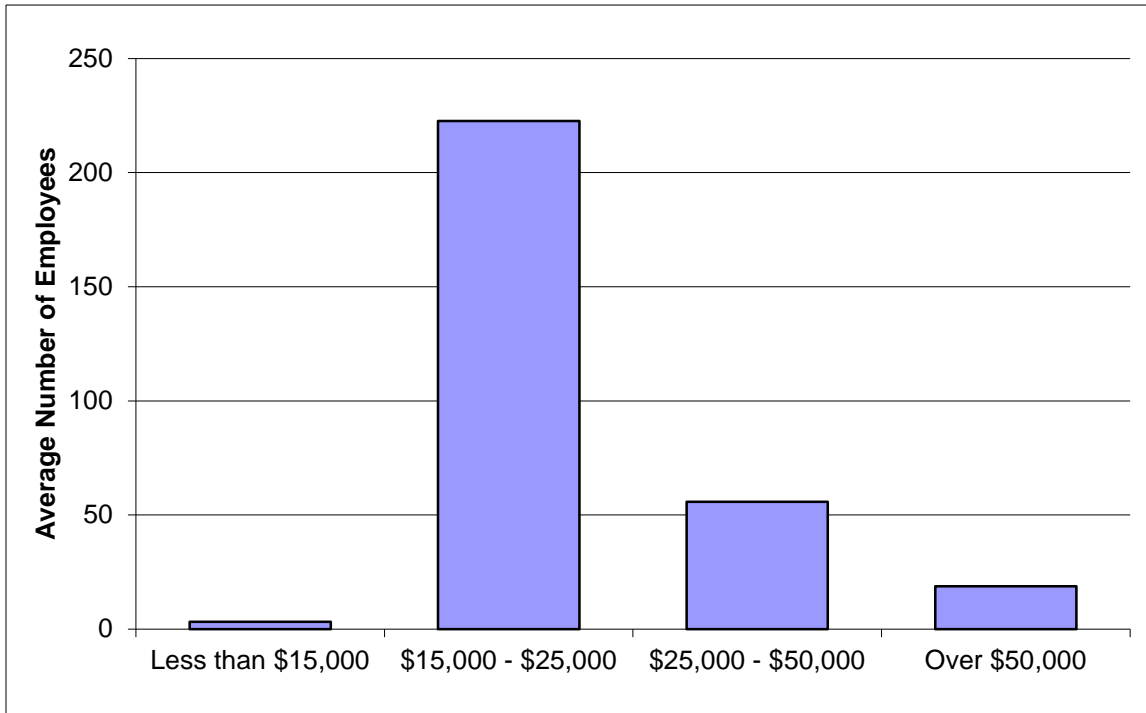
**Figure 4-1: NAICS Code 562111 (Recycling Collection- Government Staffed) – Average Number of Employees within the Specific Salary Ranges**



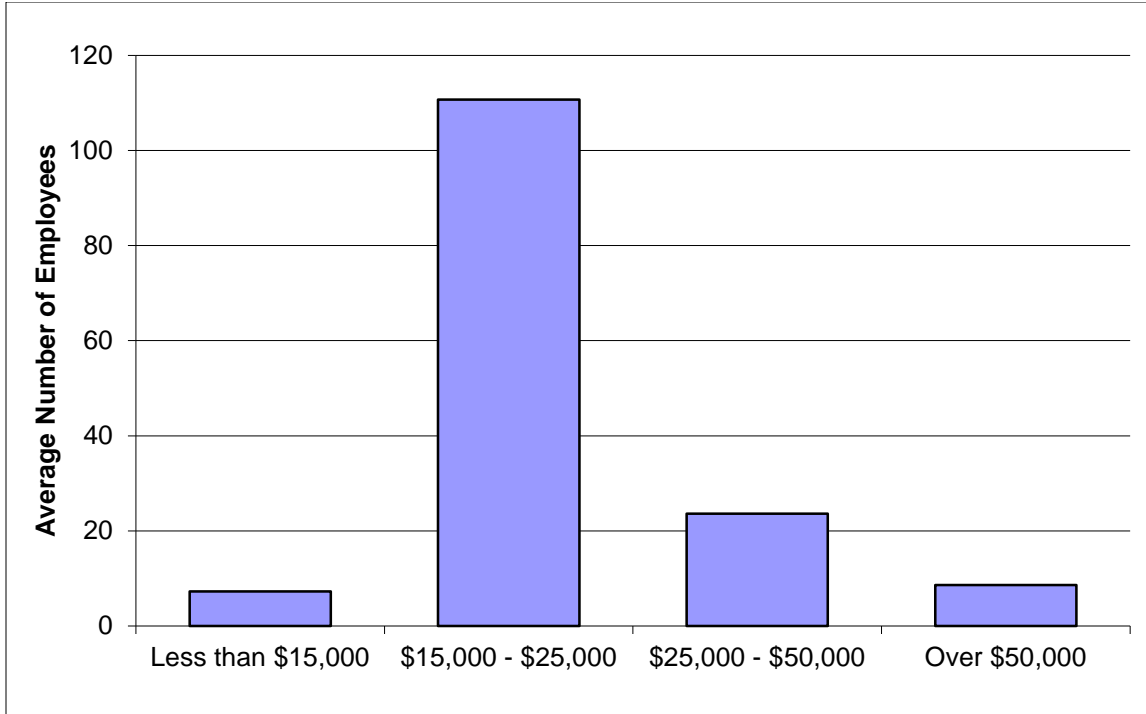
**Figure 4-2: NAICS Code 562112 (Recycling Collection- Private Staffed) – Average Number of Employees within the Specific Salary Ranges**



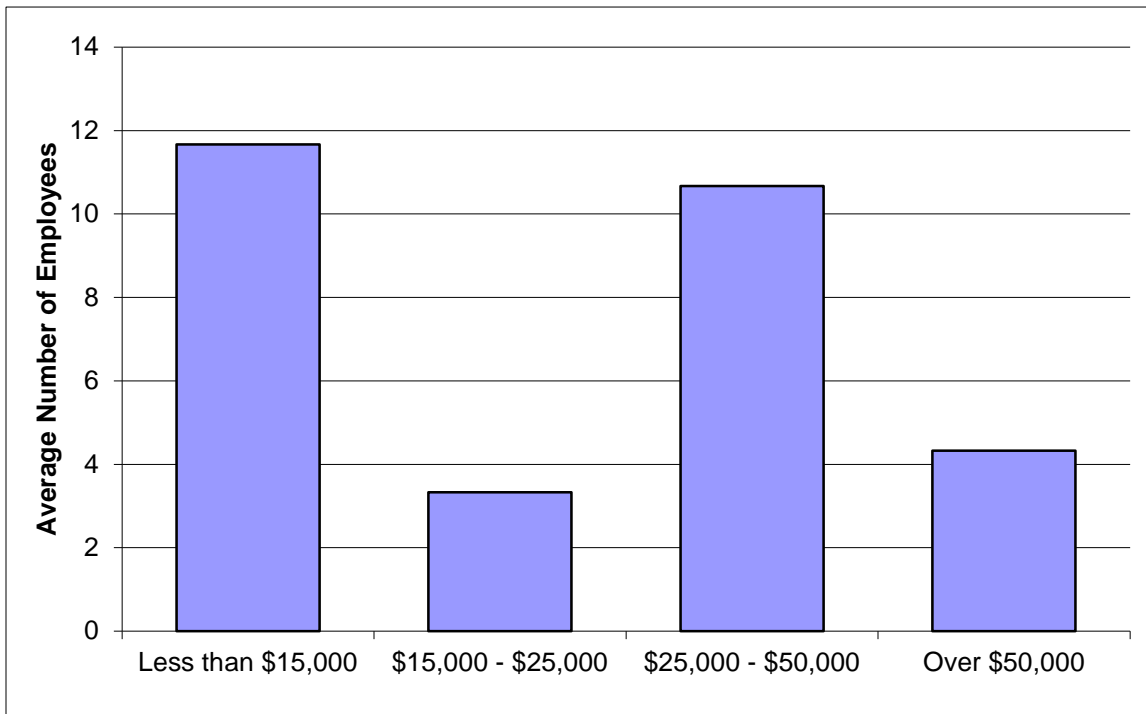
**Figure 4-3: NAICS Code 325314 (Recycling Processing-Compost & Organic Producers-Fertilizers) – Average Number of Employees within the Specific Salary Ranges**



**Figure 4-4: NAICS Code 423930 (Recycling Processing- Recyclable Materials Wholesalers-Recyclable Materials Wholesalers) – Average Number of Employees within the Specific Salary Ranges**



**Figure 4-5: NAICS Code 562920 (Recycling Processing-Materials Recovery Facilities-Materials Recovery) – Average Number of Employees within the Specific Salary Ranges**



**Figure 4-6: NAICS Code 423690 (Other Electronic Parts and Equipment Merchant Wholesalers) – Average Number of Employees within the Specific Salary Ranges**

With the exception of NAICS code 423690, Recycling Manufacturing-Other Electronic Parts and Equipment Merchant Wholesale, which has a large share of employees with a salary of less than \$15,000, all the sectors for which data was provided by a significant number of entities have the largest number of employees within the salary ranges of \$15,000 to \$25,000 and \$25,000 to \$50,000, indicating that, in general, the recycling industry productively contributes to the Colorado economy in terms of providing substantial income. Recycling Collection-Private Staffed-Solid Waste Collection (NAICS code 562112) provides the largest number of jobs with salaries between \$25,000 and \$50,000, with an average of 15 employees per entity.

All of these data will be utilized in the next phase of this study. The economic impact analysis will include the data provided by the responding entities related to employment, income, revenue, and taxes, to the extent that the data have been provided by NAICS code.

#### **4.3.2 Complete Survey Results**

The following is a summary of the complete survey results for all 26 survey questions, along with accompanying tables and figures to highlight the results, where appropriate.

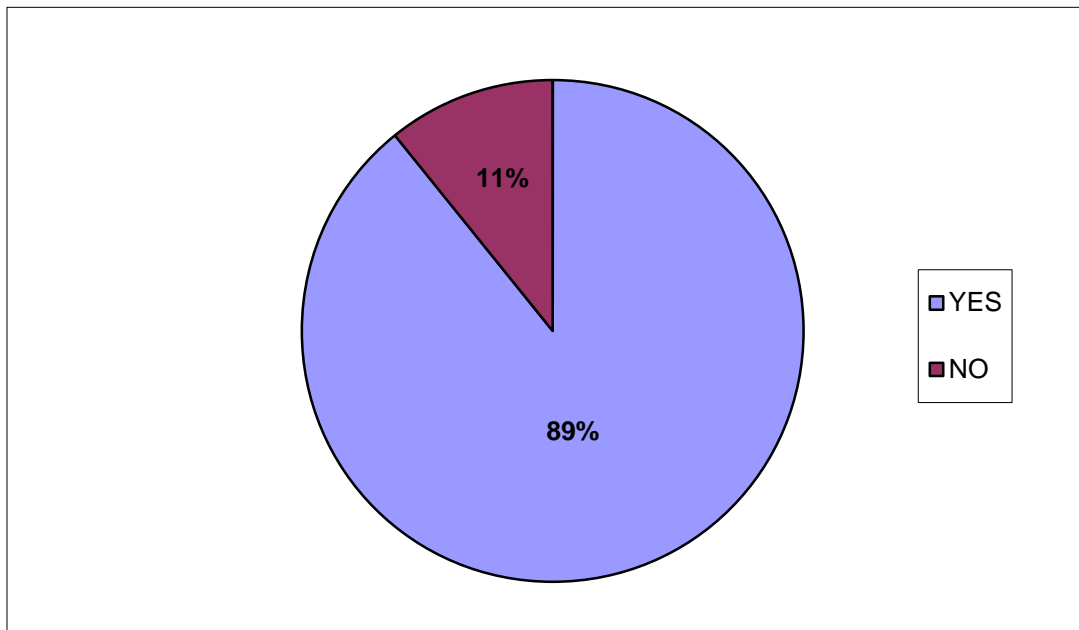
***Question #1: Please provide us the following information about you and your employer for our records and verification. All information will be kept confidential and no individual information will be provided to other parties. CDPHE will not request, or be entitled to see, any individual respondent data. All information will be processed, compiled, and consolidated prior to analysis and distribution, so as not to disclose any individual firm- or site-specific data. Results will only be used once aggregated to industrial sector. If there are multiple locations, please complete a separate survey for each site:***

This question provides a list of survey respondents and their contact information. Due to the confidential nature of the survey data, no individual information is provided.

**Question #2: Is your firm or organization currently involved in the collection, sale, purchase, processing, or use of recycled material on a regular basis? (Table 4-2 and Figure 4-7)**

The majority of survey respondents (over 89%) indicated that their entity is currently involved in the collection, sale, processing, or use of recycled materials on a regular basis. Only 11% indicated that they did not conduct such activities.

<b>Table 4-2: Is your firm or organization currently involved in the collection, sale, purchase, processing, or use of recycled material on a regular basis?</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
YES	89.2%	66
NO	10.8%	8
<i>answered question</i>		<b>74</b>
<i>skipped question</i>		<b>0</b>

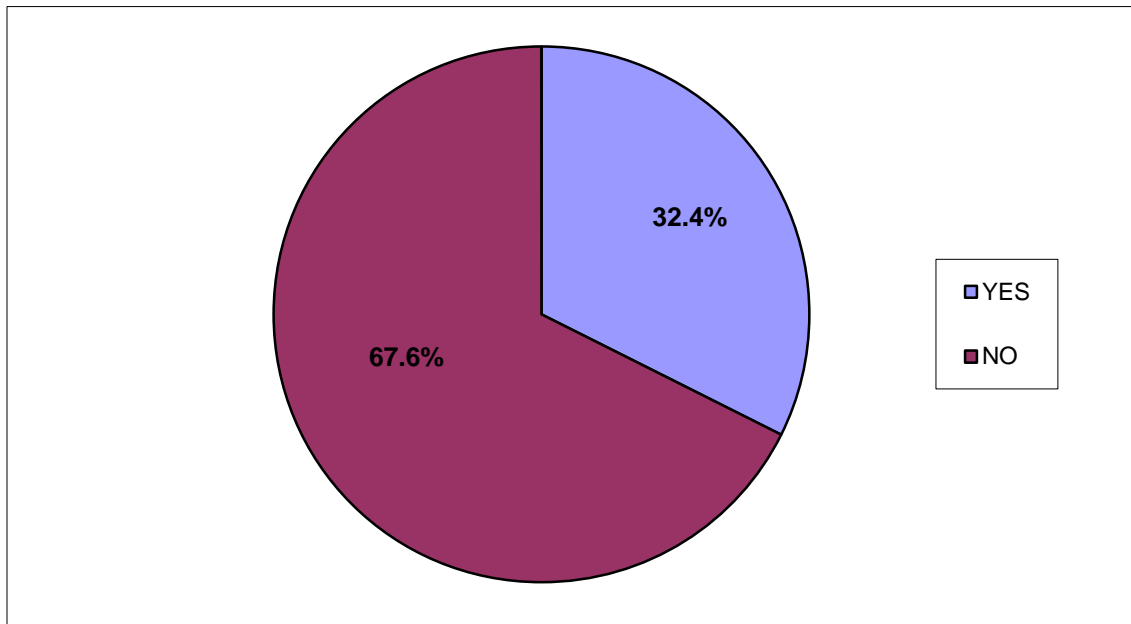


**Figure 4-7: Is your firm or organization involved in the collection, sale, purchase, or use of recycled material on a regular basis?**

**Question #3: Does your firm or organization have multiple sites within Colorado where recycling activities occur? If yes, please be sure to complete a separate survey for each site (this includes all sites for which you are the primary responsible entity) (Table 4-3 and Figure 4-8)**

The majority of survey respondents (almost 68%) indicated that they do not have multiple sites within Colorado. About 1/3 of respondents indicated that they had multiple sites within Colorado.

<b>Table 4-3: Does your firm or organization have multiple sites within Colorado where recycling activities occur? If yes, please be sure to complete a separate survey for each site (this includes all sites for which you are the primary responsible entity)</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
YES	32.4%	24
NO	67.6%	50
<i>answered question</i>		<b>74</b>
<i>skipped question</i>		<b>1</b>



**Figure 4-8: Does your firm have multiple sites within Colorado where recycling activities occur?**

**Question #4: Approximately what percent of the business activities conducted at this site is related to the recycling industry? (If N/A enter zero)**

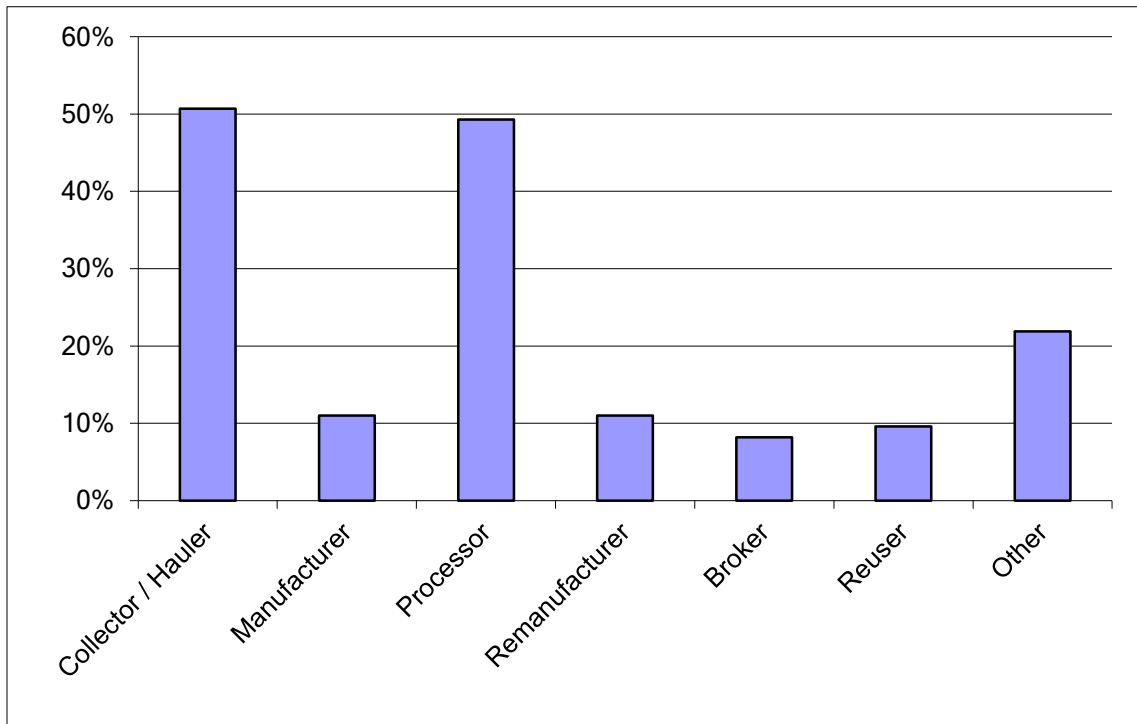
Over 67% of business activities are related to recycling (this is the average percentage for each site indicated in the second and third question from all the survey responses).



**Question #5: Which category best defines your role as a recycling entity (check all that apply) (Table 4-4 and Figure 4-9)**

The majority of survey respondents (over 50%) identified their entity as a Recycling Collector/Hauler, which was followed by Recycling Processor (49%). Those that identified their entity as an Other Recycling Entity (22%) described their roles in recycling as the following; landfill, business consultant, trade association, electronic waste collector, recycling drop off site, government agency, equipment dealer, and demanufacturing. Very few respondents identified their entity as a Manufacturer, Remanufacturer, Re-user, or Broker.

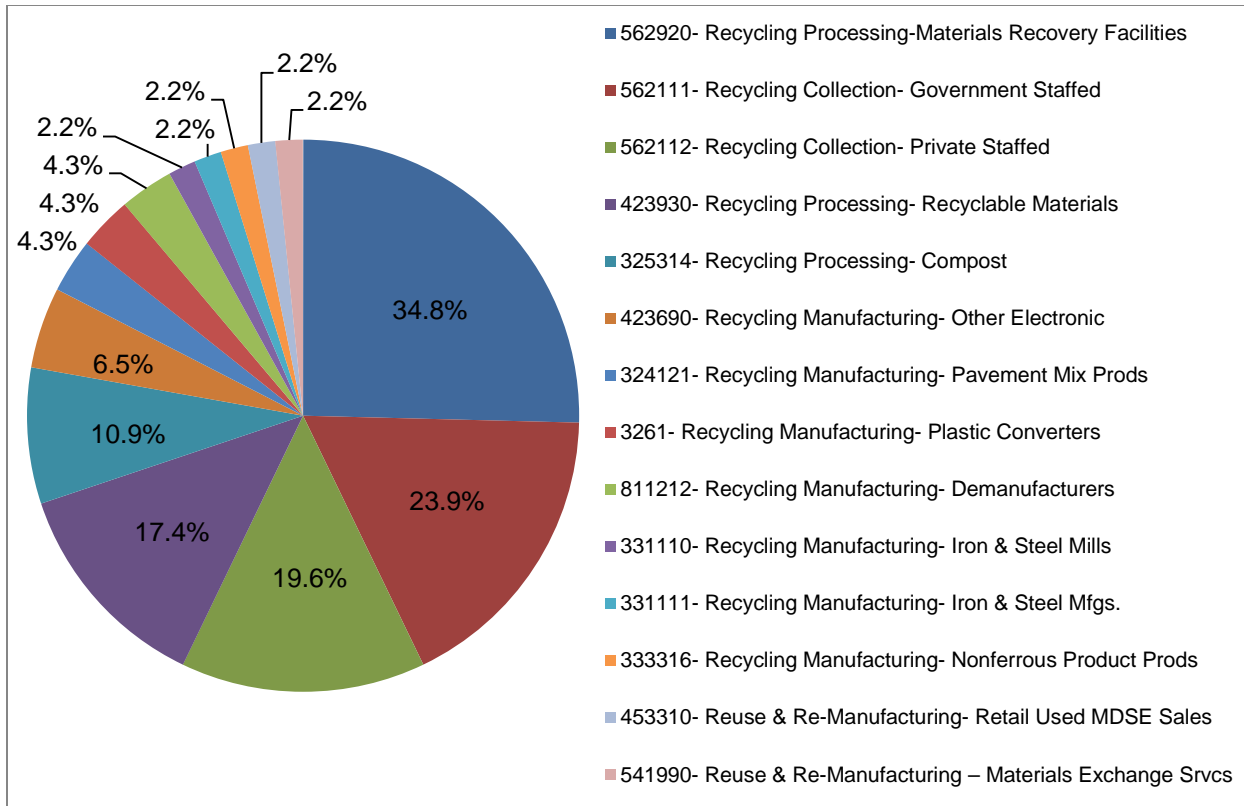
<b>Table 4-4: Which category best defines your role as a recycling entity (check all that apply)</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
Collector / Hauler	50.7%	37
Processor	49.3%	36
Other (please specify below)	21.9%	16
Manufacturer	11.0%	8
Remanufacturer	11.0%	8
Reuser	9.6%	7
Broker	8.2%	6
Other (please describe)		20
<b><i>answered question</i></b>		<b>73</b>
<b><i>skipped question</i></b>		<b>2</b>



**Figure 4-9: Percent of Respondents within Specific Recycling Entity Categories**

**Question #6: If you know under which NAICS code(s) your company / site operates, please include it (them) here (multiple answers ok) (Check all the apply) (Figure 4-10)**

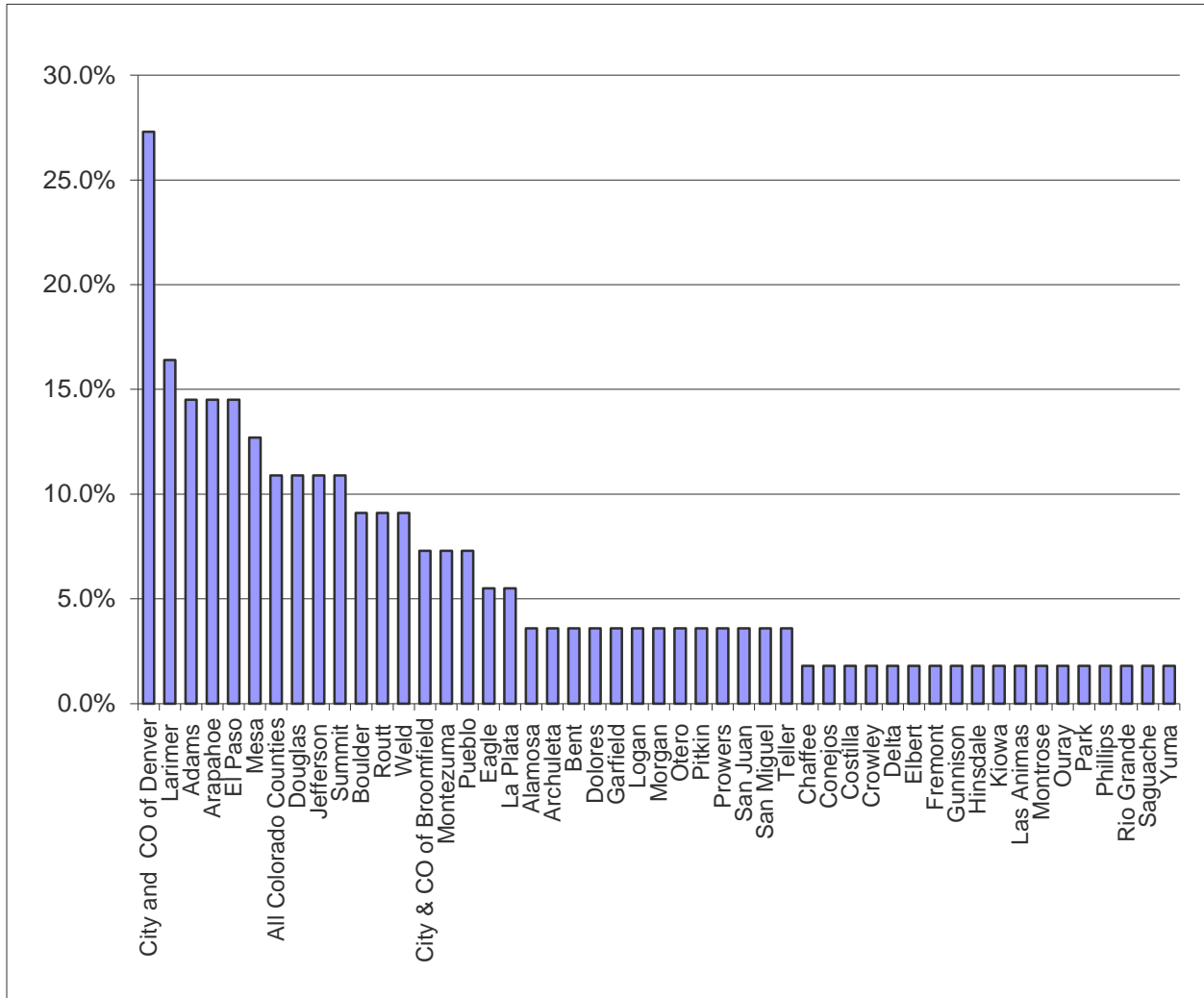
Over 34% of respondents identified their entity as NAICS Code 562920 - Recycling Processing-Materials Recovery Facilities, followed by NAICS Code 562111-Recycling Collection-Government Staffed-Solid Waste Collection (Over 23%), Recycling Collection-Private Staffed-Solid Waste Collection (Over 19%), and Recycling Processing-Recyclable Materials (Over 17%) Almost half of the respondents did not know what NAICS code their company/ site operated under.



**Figure 4-10: NAICS code(s) under which your company/site operate (share of all non-zero responses)**

**Question #7: What county(ies) do you operate in (mark as many as apply)? (Figure 4-11)**

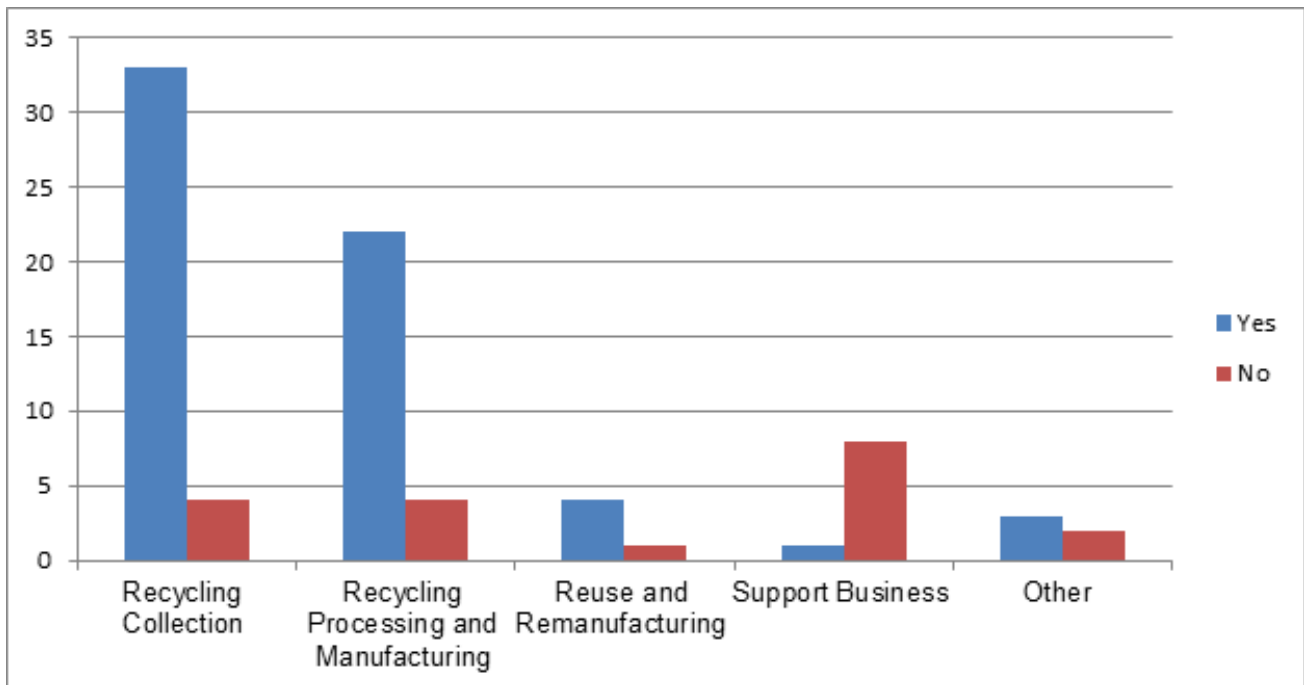
Over 22% of respondents operate in the City and County of Denver, followed by Jefferson County (16%), Larimer County (16%), El Paso County (14%), Adams County (13%), Arapahoe County (13%), Boulder County (11%), Mesa County (11%), Douglas County (10%), Summit County (10%), and Weld County (10%). Survey responses were received from entities operating in most of the counties.



**Figure 4-11: What county(ies) do you operate in (mark as many as apply)?**

**Question #8: Questions 9-13 help us better understand the sub sectors of recycling: Recycling Collection, Recycling Processing and Manufacturing, Reuse and Remanufacturing, Support Business, and Other. Please answer Yes or No to the recycling categories your business participates in. Note: It is possible for a firm to be engaged in more than one type of recycling. It is also possible for a firm to only dedicate a small percentage of its total time to recycling; therefore the answer may not add up to 100% unless the entire business is dedicated to recycling (for example, if a quarter of your business is dedicated to manufacturing of glass containers,” place “25” to the right of the “Glass container manufacturing” category below)(Figure 4-12).**

33 entities identified their entity as a Recycling Collection Site, followed by 22 Recycling Processing and Manufacturing Entities, 4 Reuse and Remanufacturing Entities, and 4 Support Businesses or Other Entities.

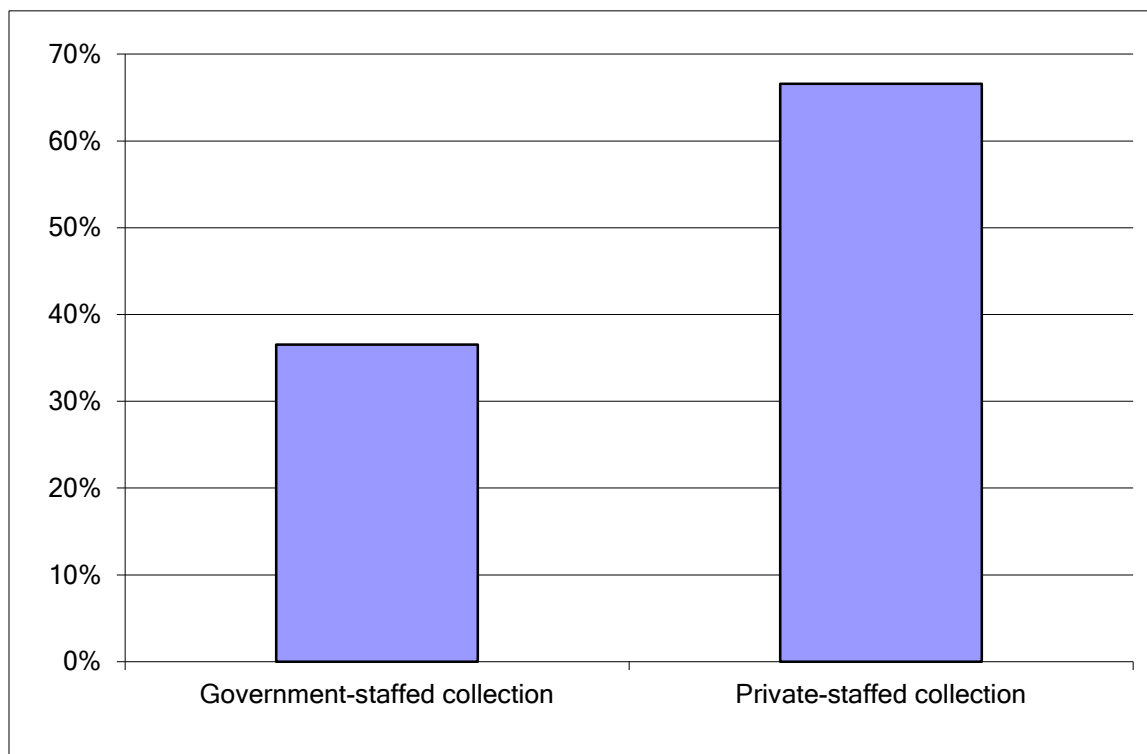


**Figure 4-12: Number of Businesses in Different Subsectors of Recycling**

**Question #9: Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING COLLECTION categories provided below by writing in the percentage to the right of the category. (Table 4-5 and Figure 4-13)**

Over 66% of entities identified as a Recycling Collection Facility were privately staffed, while only 37% were government staffed.

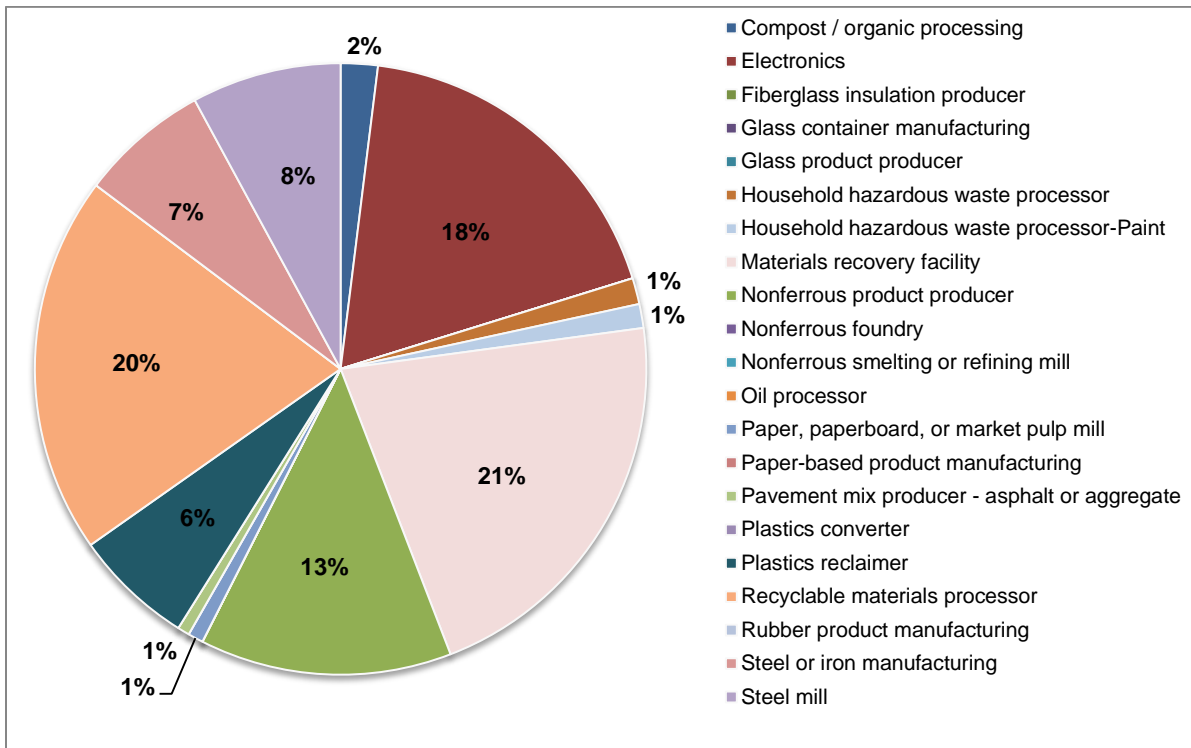
<b>Table 4- 5: Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING COLLECTION categories provided below by writing in the percentage to the right of the category</b>		
<b>Answer Options</b>	<b>Response Average</b>	<b>Response Count</b>
Government-staffed collection	36.54	26
Private-staffed collection	66.58	31
<b><i>answered question</i></b>		<b>42</b>
<b><i>skipped question</i></b>		<b>33</b>



**Figure 4-13: Average Percentage of Business devoted to the following Recycling Collection Categories**

**Question #10: Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category (Figure 4-14)**

Over 42% of responding entities identified themselves as a Recycling Processing and Manufacturing facility were a Materials Recovery Facility, followed by Recyclable Materials Processor (over 39%), and Electronics Recycling Processor (over 36%). It is also worth noting that 26% of entities operate as a Nonferrous Product Producer and 15% of entities operate as either a Steel or Iron Manufacturing Site or Steel Mill.



**Figure 4-14: Percentage of Business Devoted to the following Recycling Processing and Manufacturing Categories**

**Question #11: Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.**

Over 15% of respondents who identified their entity as a Reuse and Remanufacturing facility were a Computer / Electronic Appliance Remanufacturing Site. A few respondents indicated that their entity was one of the following: an equipment or toner cartridge manufacturing site, retail used merchandise sales, or wood reuse or pallet rebuilder.

**Question #12: Please indicate what percentage of your business practice (at this site) is applicable to the following SUPPORT BUSINESS categories provided below by writing in the percentage to the right of the category.**

Over 22% of respondents with entities identified as a Support Business were a recycling transporter and 15% of respondents identified their business as a brokerage entity. A few

respondents indicated that their entity was either a recycling and reuse equipment manufacturer or materials exchange entity.

***Question #13: Please indicate what percentage of your business practice (at this site) are applicable to the following OTHER categories provided below by writing in the percentage to the right of the category.***

Over 34% of respondents who identified their entity as an Other Recycling Business operate as a recycling processor / manufacturer. A few respondents also identified their entity as a reuse / remanufacturer.

***Question #14: Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.***

The average number of Full Time employees based on all survey responses is 58 FTE's. The number of Full Time employees ranges from 0 to 1400 FTE's.

***Question #15: Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.***

The average number of Part Time employees based on all survey responses is 14 PTE's. The number of Part Time employees ranges from 0 to 600 PTE's.

***Question #16: What was the average number of hours PART TIME employees worked per week in 2013?***

The average number of hours for Part Time employees based on all survey responses is 14 hours/week. The number of hours worked for Part Time employees ranges from 0 to 77 hours/week.

***Question #17: What was the total payroll associated at this site in 2013?***

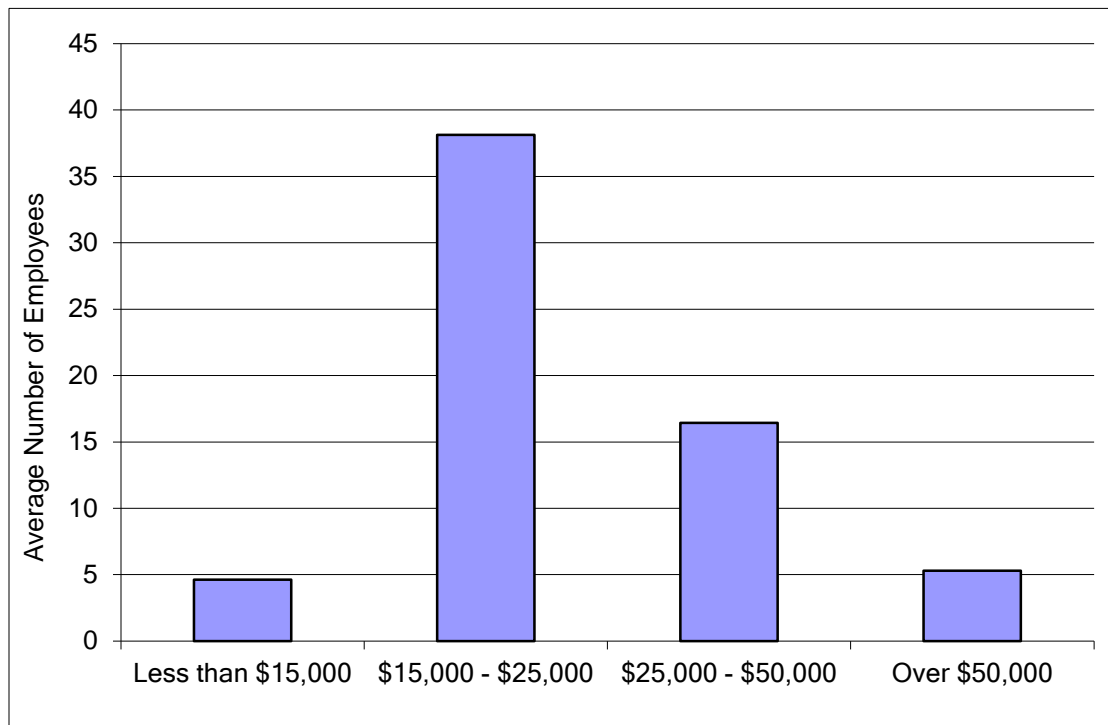
The average payroll associated at the sites indicated in the survey for 2013 based on all survey responses is \$1,196,334 dollars. Total payroll at the sites indicated in the survey ranges from \$0 to \$4,500,000.dollars.



**Question #18: Please indicate the number of employees within the following salary ranges: (Table 4-6 and Figure 4-15)**

The majority of respondents indicated that their employees earn salaries in the \$15,000 - \$25,000 or \$25,000 - \$50,000 range. Only a few respondents indicated that their employees fell in the other salary ranges.

<b>Table4- 6: Please indicate the number of employees within the following salary ranges</b>				
<b>Answer Options</b>	<b>Average Number of Employees</b>	<b>Response Range</b>	<b>Response Total</b>	<b>Response Count</b>
Less than \$15,000	4.62	0 - 40	120	26
\$15,000 - \$25,000	38.13	0 - 1086	1,182	31
\$25,000 - \$50,000	16.44	0 - 239	707	43
Over \$50,000	5.29	0 - 75	185	35
<b><i>answered question</i></b>				<b>54</b>
<b><i>skipped question</i></b>				<b>21</b>



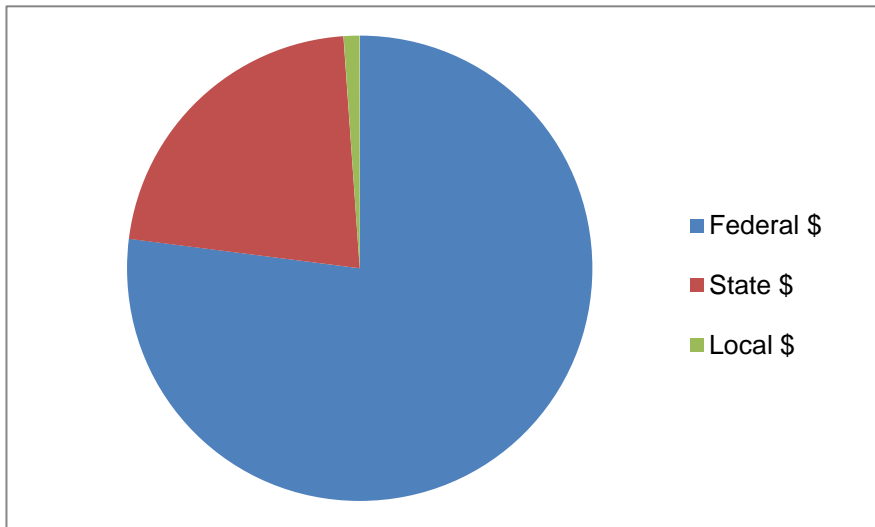
**Figure 4-15: Average Number of employees in certain salary ranges**

**Question #19: What was the total amount of revenue associated with recycling at this site in 2013?**

The average total revenue associated with recycling at the site indicated in the survey for all responses for the location is \$3,999,284 dollars and the average total recycling revenue is \$2,839,160 dollars.

**Question #20: Please indicate the TOTAL amount paid in taxes for each of the following categories in 2013. (Figure 4-16)**

The average total amount paid in taxes for all survey responses is as follows: Federal taxes - \$85,175 dollars, State taxes - \$24,179 dollars, and local taxes - \$1,232 dollars.

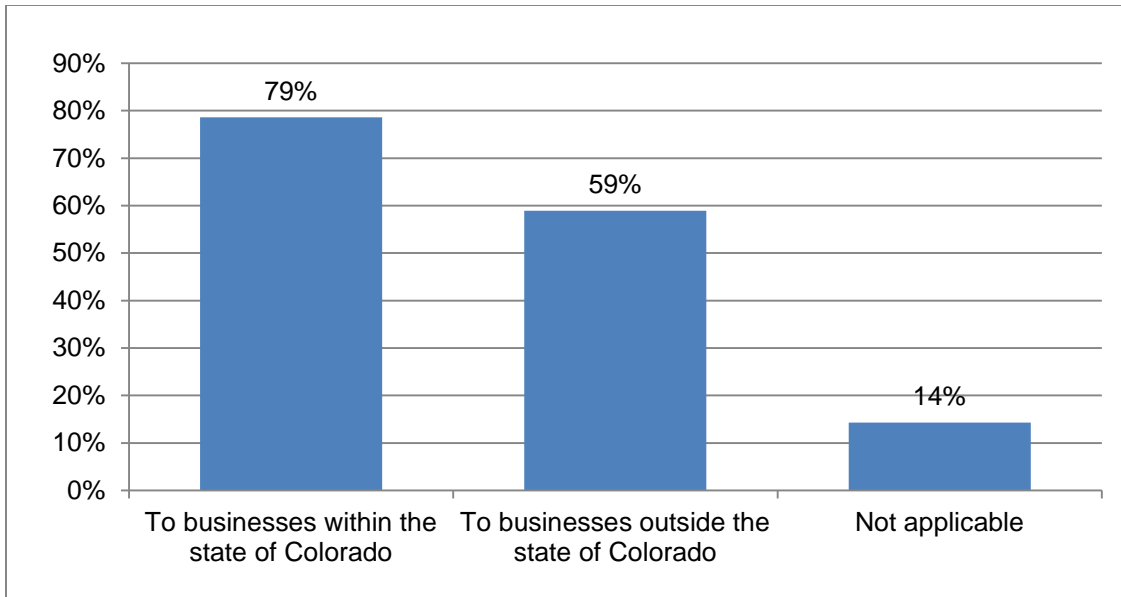


**Figure 4-16: Taxes Paid (Federal, State, and Local)**

**Question #21: Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box. (Table 4-7 and Figure 4-17)**

The majority of survey respondents (over 78%) indicated that they sell their recycling-related products to businesses within the State of Colorado. However, the majority of survey respondents also indicated that they sell their recycling related products to businesses outside the State. Only 14% indicated that neither applied. According to survey participants, compost, tires, concrete/ asphalt, contaminated soil, resale/reused or dismantled products, paper, and some scrap metal are some of the recyclable products that are sold locally. Businesses commented that it is cost prohibitive to sell some recyclable products (i.e. bailing twine, E-Waste, steel, metal commodities, plastics, etc.) within the state of Colorado because businesses are able to sell their products for a higher price elsewhere even with the shipping costs included. Colorado businesses sell recyclable products to most of the US states and internationally to quite a few countries (although Asia remains a top pick). Additionally, businesses use brokerage firm to sell and move products that can't be handled locally.

<b>Table 4-7: Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box</b>		
<b>Answer Options</b>	<b>Response Percent</b>	<b>Response Count</b>
To businesses within the state of Colorado	78.6%	44
To businesses outside the state of Colorado	58.9%	33
Not applicable	14.3%	8
Comment:		27
<b><i>answered question</i></b>		<b>56</b>
<b><i>skipped question</i></b>		<b>19</b>

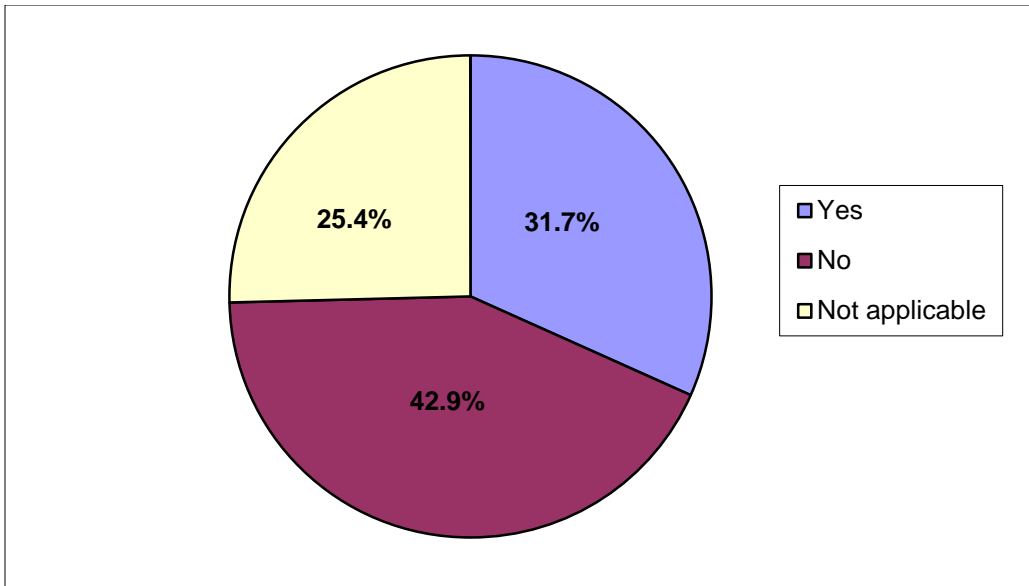


**Figure 4-17: Locations where recycling related products are sold (average percent of responses)**

**Question #22: Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs? (Table 4-8 and Figure 4-18)**

Almost 43% of survey respondents do not partner with local Colorado manufacturers to use recycled materials for their manufacturing needs. Only 32% of survey respondents indicated that they do partner with local manufacturers to use recycled materials.

Answer Options	Response Percent	Response Count
Yes	31.7%	20
No	42.9%	27
Not applicable	25.4%	16
<b><i>answered question</i></b>		<b>63</b>
<b><i>skipped question</i></b>		<b>12</b>

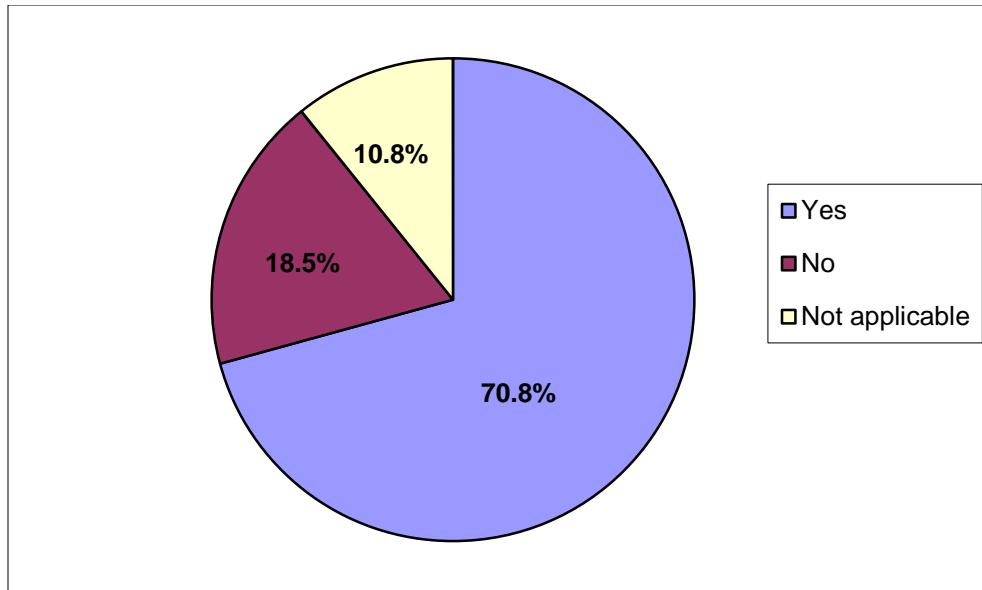


**Figure 4-18: Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?**

**Question #23: Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado? (Table 4-9 and Figure 4-19)**

The majority of survey respondents (71%) indicated that they have knowledge of, or believe that there is demand for, recycled materials in the State of Colorado. Only 19% of respondents did not have knowledge of, or believe there is a demand for, recycled materials in Colorado.

Answer Options	Response Percent	Response Count
Yes	70.8%	46
No	18.5%	12
Not applicable	10.8%	7
<b><i>answered question</i></b>		<b>65</b>
<b><i>skipped question</i></b>		<b>10</b>

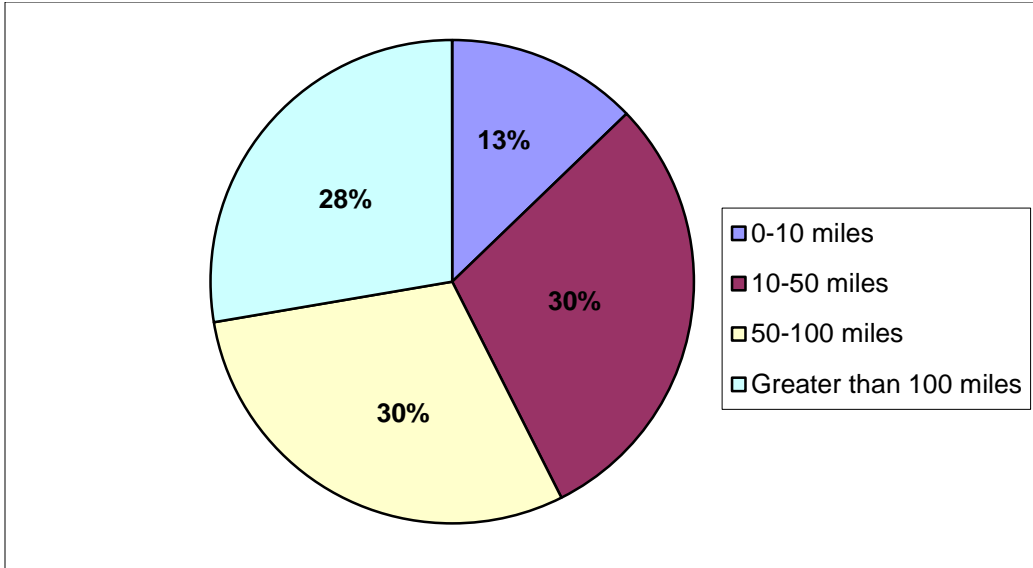


**Figure 4-19: Do you have knowledge of, or believe that there is demand for your recycled materials within the state of Colorado?**

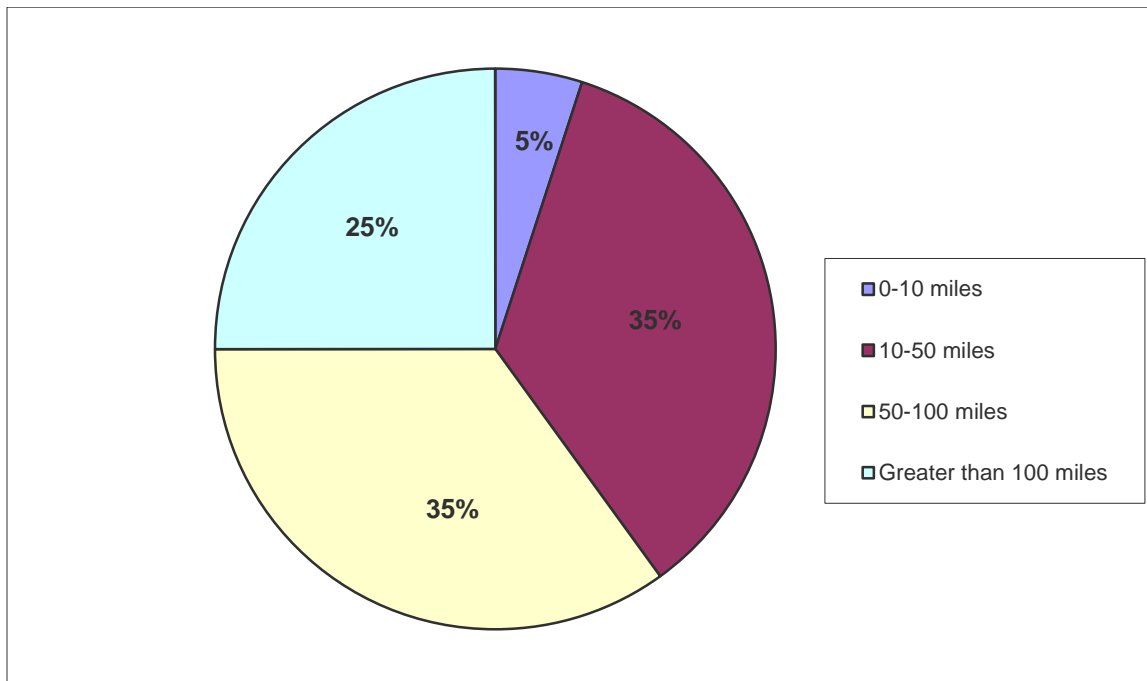
**Question #24: If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials: (Table 4-10 and Figure 4-20)**

28% of survey respondents collect their materials from over 100 miles away from their site, 30% travel between 10-50 miles from their site, and 30% travel between 50-100 miles. Only 13% of respondents travel less than 10 miles to collect their materials. For the Rural facilities, 25% of survey respondents collect their materials from over 100 miles away from their site, 35% travel between 10-50 miles from their site, and 35% travel between 50-100 miles. Only 5% of rural respondents travel less than 10 miles to collect their materials. Urban facility respondents indicated that 23% of survey respondents collect their materials from over 100 miles away from their site, 27% travel between 10-50 miles from their site, and 23% travel between 50-100 miles. Only 17% of respondents travel less than 10 miles to collect their materials.

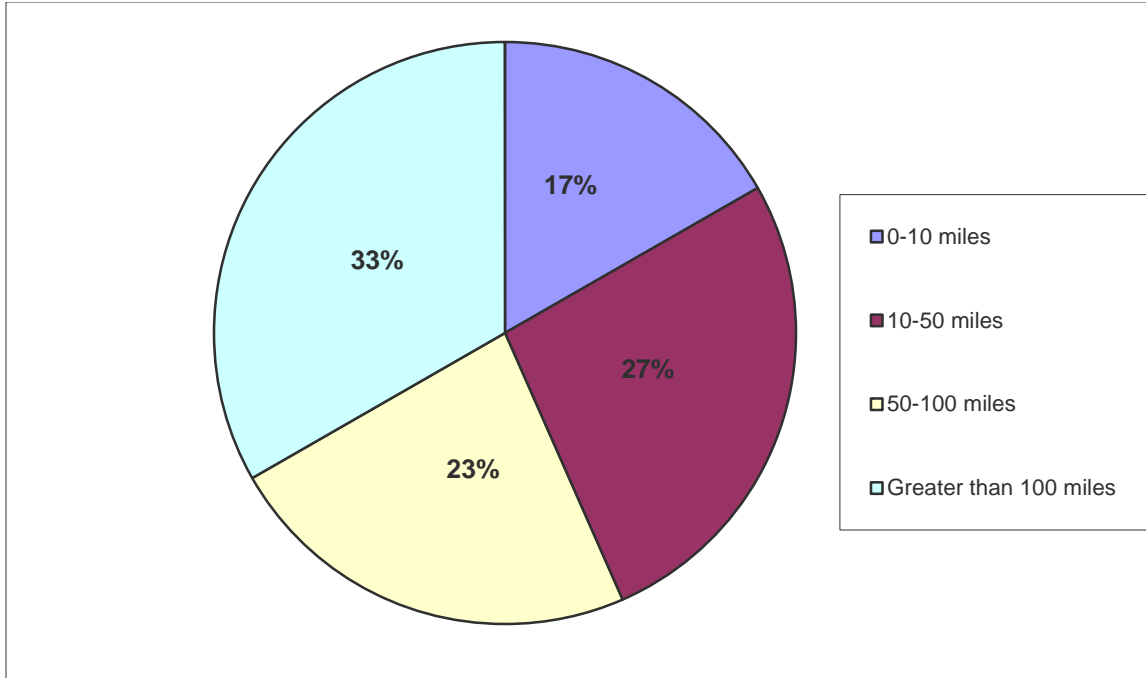
Answer Options	Response Percent	Response Count
0-10 miles	12.8%	6
10-50 miles	29.8%	14
50-100 miles	29.8%	14
Greater than 100 miles	27.7%	13
<b>answered question</b>		<b>47</b>
<b>skipped question</b>		<b>28</b>



**Figure 4-20a: If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials (Total).**



**Figure 4-20b: If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials (Rural).**



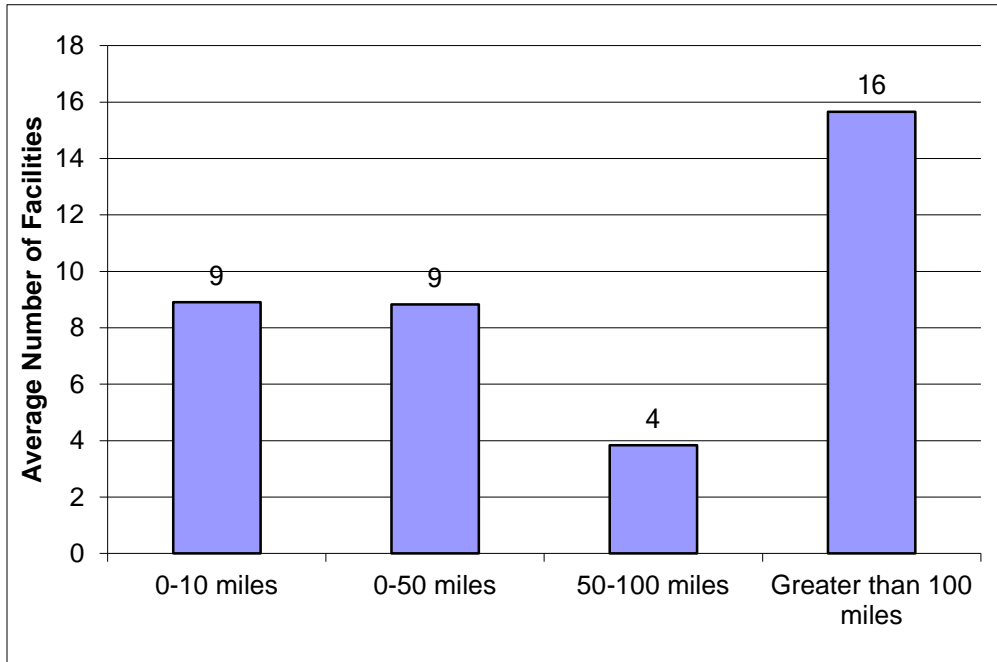
**Figure 4-20c: If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials (Urban).**

**Question 25: If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site: (Table 4-11 and Figure 4-21)**

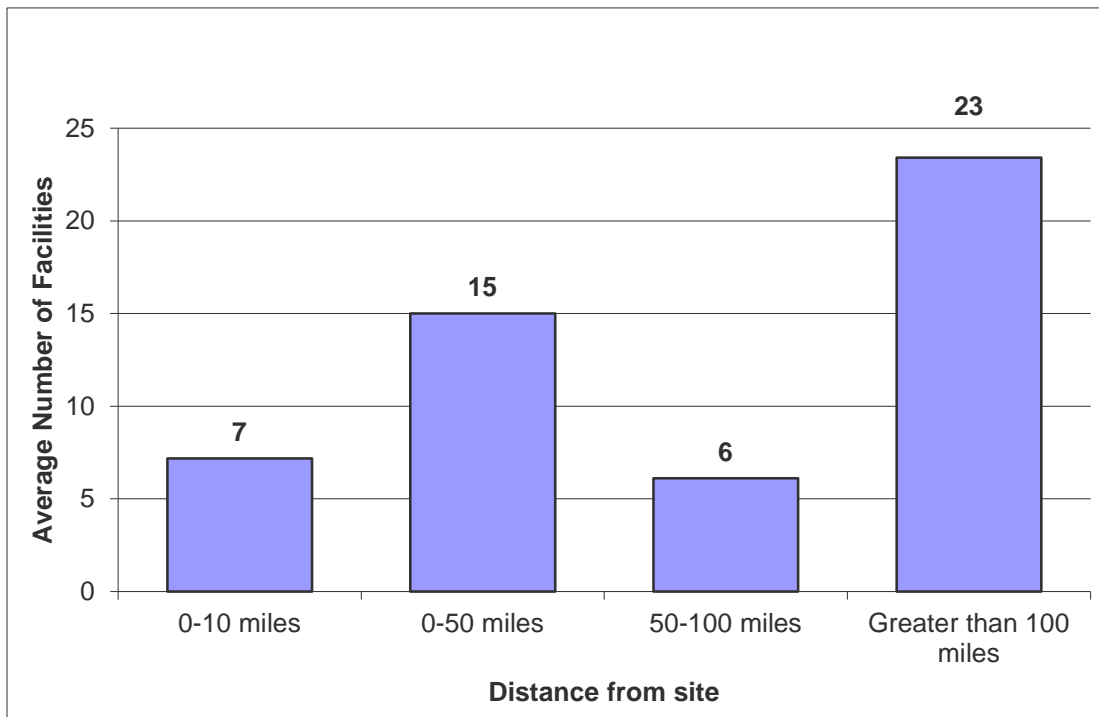
The majority of respondents move their materials for processing more than 100 miles from their site, with an average of 16 facilities (based on all survey response). This is followed by sites moving their materials between 0-50 miles from their site, with an average of 9 facilities (Table 4-11 and Figure 4-21a). Figures 4-21b and 4-21c present the number of rural and urban facilities, respectively, that move their materials for processing specific distances.

Answer Options	Average Number of Facilities	Response Count
0-10 miles	8.91	22
0-50 miles	8.83	18
50-100 miles	3.84	19
Greater than 100 miles	15.66	29
<b>answered question</b>		<b>23</b>
<b>skipped question</b>		<b>24</b>

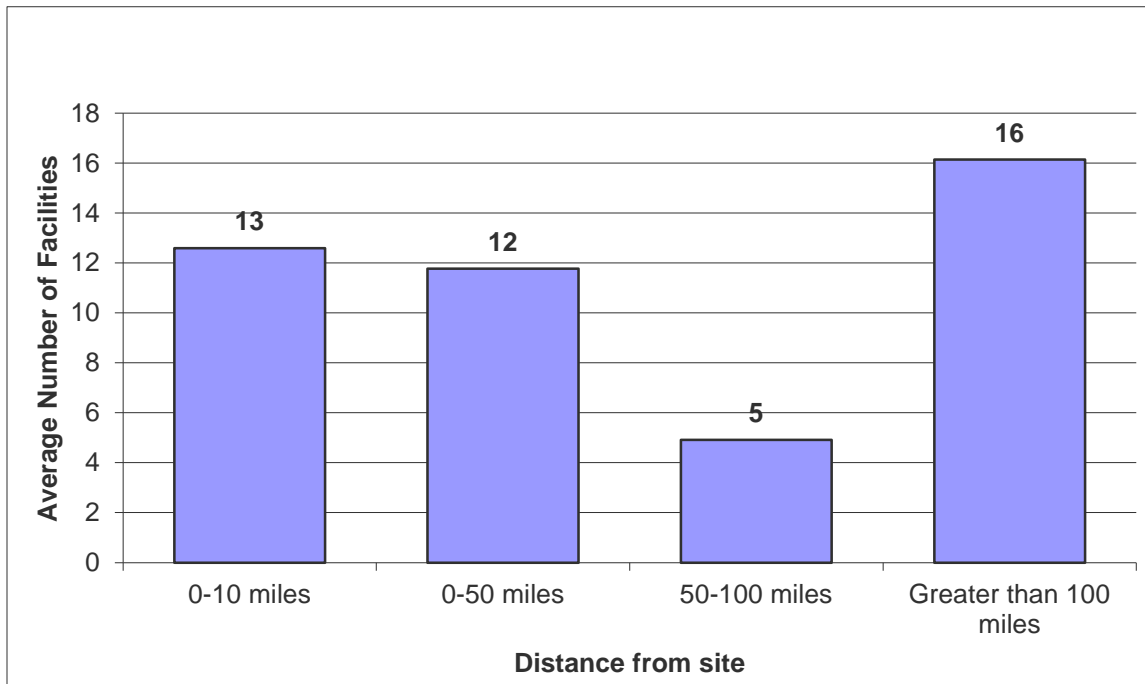




**Figure4- 21a: If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site (average number of facilities within each distance) – Total**



**Figure4- 21b: If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site (Rural facilities within each distance) - Rural**



**Figure4- 21c: If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site (Urban facilities within each distance) - Urban**

**Question #26: Please provide any additional information and/or comments here:**

The survey respondents provided several comments on the survey questions, clarification on what and how they recycle, and a few suggestions on how the CDPHE grant fund could be improved. Some of the common comments include recommendations that recycling grants should focus on Hub and Spoke program and reconsideration of how grant money is used to attract and support collectors and processors, especially since the State has limited resources. For some participants, the survey did not address the type of recycling they do (concrete and asphalt reuse for roads, consulting, academic studies, various E- waste collection services not covered under identified business categories, etc.). Further, quite a few local governments and local businesses would like to expand their recycling operations, but they need investments in time and money.

**4.4 Summary**

This chapter provides information on the need, methods, and results of contacting various RRR entities to collect data necessary for the economic impact analysis of the RRR industry in the State of Colorado. Significant data and interesting information was obtained through the online survey of RRR entities. This data and information is essential to the study and will be included as data input into the next phase of this study, the economic impact analysis.

**4.5 Lessons Learned**

The survey had the potential to realize wide participation throughout the state of Colorado. However, it had a lower response rate than preferred. From this, there were several lessons

learned that could be used to improve response rates of any future surveys completed for the RRR industry in Colorado or elsewhere. One lesson and opportunity in the future is that there was not a lot of lead-time to introduce and present the survey to potential respondents, limiting the understanding of the need, the purpose, or the value of the survey, and thus limiting the response rate. Further, it appears that the potential respondents felt a limited incentive to participate in the survey. Future opportunities should include specific incentives to participate in the survey, thus increasing the response rate. A longer period to keep the survey open, with greater opportunity to connect directly with each potential participant would also create greater opportunity for increasing the response rate.

## 5 Regional Impact Analysis

This chapter provides a detailed description of the methodologies used to develop the economic activity estimates. It includes general discussions of strategies for data gathering and analyses employed in the study. The specific methodology for obtaining the direct data for each category is presented along with the results of the study. The remainder of this chapter identifies and presents the economic impact analysis with the following layout:

- Section 5.1 identifies the data used and the data sources.
- Section 5.2 provides the details of the approach and methodology followed for the economic impact analysis.
- Section 5.3 identifies the results of the analysis.
- Section 5.4 summarizes the conclusions drawn from the analysis.

### 5.1 Data Development and Sources

The methodology to be used to identify economic impacts of waste diversion on the State of Colorado requires significant and specific data to be collected from available sources. The Data Gap Analysis was the first step in the process, with the Survey Plan and the Data Collection Report providing additional necessary information.

The impact analysis focused on using existing data, of sufficient quality, consistent with the study, for as many business categories as possible. A survey of RRR firms was conducted, and is discussed in Chapter 4. If little or no existing information was available, estimates were derived based on the limited existing data and estimations.

For the economic impact analysis IMPLAN data is the primary source of economic activity. IMPLAN data comes from various sources. Employment and wage and salary income at the state and county levels is from the Bureau of Labor Statistics (BLS). National, state and county level proprietors, proprietor income, and the relationship between employee compensation and wage and salary income (to infer benefits) are from the Bureau of Economic Analysis (BEA). Data from the U.S. Census Bureau includes the number of firms by size at the national, state, county and zip-code levels.

The survey provided data and other information that ENVIRON used to help enhance the IMPLAN data. Specifically, the survey results provided the percentages of the business activities within a sector attributable to recycling for specific NAICS codes where sufficient responses were provided. These percentages were applied to the specific NAICS codes within the IMPLAN model. All NAICS codes included in the RRR industry used this study are provided in Tables 2-2 and 3-1. However, not all NAICS codes were represented in the survey. So the

percentages from the Missouri Recycling Economic Information Study MOREIS Final Report (Missouri Study) were used where they were missing in the Colorado survey.<sup>5</sup>

Further, the survey also provided additional information regarding the RRR industry in Colorado that can be used outside the IMPLAN analysis, as supplemental data and information, as presented in Chapter 4. All data collected was incorporated into an Excel spreadsheet for analysis.

NAICS codes can provide very specific business groupings for analysis. However IMPLAN groups the NAICS codes into larger, more general, IMPLAN industry sectors. Each IMPLAN industry sector includes at least one NAICS code. Table 5.1 provides a cross-reference for converting NAICS codes to the IMPLAN sectors. In many cases, the listed codes also include businesses and other NAICS codes not involved in RRR. In those cases an adjustment factor has been applied. The adjustment factor is comprised of two parts: the share of the IMPLAN code that includes NAICS codes related to the RRR industry based on US Census Bureau County Business Patterns, and the share of the included individual NAICS codes that are related to the RRR industry, based on data received from the Colorado survey when available, and the Missouri Study.

<b>IMPLAN Sector</b>	<b>NAICS Codes</b>
100	32192, 321920
112	322299
116	324121
130	325314
141	325991
144	326122
147	326150
149	326191, 326199
151	326220
152	326291, 326299
154	327213
170	331110, 331111
174	331315, 331316
177	331421, 331423

<sup>5</sup> Valentine, David and Ann Ulmer, Institute of Public Policy Truman School of Public Policy, 2005, Missouri Recycling Economic Information Study MOREIS Final Report. Prepared for Environmental Improvement and Energy Resources Authority (EIARA).

<b>IMPLAN Sector</b>	<b>NAICS Codes</b>
178	331492
180	331521, 331522, 331523, 331524, 331525
319	42193, 423140, 423680, 423840, 423930
330	45331, 453310
380	54199, 541990
390	562111, 562112, 562920
416	811212

## **5.2 Analytical Approach and Impact Methodology**

Changes in output and employment often occur locally as a result of business changes, and such changes have implications for other parts of the local economy. This study uses an input-output (I/O) methodology to determine the economic and fiscal impacts of the project on the economy of the state within Urban and Rural regions. A regional input-output model traces the flow of interactions between local industries, with industries outside the region, and with final demand sectors in order to determine economic and fiscal impacts of the project. These models employ data on the intermediate and final goods produced. Information on the inputs for all industries is required in order to produce the dollar value of output for a specified industry.

Total economic values were estimated through economic modeling with IMPLAN. In order to apply the economic model accurately, certain categories required additional information as intermediate inputs. These were obtained through the survey.

An input-output model is a technique that quantifies the interactions between industries within an economy. Input-output models yield multipliers that are used to calculate the total direct, indirect, and induced impact on jobs, income and output resulting from a dollar of spending on goods and services in the study area. The model used to estimate economic impacts for this study is IMPLAN which is an input-output model developed by the United States (US) Government and the University of Minnesota (available from the Minnesota IMPLAN Group, Inc.[MIG]).

IMPLAN was chosen because it requires regional data which has been compiled from multiple sources and includes hundreds of industrial sectors. In addition to being widely used in regional economic analysis, the model and its methodology has been extensively reviewed in professional and economic journals. IMPLAN was developed by the US Forest Service in cooperation with the Federal Emergency Management Agency and the Bureau of Land Management (BLM) for the purpose of land and resource management planning. For the specified region, the IMPLAN approach accounts for all of the dollar flows between the different sectors within the economy and emulates the way income injected into one sector is then spent and re-spent in other sectors of the economy, generating economic multipliers.

ENVIRON collected 2012 Colorado county data from IMPLAN. IMPLAN measures economic impacts from data representing actual local economies. IMPLAN estimates regional contribution to jobs, income, revenue, GDP and taxes by following inter-industry spending from the original purchase through the full supply chain. IMPLAN reports economic contributions at three levels: (1) direct effects, (2) indirect effects, and (3) induced effects. The original purchase is known as the “direct” effect. “Indirect” effects are stimulated by the “direct” effect. Each supplier of an industry purchases inputs from other suppliers in order to create their own products. Increases in production not only require an increase in purchases of supplies, but typically also require an increase in total income paid to labor. The economic effects resulting from spending of labor income are known as “induced” effects. The sum total of direct, indirect, and induced effects is the total economic contribution of RRR expenditures.

IMPLAN is a tool to assess regional economic impacts. For this study, the Department was interested in pursuing an economic impact analysis for both an urban Colorado region and a rural Colorado region, as economies often widely differ between these two types of regions. The economic impacts from the RRR industry were analyzed separately for rural and urban areas within Colorado. For this analysis counties were designated either “rural” or “urban” based on information and a map obtained from Colorado Rural Health Center<sup>6</sup> and then consolidated for the regional economic modeling. Those counties designated “frontier” were included in the rural analysis. Table 5-2 shows the county designations for this study.

<b>Table 5-2: Urban and Rural Counties of Colorado</b>		
<b>Rural Counties</b>	<b>Rural Counties (cont.)</b>	<b>Urban Counties</b>
Moffat	Mineral	Larimer
Routt	Rio Grande	Weld
Jackson	Alamosa	Boulder
Rio Blanco	Archuleta	Broomfield
Grand	Conejos	Gilpin
Garfield	Costilla	Clear Creek
Eagle	Huerfano	Denver
Summit	Las Animas	Adams
Pitkin	Logan	Arapahoe
Lake	Sedgwick	Jefferson
Delta	Phillips	Douglas
Gunnison	Morgan	Elbert
Chaffee	Washington	Park

<sup>6</sup> Colorado Rural Health Center, 2014, Colorado: County Designations, 2014, available at: <http://coruralhealth.org/wp-content/uploads/2013/10/2014.Colorado-County-Designations.pdf>.

<b>Rural Counties</b>	<b>Rural Counties (cont.)</b>	<b>Urban Counties</b>
Freemont	Yuma	Teller
Montrose	Lincoln	El Paso
Ouray	Kit Carson	Pueblo
San Miguel	Cheyenne	Mesa
Hinsdale	Kiowa	
Saguache	Crowley	
Custer	Otero	
Dolores	Bent	
San Juan	Prowers	
Montezuma	Baca	
La Plata		

As presented above, impacts resulting from operations of the various businesses within the RRR sector are composed of direct, indirect, and induced impacts. These impacts represent different yet related responses to the operation of these businesses. The sum of the three different impacts represents the total impact due to the RRR industry within urban and rural counties within the state of Colorado.

- Direct impacts indicate the initial change in economic activity due to operation of the RRR industry. Direct impacts capture both RRR activities and activities in other industries that directly support the RRR industry. Direct impacts measure the total amount of economic activity in terms of the value and employment that is injected into the local economy directly from the sector. Both the Rural and Urban analyses identify and assess the impacts of the RRR industry to the Colorado regional economy.
- Indirect impacts measure the response of local industries to increased demand from inter-industry transactions. The indirect impacts trace the ripple effect through the local economy as local industries increase supply due to the increase in demand generated from the RRR operation demand.
- Induced impacts measure the response of local industries to the increased expenditures resulting from new household income generated from direct and indirect effects.



The IMPLAN model along with the associated database and data provided by the Colorado Recycling Industry Survey, were used to determine the inter-industry transactions in the counties required for calculating the impact of the RRR industry in Colorado. Two IMPLAN models were utilized: one including all urban counties and one including all rural counties within the state. The share of each IMPLAN sector related to the RRR industry is based on a combined set of percent shares. The first is the percent share of business activities related to the recycling industry for each of the NAICS codes in the study. As mentioned above, these were based on the survey results and the results of the Missouri Study. The second set of percentages used is that share of each of the IMPLAN sectors that is represented by the study NAICS codes, based on total number of employees. These percentages and the resulting percentage applied to each sector are presented in Table 5.3. Using the percentages shown in Table 5.3, Table 5-4 presents the Urban, Rural, and State economic activity for each of the sectors.

<b>Table 5-3: Recycling Industry Percentages</b>			
<b>IMPLAN Sector</b>	<b>NAICS Code %</b>	<b>IMPLAN Sector %</b>	<b>Recycling % of IMPLAN sector (applied to each sector)</b>
100	100%	100%	100%
112	100%	100%	100%
116	100%	100%	100%
130	13%	100%	13%
141	100%	100%	100%
144	100%	100%	100%
147	100%	100%	100%
149	100%	100%	100%
151	100%	100%	100%
152	100%	100%	100%
154	90%	67%	60%
170	95%	100%	95%
174	48%	100%	48%
177	95%	1%	1%
178	95%	50%	48%
180	90%	100%	90%
319	97%	10%	10%
330	100%	100%	100%

<b>IMPLAN Sector</b>	<b>NAICS Code %</b>	<b>IMPLAN Sector %</b>	<b>Recycling % of IMPLAN sector (applied to each sector)</b>
380	100%	45%	45%
390	67%	44%	29%
416	100%	31%	31%

<b>IMPLAN Sector</b>	<b>Rural Direct Output</b>	<b>Urban Direct Output</b>	<b>State Direct Output</b>
100	\$3,054,057	\$72,587,303	\$75,641,360
112	\$1,687,682	\$10,376,748	\$12,064,430
116	\$4,366,093	\$140,691,315	\$145,057,407
130	\$767,582	\$4,988,225	\$5,755,807
141	\$10,955,637	\$488,663,116	\$499,618,753
144	\$-	\$191,736,343	\$191,736,343
147	\$1,083,258	\$114,917,938	\$116,001,196
149	\$37,963,181	\$665,085,999	\$703,049,179
151	\$-	\$10,540,689	\$10,540,689
152	\$-	\$93,450,790	\$93,450,790
154	\$-	\$35,550,953	\$35,550,953
170	\$45,411,806	\$1,521,850,210	\$1,567,262,016
174	\$-	\$89,700,637	\$89,700,637
177	\$-	\$299,007	\$299,007
178	\$-	\$15,704,218	\$15,704,218
180	\$1,636,158	\$46,805,986	\$48,442,144
319	\$153,883,055	\$2,041,570,688	\$2,195,453,742
330	\$202,089,432	\$1,191,993,652	\$1,394,083,084
380	\$44,229,247	\$920,740,320	\$964,969,567
390	\$56,923,049	\$326,773,312	\$383,696,361
416	\$7,819,937	\$136,604,068	\$144,424,005
<b>Total</b>	<b>\$571,870,174</b>	<b>\$8,120,631,518</b>	<b>\$8,692,501,693</b>

### 5.3 Results

Upon completion of the IMPLAN study results, they were reviewed to ensure that direct, indirect, and induced study data were valid and meaningful. The methods of review included:

- Review of completed model analysis by senior staff; and
- Comparisons of per-employee figures and associated sectors to ensure reasonableness.

The results of this impact analysis are presented here as they relate to employment, labor income, output or demand, and tax revenue, for both urban and rural counties of Colorado State.

#### 5.3.1 Employment Impacts

The RRR industry generates jobs through the direct hiring of staff and indirect and induced impacts on jobs as local industries experience increases in demand for goods and services. The impact on jobs is measured by the total employment in the local economy resulting from the RRR industry. Total impact on jobs is the sum of the direct, indirect, and induced impacts, which are presented in Table 5-5.

<b>Impact</b>	<b>Annual Jobs from RRR - Urban</b>	<b>Annual Jobs from RRR - Rural</b>	<b>Annual Jobs from RRR - State</b>
Direct	39,791	3,774	43,565
Indirect	16,241	743	16,985
Induced	25,174	915	26,089
<b>Total</b>	<b>80,394</b>	<b>5,433</b>	<b>85,827</b>

Total employment is 85,827, the majority of which occurs in the urban areas (80,394). Total direct employment in the RRR industry is 43,565, with another 16,985 indirect and 26,089 induced jobs (totaling 43,074) added in Colorado. This indicates that each job added in the RRR industry, produces almost one more job. Food services and drinking places, the largest employment sector in Colorado, employs over 219,000, and real estate establishments employs over 168,000. By comparison, a 2005 recycling impact study of South Carolina<sup>7</sup> showed 37,440 recycling jobs, and a 2009 study of several northeast states<sup>8</sup> showed 2007 recycling employment impacts of over 52,000 for Pennsylvania.

<sup>7</sup> Hefner, Frank and Calvin Blackwell, 2006, The Economic Impact of the Recycling Industry in South Carolina, June 23.

<sup>8</sup> DSM Environmental Services, Inc. and MidAtlantic Solid Waste Consultants, 2009, Recycling Economic Information Study Update: Delaware, Maine, Massachusetts, New York, and Pennsylvania. Final Report, February,

### 5.3.2 Labor Income Impacts

The impact on employment (over 85,000 jobs) will generate impacts to local labor income. Labor income impacts are measured by the changes in wages to labor associated with the employment impacts of the RRR industry. Total labor income impact is the sum of the direct, indirect, and induced impacts and is shown in Table 5-6.

<b>Impact</b>	<b>Annual Labor Income from RRR-Urban</b>	<b>Annual Labor Income from RRR-Rural</b>	<b>Annual Labor Income from RRR-State</b>
Direct	\$3,248	\$194	\$3,443
Indirect	\$1,056	\$34	\$1,090
Induced	\$1,218	\$34	\$1,252
<b>Total</b>	<b>\$5,522</b>	<b>\$263</b>	<b>\$5,785</b>

Total labor income is \$5,785 million, with the greatest amount occurring in urban areas (\$5,522 million). Direct annual labor income in the RRR industry is \$3,443 million. Another \$2,342 million in labor income is generated in indirect and induced impacts. For each dollar of direct labor income, another \$0.68 of labor income is generated throughout the Colorado economy. This indicates that the jobs generated within the RRR industry are generally higher wage jobs than those generated from the indirect and induced effects. This is especially true in the rural areas, where the labor income from the RRR industry only generates another \$0.35 induced and indirect labor income. The recycling industry, which comprises several sectors, can be compared to the total wholesale trade businesses, with labor income of more than \$9 billion. Comparing these results to other states, the personal income from the recycling study in South Carolina in 2005 was \$1.5 billion, and 2007 total payroll for Pennsylvania was \$2.2 billion.

### 5.3.3 Total Output / Demand Impact

Total output (or demand) impacts are the sum of the direct, indirect, and induced impacts. The direct impacts are the result of the output within the RRR-related IMPLAN sectors, with the indirect and induced impacts resulting from the flow through the rest of the economy of that output. Table 5-7a presents the total output impacts, broken down between direct, indirect and induced impacts.

**Table 5-7: Output / Demand Impacts of RRR Industry (millions of dollars)**

<b>Impact</b>	<b>Annual Output from RRR - Urban</b>	<b>Annual Output from RRR - Rural</b>	<b>Annual Output from RRR - State</b>
Direct	\$8,121	\$572	\$8,693
Indirect	\$2,436	\$97	\$2,533
Induced	\$3,329	\$103	\$3,432
<b>Total</b>	<b>\$13,886</b>	<b>\$772</b>	<b>\$14,658</b>

Total output is \$14,658 million, with the greatest share occurring in urban areas (\$13,886 million). The direct output from the RRR industry of \$8,693 million generates another \$5,9650 in indirect and induced effects. This indicates that for every dollar of output from the RRR industry, another \$0.69 is generated throughout the rest of the Colorado economy. The induced and indirect impacts are greater in the urban areas than in rural areas, generating \$0.71 and \$0.35 respectively from one dollar of RRR activity. These differences between regions are mostly likely due to different types of industries, and associated types of jobs, the RRR industry has an impact on. The output from the recycling industry can be compared to that of real estate establishments, of greater than \$25 billion. Total recycling economic impact for South Carolina in 2005 was \$6.5 billion, and \$20.6 for Pennsylvania in 2007.

Tables 5-7b and 5-7c provide the estimated breakdown of indirect and induced impacts, respectively for each of the IMPLAN sectors for both rural and urban counties. Total indirect impact of the RRRR Industry is \$2.6 billion, the majority of which occurs in urban counties. Total induced impact of the RRR industry is \$3.4 billion, with \$3.3 billion occurring in urban counties. The direct impacts are provided in Table 5-4.

<b>Table5-7b: RRR Industry Estimated Indirect Impacts by IMPLAN Sector (millions of dollars)</b>			
<b>IMPLAN Sector</b>	<b>Rural Indirect Output</b>	<b>Urban Indirect Output</b>	<b>State Indirect Output</b>
100	\$1	\$22	\$22
112	\$0	\$3	\$3
116	\$1	\$42	\$43
130	\$0	\$1	\$2
141	\$2	\$147	\$148
144	\$0	\$58	\$58
147	\$0	\$34	\$35
149	\$6	\$200	\$206
151	\$0	\$3	\$3
152	\$0	\$28	\$28
154	\$0	\$11	\$11
170	\$8	\$457	\$464
174	\$0	\$27	\$27
177	\$0	\$0	\$0
178	\$0	\$5	\$5
180	\$0	\$14	\$14
319	\$26	\$612	\$639
330	\$34	\$358	\$392
380	\$8	\$276	\$284
390	\$10	\$98	\$108
416	\$1	\$41	\$42
<b>Total</b>	<b>\$97</b>	<b>\$2,436</b>	<b>\$2,533</b>

<b>Table5-7c: RRR Industry Estimated Induced Impacts by IMPLAN Sector (millions of dollars)</b>			
<b>IMPLAN Sector</b>	<b>Rural Induced Output</b>	<b>Urban Induced Output</b>	<b>State Induced Output</b>
100	\$1	\$30	\$30
112	\$0	\$4	\$5
116	\$1	\$58	\$58
130	\$0	\$2	\$2
141	\$2	\$200	\$202
144	\$0	\$79	\$79
147	\$0	\$47	\$47
149	\$7	\$273	\$280
151	\$0	\$4	\$4
152	\$0	\$38	\$38
154	\$0	\$15	\$15
170	\$8	\$624	\$632
174	\$0	\$37	\$37
177	\$0	\$0	\$0
178	\$0	\$6	\$6
180	\$0	\$19	\$19
319	\$28	\$837	\$865
330	\$36	\$489	\$525
380	\$8	\$378	\$385
390	\$10	\$134	\$144
416	\$1	\$56	\$57
<b>Total</b>	<b>\$103</b>	<b>\$3,329</b>	<b>\$3,432</b>

### 5.3.4 Tax Revenue Impact

The RRR industry provides an opportunity for the local community to benefit from additional tax revenue that can be used to develop and improve local programs and interests. Taxes are levied directly on the operation of the RRR industry. However, as the additional income generated from the industry circulates in the economy, other revenue will be collected as well. This additional tax revenue will come from multiple sources including property taxes and consumption taxes. The sum of the different sources of tax revenue is the total state and local tax revenue estimated from the construction and operation of the re-refinery. This is presented in Table 5-8.

**Table 5-8: Annual State and Local Tax Impact of RRR Industry (millions of 2012 dollars)**

<b>Impact</b>	<b>Annual Tax Revenue from RRR - Urban</b>	<b>Annual Tax Revenue from RRR - Rural</b>	<b>Annual Tax Revenue from RRR – State</b>
Dividends	\$0.98	\$0.06	\$1.04
Social Ins Tax- Employee Contribution	\$2.11	\$0.16	\$2.27
Social Ins Tax- Employer Contribution	\$4.16	\$0.31	\$4.47
Corporate Profits Tax	\$10.57	\$0.64	\$11.21
Indirect Bus Tax: Sales Tax	\$521.10	\$38.02	\$559.12
Indirect Bus Tax: Property Tax	\$489.06	\$35.68	\$524.74
Indirect Bus Tax: Motor Vehicle License	\$14.17	\$1.03	\$15.21
Indirect Bus Tax: Severance Tax	\$13.20	\$0.96	\$14.16
Indirect Bus Tax: Other Taxes	\$35.18	\$2.57	\$37.75
Indirect Bus Tax: S/L Non Taxes	\$16.65	\$1.22	\$17.87
Personal Tax: Income Tax	\$96.33	\$3.99	\$100.32
Personal Tax: Non Taxes (Fines- Fees)	\$20.07	\$0.83	\$20.91
Personal Tax: Motor Vehicle License	\$6.40	\$0.27	\$6.67
Personal Tax: Property Taxes	\$2.06	\$0.09	\$2.15
Personal Tax: Other Tax (Fish/Hunt)	\$6.78	\$0.28	\$7.06
<b>Total State and Local Tax</b>	<b>\$1,239</b>	<b>\$86</b>	<b>\$1,325</b>

Local and state taxes generated from the RRR industry total \$1,325 million, with 93 percent of that resulting from RRR activity in the urban areas. The three largest contributors to state and local taxes include business sales tax, business property tax, and personal income tax.



### 5.3.5 Accuracy of Results

The results of this study for the categories identified are thought to be realistic and reasonable.

The study did encounter a few limitations that may have reduced the accuracy of the analysis results to the extent that our ability to accurately capture all recycling and reuse activity was constrained. The limitations of the study include:

- Not all NAICS codes related to RRR were represented in the survey, reducing the accuracy of the actual RRR activity in those NAICS codes.
- Several NAICS codes include businesses with no activities related to RRR and as such were likely not included in the survey. This was remedied by estimating the shares of the RRR business activity within the NAICS codes by applying the average percentage of RRR activity for the survey respondents.
- The IMPLAN sectors that include RRR activities also include several NAICS codes not related to RRR at all. This made it impossible to define a sector as specifically RRR. This was remedied through an approximation of RRR within the IMPLAN sector by applying the percentages of employment within NAICS codes with RRR activity.

Although the analysis is not able to portray all possible RRR activity, the estimations used create a reasonably accurate assessment for the categories included and constitutes a conservative estimate of the total amount of RRR activity taking place within the state of Colorado, specified as either Urban or Rural.

## 5.4 Conclusion

The RRR industry provides significant contributions to the regional economy through jobs, output, and income. The impact from RRR activities provides a strong stimulus to the state economy. The total annual economic output associated with the RRR sector is \$772 million in the rural region, and \$13.9 billion in the urban region.

The RRR industry impacts total employment by more than 5,000 employees in the rural region and over 80,000 employees in the urban region annually, totaling greater than 85,000 employees annually. Many of these jobs are in high paying industries that will support individuals in attaining and retaining self-sufficient employment, but others are in lower paying sectors such as retail and wholesale. Several of these lower wage jobs may benefit disadvantaged workers. This employment translates to over \$200 million in labor wages in the rural region, and greater than \$5,000 million in the urban region.

This economic activity provides an opportunity for additional tax revenue to be collected to support community benefits such as schools and parks. Annual state and local tax revenue is estimated at over \$80 million for the rural region and approximately \$1,200 million for the urban region.

## 6 Policy Recommendations

This section presents several policy recommendations for the RRR industry within the State of Colorado. The ENVIRON team would like to work with the Department to develop any further policy recommendations based on the results of this study.

1. The rural counties do not have as high a multiplier for RRR sectors as does the urban counties. This makes sense because the urban counties have most of the businesses. However, there is an opportunity to improve this effect for the rural areas if government policies that favor sectors favorably linked with RRR sectors are developed. For example, if a rural county has a strength in one RRR sector activity, but the input suppliers for that firm are located in urban counties, then there are additional transportation costs for each establishment. But if input providers for a recycling related sector are located nearby, then efficiencies grow, and the multipliers for these counties can improve.
2. If there is high unemployment in any county, public recycling facilities can be located in these areas and result in an economic stimulus.
3. To strengthen rural county RRR multipliers, the spatial location of strong RRR sector establishments should be analyzed to see if there are 'leakages' of indirect and induced impacts across state borders.
4. Existing government programs that support industries like manufacturing, can consider supporting and strengthening the added economic activity that comes from the RRR sector to maximize the benefit of government programs to support jobs and economic development.

## 7 References

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## **Appendix A**

### **Survey Questions**

**1. Please provide us the following information about you and your employer for our records and verification. All information will be kept confidential and no individual information will be provided to other parties. CDPHE will not request, or be entitled to see, any individual respondent data. All information will be processed, compiled, and consolidated prior to analysis and distribution, so as not to disclose any individual firm- or site-specific data. Results will only be used once aggregated to industrial sector. If there are multiple locations, please complete a separate survey for each site:**

Respondents Name/Title:

Company Name:

Address:

If Multiple locations, name of location:

City/Town:

State:

ZIP:

County of Location:

Contact Email Address:

Contact Phone Number:

**2. Is your firm or organization currently involved in the collection, sale, purchase, processing, or use of recycled material on a regular basis?**

- YES
- NO

**3. Does your firm or organization have multiple sites within Colorado where recycling activities occur? If yes, please be sure to complete a separate survey for each site (this includes all sites for which you are the primary responsible entity).**

- YES
- NO

**4. Approximately what percent of the business activities conducted at this site is related to the recycling industry? (If N/A enter zero)**

Percentage (whole number)

**5. Which category best defines your role as a recycling entity (check all that apply):**

- Collector / Hauler
- Manufacturer
- Processor
- Remanufacturer
- Broker
- Reuser
- Other (please specify below)

Other (please describe)

**6. If you know under which NAICS code(s) your company / site operates, please include it (them) here (multiple answers ok) (Check all the apply).**

- 562111- Recycling Collection- Government Staffed- Solid Waste Collection
- 562112- Recycling Collection- Private Staffed- Solid Waste Collection
- 325314- Recycling Processing- Compost & Organic Producers- Fertilizers
- 423930- Recycling Processing- Recyclable Materials Wholesalers-Recyclable Materials Wholesalers
- 562920- Recycling Processing-Materials Recovery Facilities-Materials Recovery Facilities
- 322299- Recycling Manufacturing-Paper & Paperboard Mills/Deinked Market- Other Converted Paper Product Manufacturing
- 324121- Recycling Manufacturing- Pavement Mix Producers- Asphalt paving mixtures and blocks
- 325991- Recycling Manufacturing- Plastic Reclaimers- Custom Compounding of Purchased Plastic Resins
- 3261- Recycling Manufacturing- Plastic Converters- Plastic Product Manufacturing
- 326211- Reuse & Re-Manufacturing- Tire Manufacturing (except retreading)
- 326220- Recycling Manufacturing- Rubber and Plastics Hoses and Belting Manufacturing
- 326291- Recycling Manufacturing- Rubber Product Manufacturing for Mechanical Use
- 326299- Recycling Manufacturing- All Other Rubber Product Manufacturing
- 327213-Recycling Manufacturing-Glass Containers Manufacturing Plants-Glass Containers
- 331110- Recycling Manufacturing- Iron and Steel Mills and Ferroalloy Manufacturing
- 331111- Recycling Manufacturing- Iron and Steel Manufacturers- Iron and Steel Mills
- 331315- Recycling Manufacturing- Nonferrous Product Producers- Aluminum sheet, plate, and foil manufacturing
- 333316- Recycling Manufacturing- Nonferrous Product Producers- Aluminum extruded product manufacturing
- 331318- Reuse & Re-Manufacturing- Other Aluminum Rolling, Drawing, and Extruding
- 331421-Recycling Manufacturing- Nonferrous Product Producers- Copper rolling, drawing, and extruding
- 331423- Recycling Manufacturers-Nonferrous Secondary Smelting & Refining-Miscellaneous Secondary Nonferrous Smelting, Refining and Alloying.
- 331492- Recycling Manufacturers-Nonferrous Secondary Smelting & Refining-Miscellaneous Secondary Nonferrous Smelting, Refining and Alloying. (except for copper and aluminum)
- 331521- Recycling Manufacturing-Nonferrous Foundries-Aluminum die-casting foundries
- 331522- Recycling Manufacturing-Nonferrous Foundries- Nonferrous (except aluminum) die-casting foundries
- 331523- Reuse & Re-Manufacturing- Nonferrous Metal Die-Casting, Foundries
- 331524- Recycling Manufacturing-Nonferrous Foundries- Aluminum foundries (except die-casting)
- 331525- Recycling Manufacturing-Nonferrous Foundries- Copper foundries (except die-casting)
- 423140- Recycling Manufacturing- Motor Vehicle Parts- Motor vehicle parts (used) merchant wholesalers
- 423690- Recycling Manufacturing- Other Electronic Parts and Equipment Merchant Wholesale
- 811212- Recycling Manufacturing- Demanufacturers- Computer and Office Machine Repair and Maintenance
- 321920- Reuse & Re-Manufacturing- Wood Reuse- Wood Container and Pallet Manufacturing
- 423840- Reuse & Re-Manufacturing- Other Reuse- Wholesale Machinery, Equipment, and Supplies
- 453310- Reuse & Re-Manufacturing- Retail Used Merchandise Sales- Used Merchandise Stores (excluding pawn shops)



541990- Reuse & Re-Manufacturing – Materials Exchange Services- All Other Professional, Scientific, and Technical Services

**7. What county(ies) do you operate in (mark as many as apply)?**

- All Colorado Counties
- Adams County
- Alamosa County
- Arapahoe County
- Archuleta County
- Baca County
- Bent County
- Boulder County
- City & County of Broomfield
- Chaffee County
- Cheyenne County
- Clear Creek County
- Conejos County
- Costilla County
- Crowley County
- Custer County
- Delta County
- City and County of Denver
- Dolores County
- Douglas County
- Eagle County
- Elbert County
- El Paso County
- Fremont County
- Garfield County
- Gilpin County
- Grand County
- Gunnison County
- Hinsdale County
- Huerfano County
- Jackson County
- Jefferson County
- Kiowa County
- Kit Carson County

- La Plata County
- Lake County
- Larimer County
- Las Animas County
- Lincoln County
- Logan County
- Mesa County
- Mineral County
- Moffat County
- Montezuma County
- Montrose County
- Morgan County
- Otero County
- Ouray County
- Park County
- Phillips County
- Pitkin County
- Prowers County
- Pueblo County
- Rio Blanco County
- Rio Grande County
- Routt County
- Saguache County
- San Juan County
- San Miguel County
- Sedgwick County
- Summit County
- Teller County
- Washington County
- Weld County
- Yuma County

**8. Questions 9-13 help us better understand the sub sectors of recycling: Recycling Collection, Recycling Processing and Manufacturing, Reuse and Remanufacturing, Support Business, and Other. Please answer Yes or No to the recycling categories your business participates in.**

**Note: It is possible for a firm to be engaged in more than one type of recycling. It is also possible for a firm to only dedicate a small percentage of its total time to recycling; therefore the answer may not add up to 100% unless the entire business is dedicated to recycling (for example, if a quarter of your business is dedicated to manufacturing of glass containers,” place “25” to the right of the “Glass container manufacturing” category below).**

	Recycling Collection (If Yes go to Question #9)	Recycling Processing and Manufacturing (If Yes go to Question #10)	Reuse and Remanufacturing (If Yes go to Question #11)	Support Business (If Yes go to Question #12)	Other (If Yes go to Question #13)
Yes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
No	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

**9. Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING COLLECTION categories provided below by writing in the percentage to the right of the category.**

Government-staffed collection	<input type="text"/>
Private-staffed collection	<input type="text"/>

**10. Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.**

Compost / organic processing	<input type="text"/>
Electronics	<input type="text"/>
Fiberglass insulation producer	<input type="text"/>
Glass container manufacturing	<input type="text"/>
Glass product producer	<input type="text"/>
Household hazardous waste processor	<input type="text"/>
Household hazardous waste processor-Paint	<input type="text"/>
Materials recovery facility	<input type="text"/>
Nonferrous product producer	<input type="text"/>
Nonferrous foundry	<input type="text"/>
Nonferrous smelting or refining mill	<input type="text"/>
Oil processor	<input type="text"/>
Paper, paperboard, or market pulp mill	<input type="text"/>
Paper-based product manufacturing	<input type="text"/>
Pavement mix producer - asphalt or aggregate	<input type="text"/>
Plastics converter	<input type="text"/>
Plastics reclaimer	<input type="text"/>
Recyclable materials processor	<input type="text"/>
Rubber product manufacturing	<input type="text"/>
Steel or iron manufacturing	<input type="text"/>
Steel mill	<input type="text"/>

**11. Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.**

Computer / electronic appliance remanufacturing	<input type="text"/>
Equipment or toner cartridge remanufacturer	<input type="text"/>
Motor vehicle part manufacturer	<input type="text"/>
Retail used merchandise sales	<input type="text"/>
Wood reuse or pallet rebuilder	<input type="text"/>

**12. Please indicate what percentage of your business practice (at this site) is applicable to the following SUPPORT BUSINESS categories provided below by writing in the percentage to the right of the category.**

Broker	<input type="text"/>
Materials exchange services	<input type="text"/>
Recycling and reuse equipment manufacturer	<input type="text"/>
Transporter	<input type="text"/>

**13. Please indicate what percentage of your business practice (at this site) are applicable to the following OTHER categories provided below by writing in the percentage to the right of the category.**

Other recycling processor / manufacturer	<input type="text"/>
Other reuse / remanufacturer	<input type="text"/>

**14. Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.**

Full Time Employees (whole number)	<input type="text"/>
------------------------------------	----------------------

**15. Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.**

Total Part Time Employees for location (whole number)	<input type="text"/>
---	----------------------

**16. What was the average number of hours PART TIME employees worked per week in 2013?**

Average number of hours for location (whole number)	<input type="text"/>
---	----------------------

**17. What was the total payroll associated at this site in 2013?**

Total Annual Payroll for location (whole number)	<input type="text"/>
--	----------------------

**18. Please indicate the number of employees within the following salary ranges:**

Less than \$15,000	<input type="text"/>
\$15,000 - \$25,000	<input type="text"/>
\$25,000 - \$50,000	<input type="text"/>
Over \$50,000	<input type="text"/>

**19. What was the total amount of revenue associated with recycling at this site in 2013?**

Total revenue for location (whole number)	<input type="text"/>
Total recycling revenue (whole number)	<input type="text"/>

**20. Please indicate the TOTAL amount paid in taxes for each of the following categories in 2013.**

Federal \$

State \$

Local \$

**21. Please indicate where your recycling-related products are sold (mark all that apply).  
If recycling-related products are sold out of state please explain in the comment box.**

- To businesses within the state of Colorado
- To businesses outside the state of Colorado
- Not applicable

Comment:

**22. Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?**

- Yes
- No
- Not applicable

**23. Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?**

- Yes
- No
- Not applicable

**24. If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:**

- 0-10 miles
- 10-50 miles
- 50-100 miles
- Greater than 100 miles

**25. If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:**

0-10 miles	<input type="text"/>
0-50 miles	<input type="text"/>
50-100 miles	<input type="text"/>
Greater than 100 miles	<input type="text"/>

**26. Please provide any additional information and/or comments here:**

## **Appendix B**

### **Email Sent to RRR Industry Representatives and Survey Recipients**



RE: Colorado Department of Public Health and Environment (CDPHE) Economics of Recycling Survey

The State of Colorado Department of Public Health and Environment (CDPHE) is striving to implement programs and policies that are more feasible, effective, and beneficial for waste diversion in the State. Such efforts would not only improve the environment and quality of life in Colorado, but also benefit individual recycling, remanufacturing, and reuse (RRR) firms by attracting new businesses, markets, and end-users to Colorado. In order to do that, the Department has hired ENVIRON International Corporation (ENVIRON), a leading international environmental consulting firm, to study the economic impacts of waste diversion activities within the State. The overall purpose of this study is to identify the contribution of the RRR industries on the Colorado economy. A letter explaining the study, from Martha E. Rudolph, CDPHE Director of Environmental Programs, is attached for your additional information.

In order to gather data for this analysis, a survey of RRR firms has been developed. State-wide surveys like this have been done elsewhere in the US, but this will be the first study of its kind done in Colorado. The data will allow CDPHE to tailor programs, policies, and incentives to better support the state's waste diversion activities. Further, investors from around the nation could use the results of this survey to identify Colorado's market potential based on the available feedstock of recyclables, compost, and the extent of the reuse and remanufacturing industries.

You have been selected as one of the contacts we are requesting to participate in the survey. It would be very helpful if you could **take a few minutes** to complete the online survey using the **link below**. Please be assured that **all information will be kept confidential** and no individual information will be provided to other parties. CDPHE will not request, or be entitled to see, any individual respondent data. All information will be processed, compiled, and consolidated prior to analysis and distribution, so as not to disclose any individual firm- or site-specific data. Results will only be used once aggregated to industrial sector. We would appreciate your response by close of business Friday, July 18. If you think you may not be able to complete the survey by this date, or have any concerns about the study, please let us know as soon as possible so we can send it to another contact.

Survey link: [https://www.surveymonkey.com/s/Colorado\\_Economics\\_of\\_Recycling\\_Survey](https://www.surveymonkey.com/s/Colorado_Economics_of_Recycling_Survey)

Your participation in the survey is appreciated and would be beneficial to the Department and to the Colorado RRR industry overall. If you have any questions, or need further information, please contact Maitri Dirmeyer from ENVIRON at 503-353-1734 or [mdirmeyer@environcorp.com](mailto:mdirmeyer@environcorp.com). The contact at the Department is Eric Heyboer. He can be reached at 303-691-4955 or [eric.heyboer@state.co.us](mailto:eric.heyboer@state.co.us). Please note that Maitri Dirmeyer will call you next week to follow up and see if you have any questions.

Thank you very much.

Sincerely,

Maitri Dirmeyer

## **Appendix C**

**Letter from Colorado Department of Public Health and Environment to RRR  
Industry Representatives and Survey Recipients Sent as an Attachment with the  
Survey Request Email**

Date

Dear Recycling, Remanufacturing, and Reuse (RRR) Industry Representative,

As you may know, the Colorado Department of Public Health and Environment (Department) is developing a study on the economics of recycling in Colorado and will soon be launching a survey to collect information from the RRR industry. ENVIRON International Corporation (ENVIRON) has been selected to conduct the survey and the study. ENVIRON is a leading international environmental consulting firm with over 80 regional offices in the U.S. and worldwide.

The team assembled for this work will be locally based in ENVIRON's Denver, CO office. Carolyn Nobel is leading the effort, with the assistance of Gretchen Greene, PhD and Jeri Sawyer, MS in ENVIRON's Clackamas OR office, each of whom has 10 years or more of experience managing and implementing research on environmental projects throughout the United States. They will be working together on the interviewing, information gathering, economic analysis, and report preparation processes.

Your participation in the survey is appreciated and would be beneficial to the Department and to the Colorado RRR industry overall. Please be prepared to respond to the ENVIRON team's requests for phone interviews and/or online survey questions. Your responses are critical to the success of this project, and to charting a successful future for the RRR industry in areas such as setting strategic goals, implementing feasible and effective programs and policies, attracting new businesses, markets, and end-users to Colorado, and to realistically track economic progress. Thank you.

Sincerely,

[signer]

Colorado Department of Public Health and Environment

## **Appendix D**

### **Select Survey Responses by Business Category**

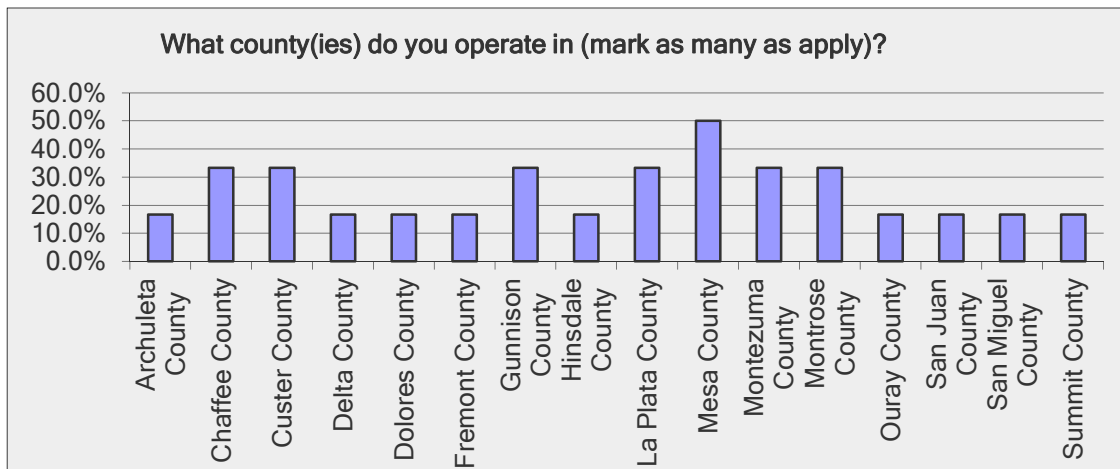
## **Appendix D**

### **Survey Responses by Business Category**

## Economic Study of Recycling in Colorado-Broker

What county(ies) do you operate in (mark as many as apply)?

Answer Options	Response Percent	Response Count
Archuleta County	16.7%	1
Chaffee County	33.3%	2
Custer County	33.3%	2
Delta County	16.7%	1
Dolores County	16.7%	1
Fremont County	16.7%	1
Gunnison County	33.3%	2
Hinsdale County	16.7%	1
La Plata County	33.3%	2
Mesa County	50.0%	3
Montezuma County	33.3%	2
Montrose County	33.3%	2
Ouray County	16.7%	1
San Juan County	16.7%	1
San Miguel County	16.7%	1
Summit County	16.7%	1
<b>answered question</b>		<b>6</b>
<b>skipped question</b>		<b>0</b>

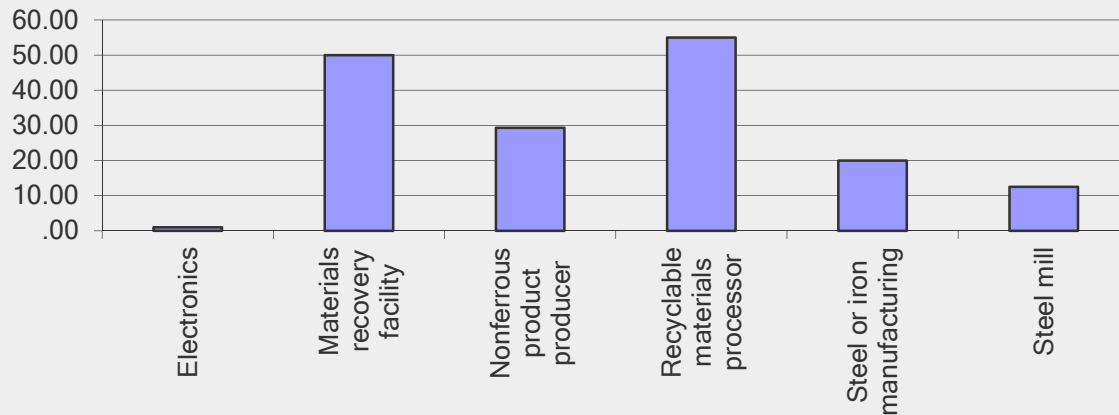


## Economic Study of Recycling in Colorado-Broker

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total
Electronics	1.00	3
Materials recovery facility	50.00	200
Nonferrous product producer	29.33	88
Recyclable materials processor	55.00	165
Steel or iron manufacturing	20.00	20
Steel mill	12.50	25
		<i>answered question</i>
		<i>skipped question</i>

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.



## Economic Study of Recycling in Colorado-Broker

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	.00		3
Equipment or toner cartridge remanufacturer	.00		3
Motor vehicle part manufacturer	.00		3
Retail used merchandise sales	.00		3
Wood reuse or pallet rebuilder	.00		3
		<i>answered question</i>	<b>3</b>
		<i>skipped question</i>	<b>3</b>



### Economic Study of Recycling in Colorado-Broker

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	13.80	69	5
		<i>answered question</i>	5
		<i>skipped question</i>	1

### Economic Study of Recycling in Colorado-Broker

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	.75	3	4
		<i>answered question</i>	4
		<i>skipped question</i>	2

### Economic Study of Recycling in Colorado-Broker

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	2.00	10	5
		<i>answered question</i>	5
		<i>skipped question</i>	1

### Economic Study of Recycling in Colorado-Broker

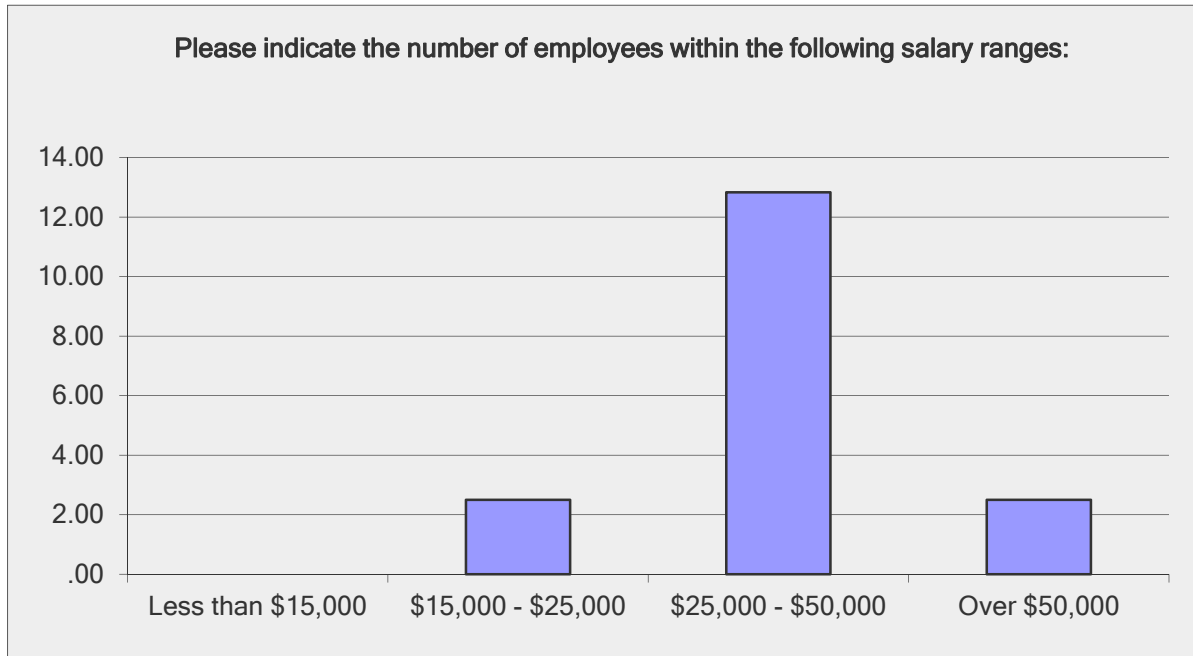
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	200,000.00	200,000	1
		<i>answered question</i>	1
		<i>skipped question</i>	5

## Economic Study of Recycling in Colorado-Broker

Please indicate the number of employees within the following salary ranges:

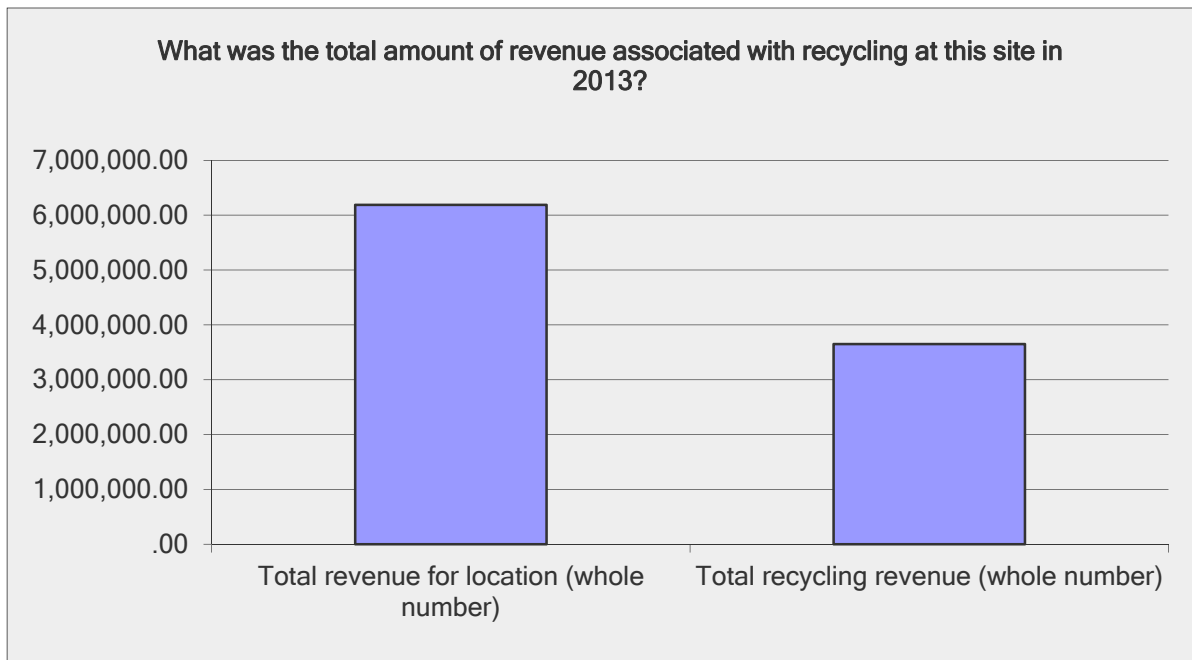
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	.00		1
\$15,000 - \$25,000	2.50	5	2
\$25,000 - \$50,000	12.83	77	6
Over \$50,000	2.50	10	4
<i>answered question</i>			<b>6</b>
<i>skipped question</i>			<b>0</b>



## Economic Study of Recycling in Colorado-Broker

What was the total amount of revenue associated with recycling at this site in 2013?

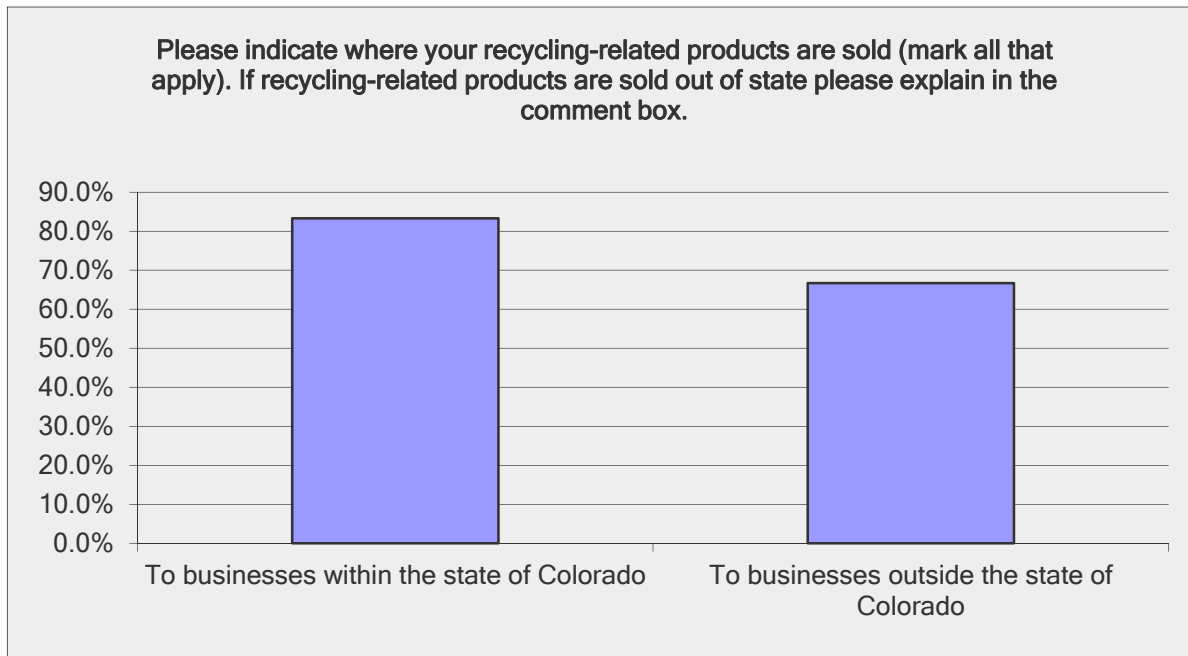
Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	6,187,500.00	12,375,000	2
Total recycling revenue (whole number)	3,650,000.00	7,300,000	2
<i>answered question</i>			<b>2</b>
<i>skipped question</i>			<b>4</b>



## Economic Study of Recycling in Colorado-Broker

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

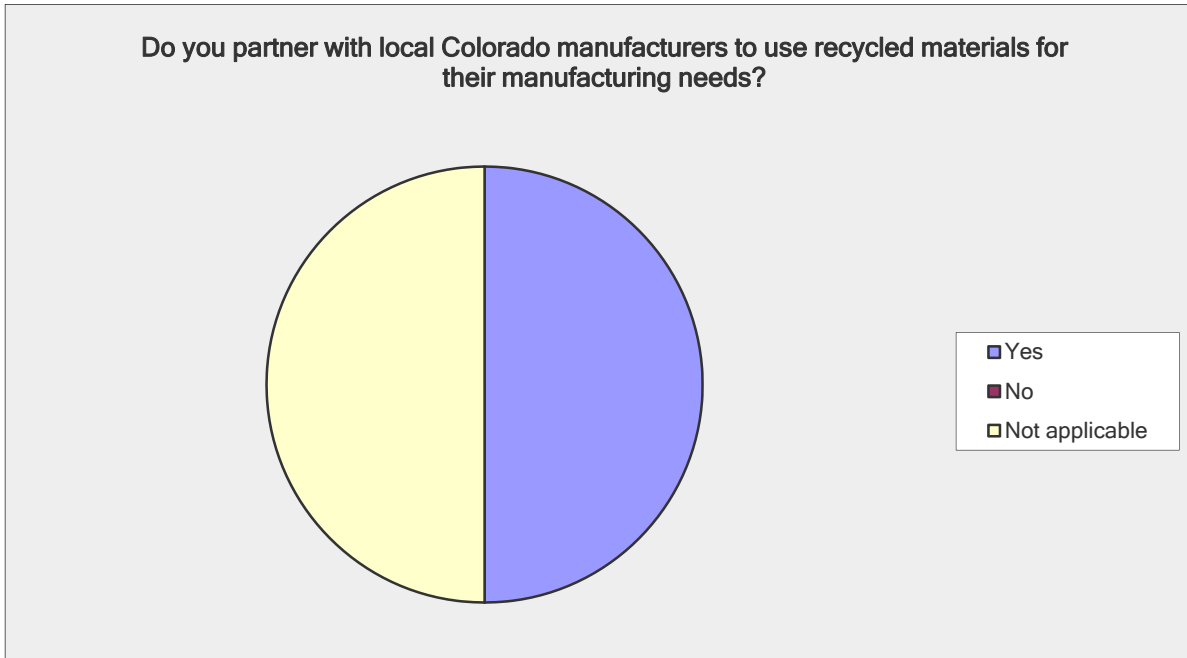
Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	83.3%	5
To businesses outside the state of Colorado	66.7%	4
Comment:		4
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>0</b>



## Economic Study of Recycling in Colorado-Broker

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

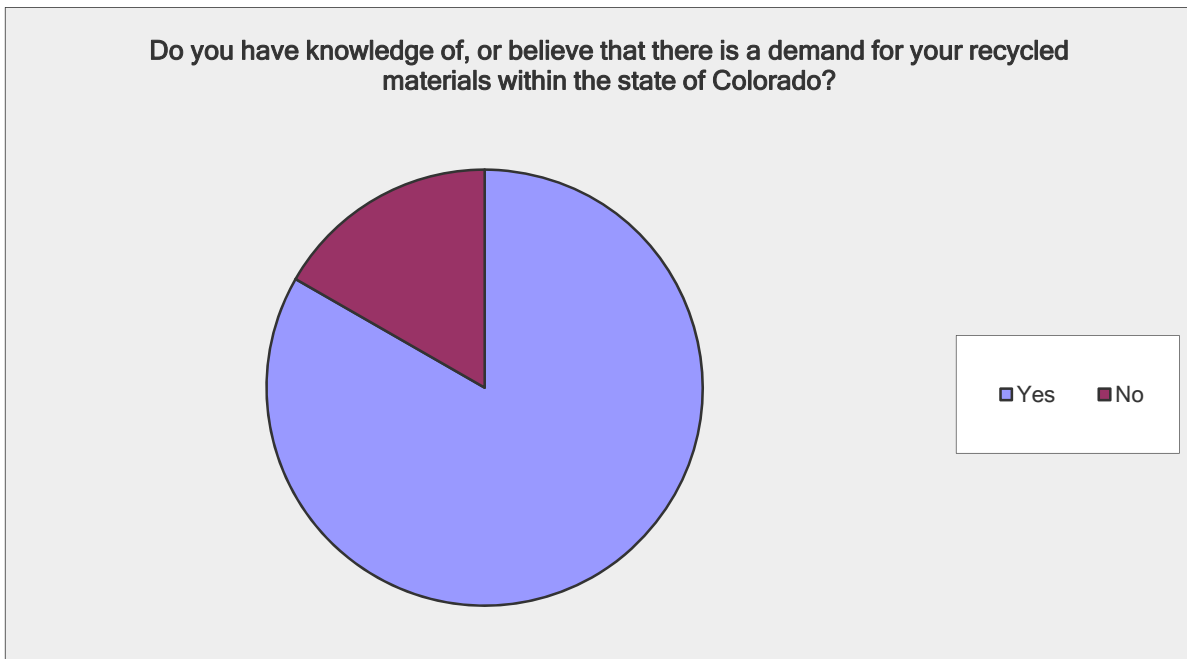
Answer Options	Response Percent	Response Count
Yes	50.0%	3
No	0.0%	0
Not applicable	50.0%	3
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>0</b>



## Economic Study of Recycling in Colorado-Broker

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	83.3%	5
No	16.7%	1
<i>answered question</i>		6
<i>skipped question</i>		0

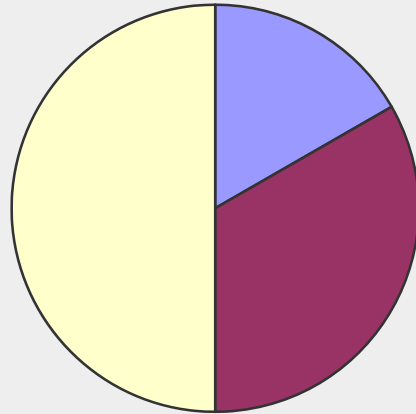


## Economic Study of Recycling in Colorado-Broker

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
10-50 miles	16.7%	1
50-100 miles	33.3%	2
Greater than 100 miles	50.0%	3
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>0</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

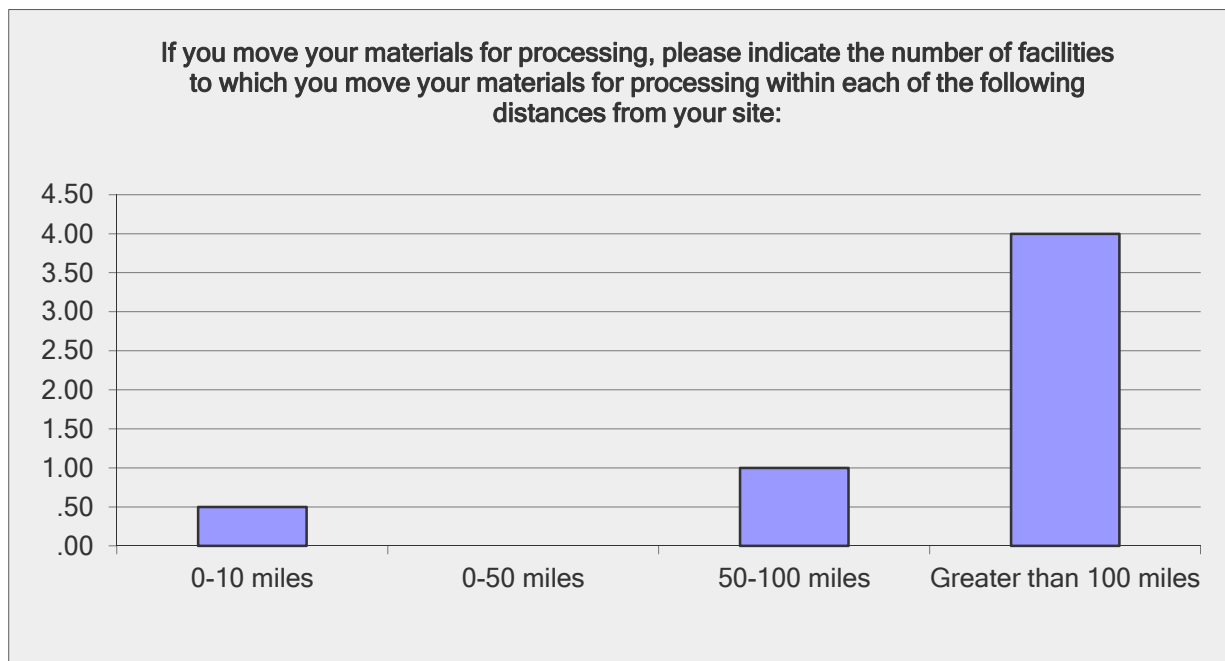


- 10-50 miles
- 50-100 miles
- Greater than 100 miles

## Economic Study of Recycling in Colorado-Broker

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

Answer Options	Response Average	Response Total	Response Count
0-10 miles	.50	1	2
0-50 miles	.00		1
50-100 miles	1.00	4	4
Greater than 100 miles	4.00	20	5
<i>answered question</i>			<b>5</b>
<i>skipped question</i>			<b>1</b>

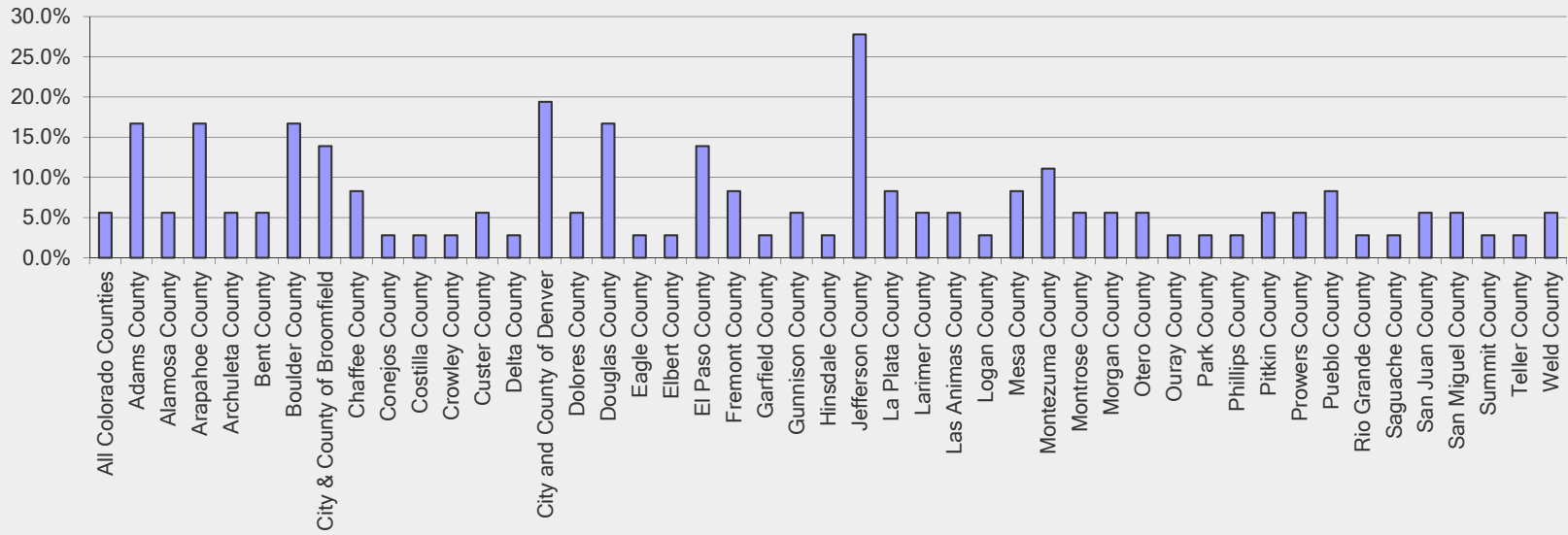




## Economic Study of Recycling in Colorado-Collector

What county(ies) do you operate in (mark as many as apply)?		
Answer Options	Response Percent	Response Count
All Colorado Counties	5.6%	2
Adams County	16.7%	6
Alamosa County	5.6%	2
Arapahoe County	16.7%	6
Archuleta County	5.6%	2
Bent County	5.6%	2
Boulder County	16.7%	6
City & County of Broomfield	13.9%	5
Chaffee County	8.3%	3
Conejos County	2.8%	1
Costilla County	2.8%	1
Crowley County	2.8%	1
Custer County	5.6%	2
Delta County	2.8%	1
City and County of Denver	19.4%	7
Dolores County	5.6%	2
Douglas County	16.7%	6
Eagle County	2.8%	1
Elbert County	2.8%	1
El Paso County	13.9%	5
Fremont County	8.3%	3
Garfield County	2.8%	1
Gunnison County	5.6%	2
Hinsdale County	2.8%	1
Jefferson County	27.8%	10
La Plata County	8.3%	3
Larimer County	5.6%	2
Las Animas County	5.6%	2
Logan County	2.8%	1
Mesa County	8.3%	3
Montezuma County	11.1%	4
Montrose County	5.6%	2
Morgan County	5.6%	2
Otero County	5.6%	2
Ouray County	2.8%	1
Park County	2.8%	1
Phillips County	2.8%	1
Pitkin County	5.6%	2
Prowers County	5.6%	2
Pueblo County	8.3%	3
Rio Grande County	2.8%	1
Saguache County	2.8%	1
San Juan County	5.6%	2
San Miguel County	5.6%	2
Summit County	2.8%	1
Teller County	2.8%	1
Weld County	5.6%	2
<i>answered question</i>		<b>36</b>
<i>skipped question</i>		<b>1</b>

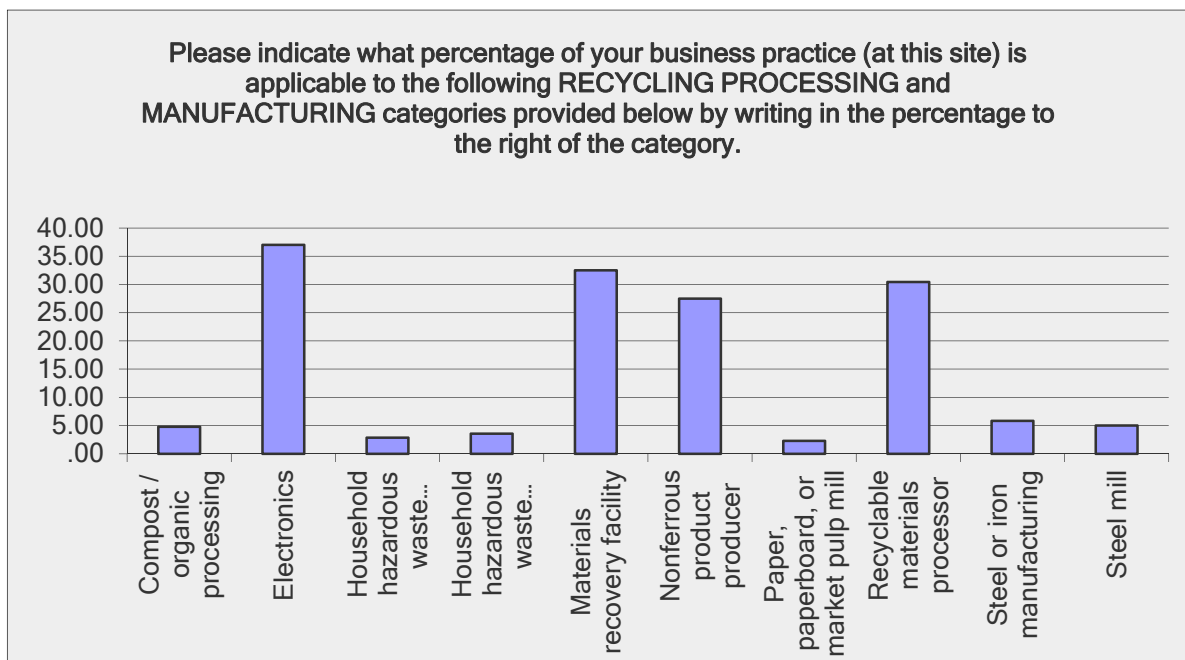
What county(ies) do you operate in (mark as many as apply)?



## Economic Study of Recycling in Colorado-Collector

Please indicate what percentage of your business practice (at this site) is applicable to the following **RECYCLING PROCESSING** and **MANUFACTURING** categories provided below by writing in the percentage to the right of the category.

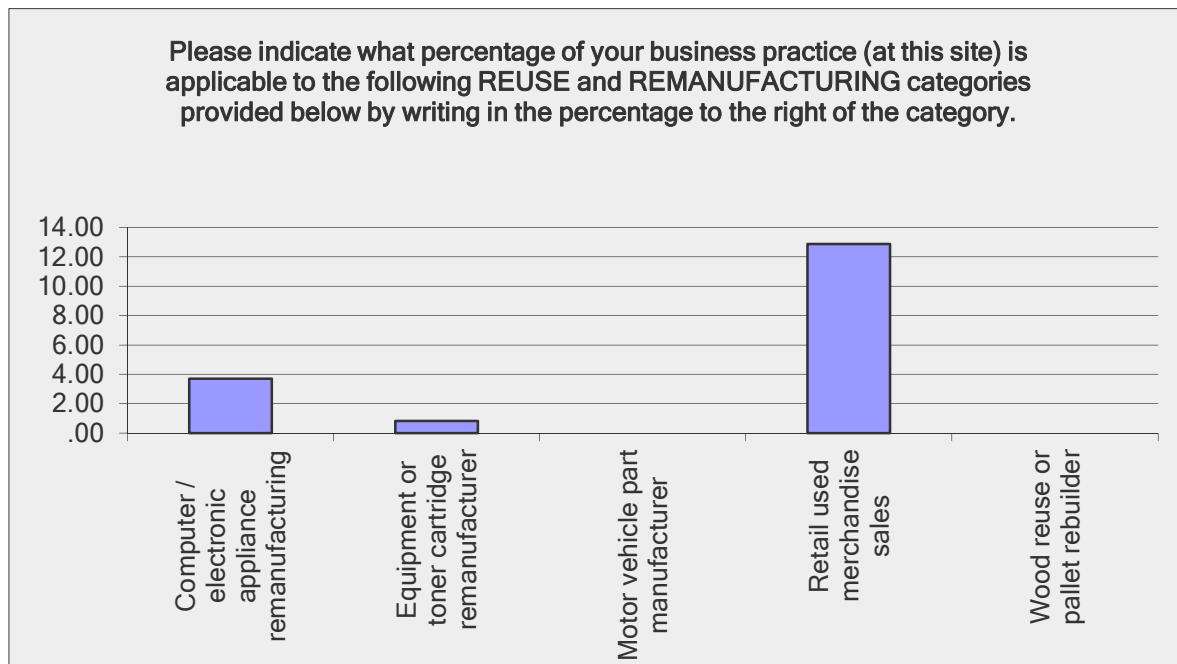
Answer Options	Response Average	Response Total	Response Count
Compost / organic processing	4.78	43	9
Electronics	37.00	518	14
Household hazardous waste processor	2.86	20	7
Household hazardous waste processor-Paint	3.57	25	7
Materials recovery facility	32.50	325	10
Nonferrous product producer	27.50	220	8
Paper, paperboard, or market pulp mill	2.29	16	7
Recyclable materials processor	30.43	213	7
Steel or iron manufacturing	5.83	35	6
Steel mill	5.00	25	5
<i>answered question</i>			<b>21</b>
<i>skipped question</i>			<b>16</b>



## Economic Study of Recycling in Colorado-Collector

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	3.70	37	10
Equipment or toner cartridge remanufacturer	.83	5	6
Motor vehicle part manufacturer	.00		6
Retail used merchandise sales	12.88	103	8
Wood reuse or pallet rebuilder	.00		6
<i>answered question</i>			<b>11</b>
<i>skipped question</i>			<b>26</b>



### Economic Study of Recycling in Colorado-Collector

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	61.68	1,912	31
		<i>answered question</i>	<b>31</b>
		<i>skipped question</i>	<b>6</b>

### Economic Study of Recycling in Colorado-Collector

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	26.44	714	27
		<i>answered question</i>	<b>28</b>
		<i>skipped question</i>	<b>9</b>

### Economic Study of Recycling in Colorado-Collector

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	15.56	389	25
		<i>answered question</i>	<b>25</b>
		<i>skipped question</i>	<b>12</b>

### Economic Study of Recycling in Colorado-Collector

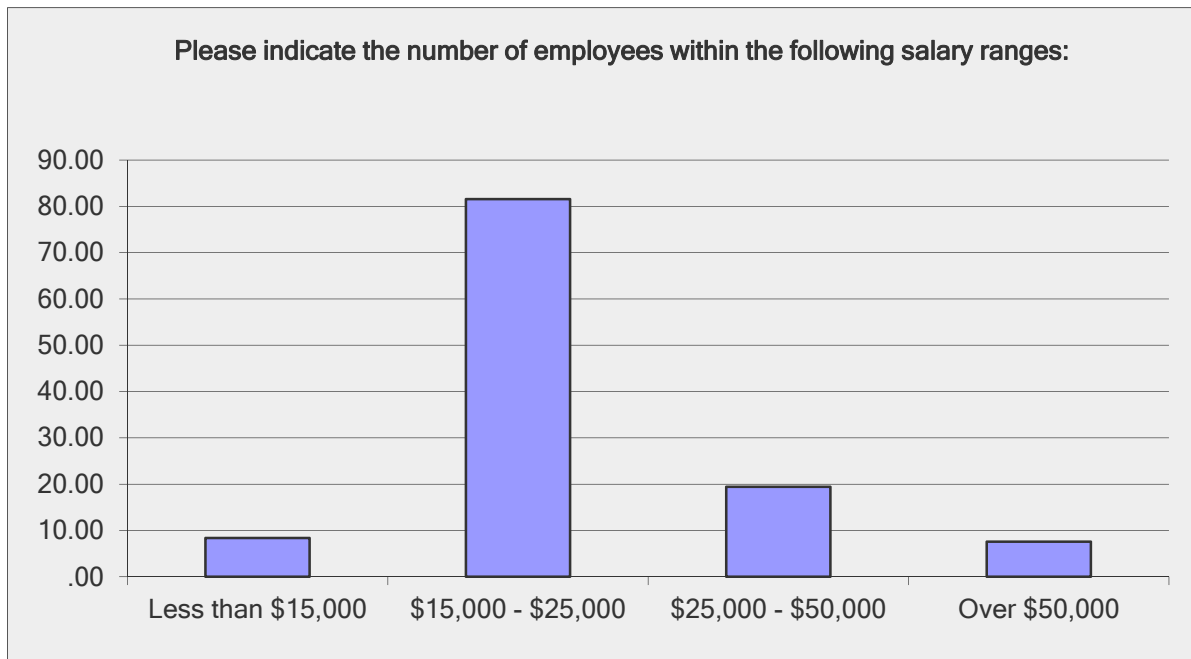
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	2,099,419.00	37,789,542	18
		<i>answered question</i>	<b>18</b>
		<i>skipped question</i>	<b>19</b>

## Economic Study of Recycling in Colorado-Collector

Please indicate the number of employees within the following salary ranges:

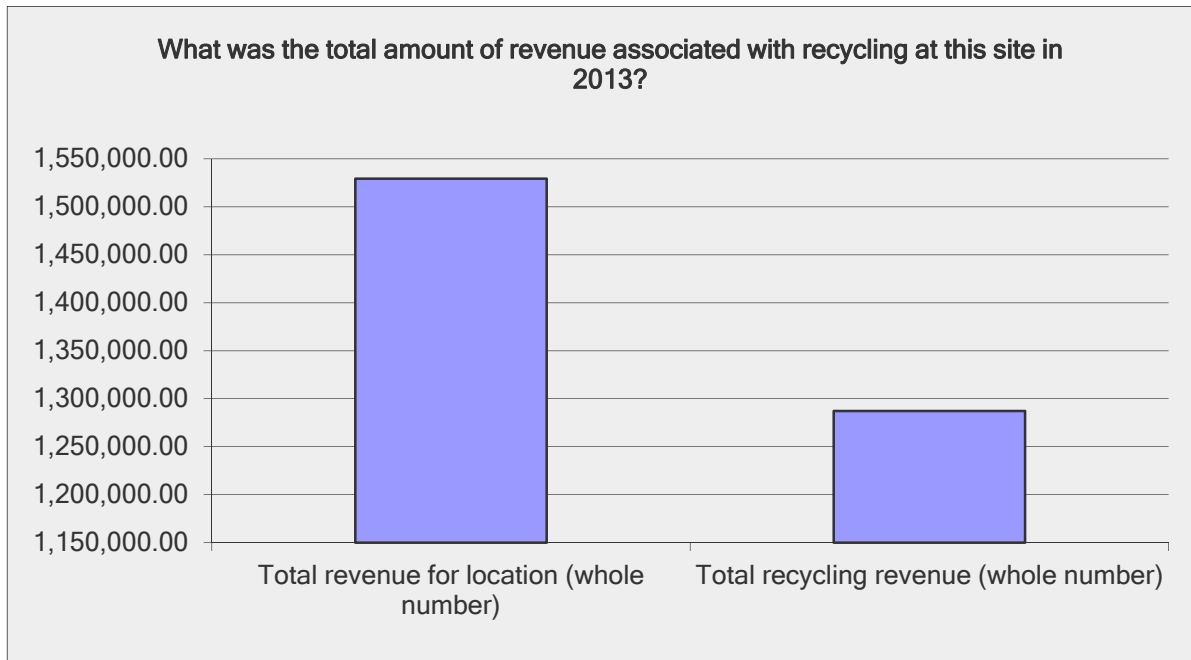
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	8.36	117	14
\$15,000 - \$25,000	81.57	1,142	14
\$25,000 - \$50,000	19.44	486	25
Over \$50,000	7.58	144	19
<i>answered question</i>			<b>30</b>
<i>skipped question</i>			<b>7</b>



## Economic Study of Recycling in Colorado-Collector

What was the total amount of revenue associated with recycling at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	1,529,252.22	27,526,540	18
Total recycling revenue (whole number)	1,287,168.16	24,456,195	19
<i>answered question</i>			<b>20</b>
<i>skipped question</i>			<b>17</b>

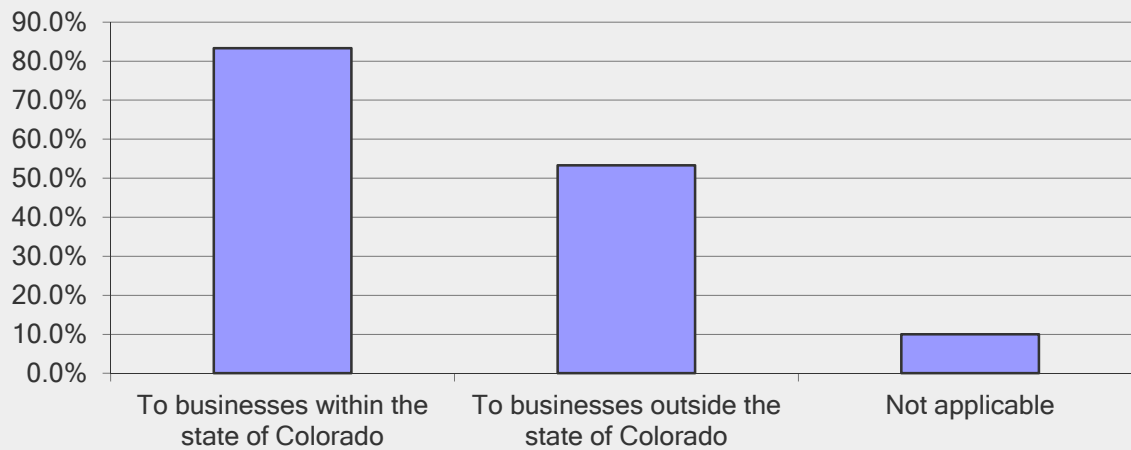


## Economic Study of Recycling in Colorado-Collector

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	83.3%	25
To businesses outside the state of Colorado	53.3%	16
Not applicable	10.0%	3
Comment:		13
<i>answered question</i>		<b>30</b>
<i>skipped question</i>		<b>7</b>

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.



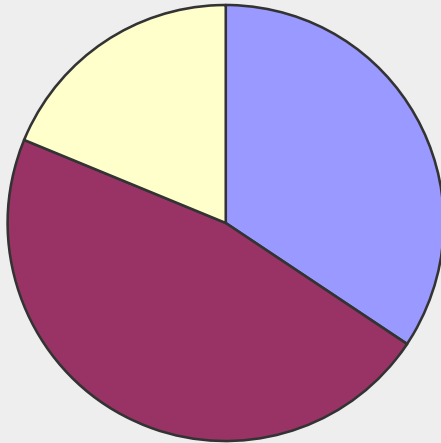


## Economic Study of Recycling in Colorado-Collector

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	34.4%	11
No	46.9%	15
Not applicable	18.8%	6
<i>answered question</i>		<b>32</b>
<i>skipped question</i>		<b>5</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?



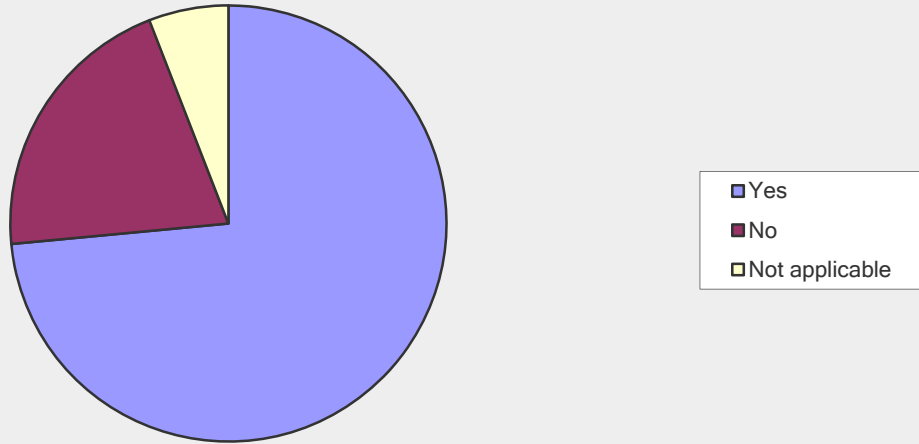
■ Yes  
■ No  
■ Not applicable

## Economic Study of Recycling in Colorado-Collector

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	73.5%	25
No	20.6%	7
Not applicable	5.9%	2
<i>answered question</i>		<b>34</b>
<i>skipped question</i>		<b>3</b>

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

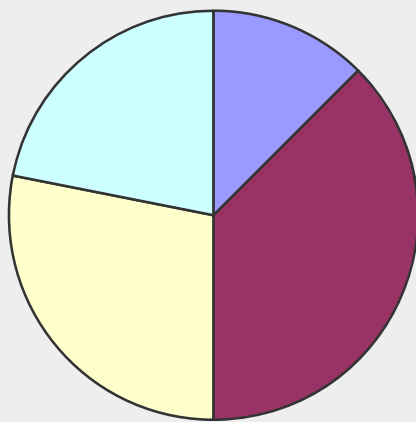


## Economic Study of Recycling in Colorado-Collector

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	12.5%	4
10-50 miles	37.5%	12
50-100 miles	28.1%	9
Greater than 100 miles	21.9%	7
<i>answered question</i>		<b>32</b>
<i>skipped question</i>		<b>5</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

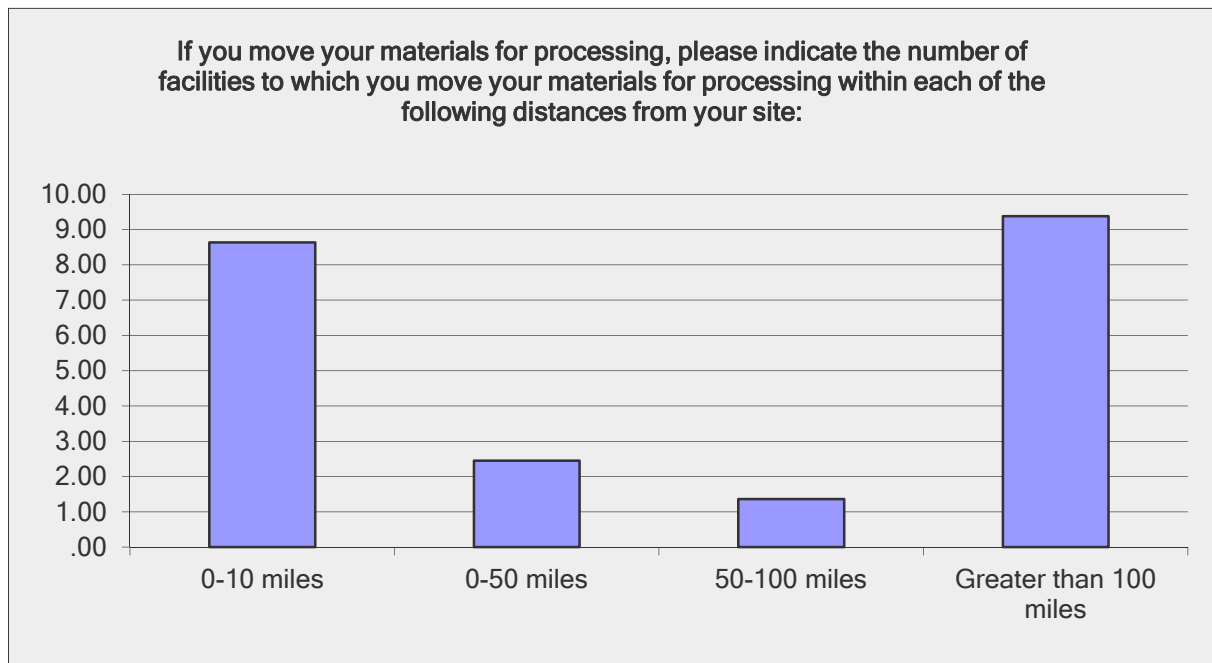


- 0-10 miles
- 10-50 miles
- 50-100 miles
- Greater than 100 miles

## Economic Study of Recycling in Colorado-Collector

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

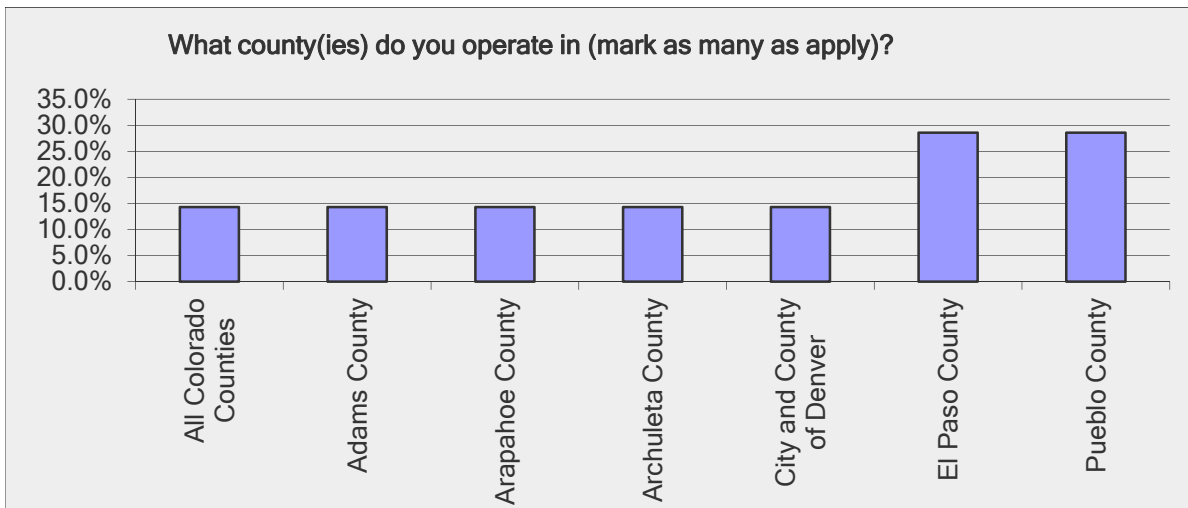
Answer Options	Response Average	Response Total	Response Count
0-10 miles	8.64	121	14
0-50 miles	2.45	27	11
50-100 miles	1.36	19	14
Greater than 100 miles	9.38	150	16
<i>answered question</i>			<b>24</b>
<i>skipped question</i>			<b>13</b>



## Economic Study of Recycling in Colorado-Manufacturer

What county(ies) do you operate in (mark as many as apply)?

Answer Options	Response Percent	Response Count
All Colorado Counties	14.3%	1
Adams County	14.3%	1
Arapahoe County	14.3%	1
Archuleta County	14.3%	1
City and County of Denver	14.3%	1
El Paso County	28.6%	2
Pueblo County	28.6%	2
<i>answered question</i>		<b>7</b>
<i>skipped question</i>		<b>1</b>

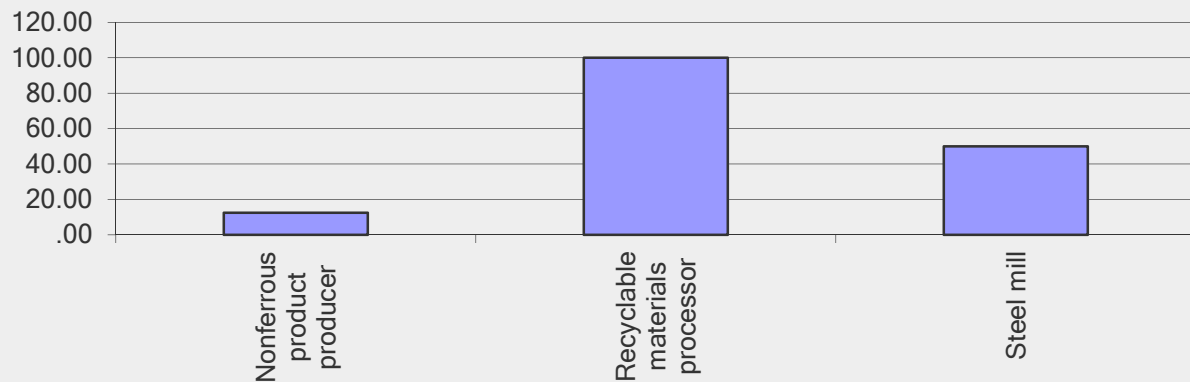


## Economic Study of Recycling in Colorado-Manufacturer

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Nonferrous product producer	12.50	25	2
Recyclable materials processor	100.00	100	1
Steel mill	50.00	100	2
<i>answered question</i>			<b>3</b>
<i>skipped question</i>			<b>5</b>

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.



## Economic Study of Recycling in Colorado-Manufacturer

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	.00		1
Equipment or toner cartridge remanufacturer	.00		1
Motor vehicle part manufacturer	.00		1
Retail used merchandise sales	.00		1
Wood reuse or pallet rebuilder	.00		1
		<i>answered question</i>	<b>1</b>
		<i>skipped question</i>	<b>7</b>

### Economic Study of Recycling in Colorado-Manufacturer

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	184.29	1,290	7
		<i>answered question</i>	7
		<i>skipped question</i>	1

### Economic Study of Recycling in Colorado-Manufacturers

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	1.25	5	4
		<i>answered question</i>	4
		<i>skipped question</i>	4

### Economic Study of Recycling in Colorado-Manufacturers

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	15.00	45	3
		<i>answered question</i>	3
		<i>skipped question</i>	5

### Economic Study of Recycling in Colorado-Manufacturers

What was the total payroll associated at this site in 2013?

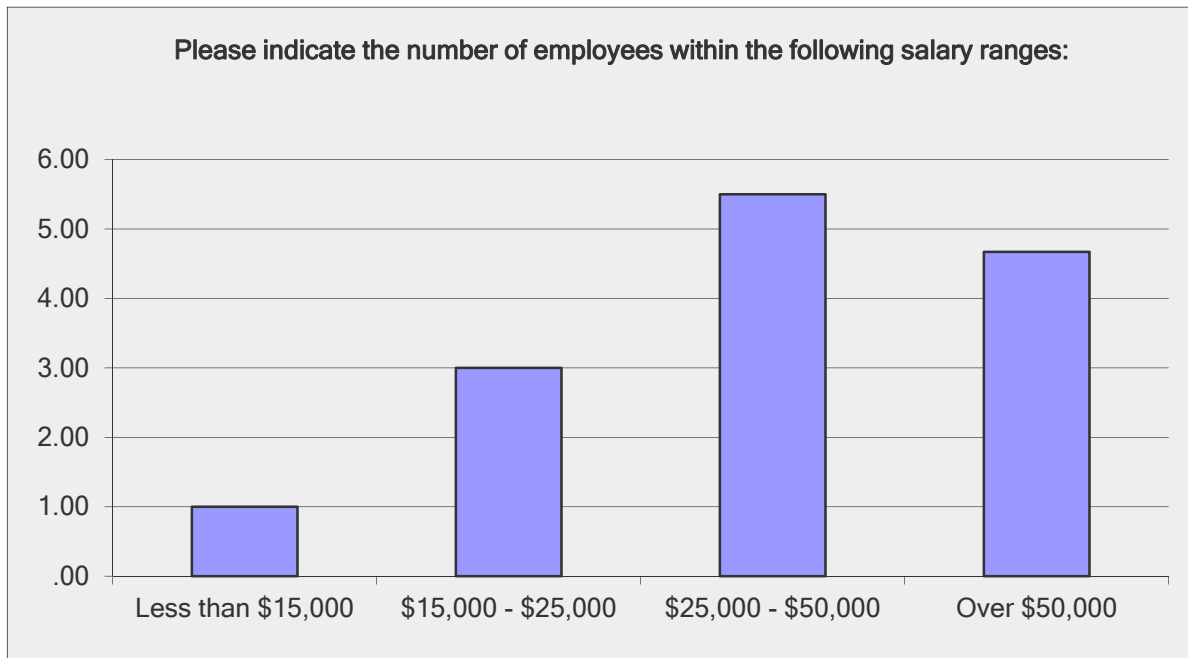
Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	160,000.00	480,000	3
		<i>answered question</i>	3
		<i>skipped question</i>	5



## Economic Study of Recycling in Colorado-Manufacturer

Please indicate the number of employees within the following salary ranges:

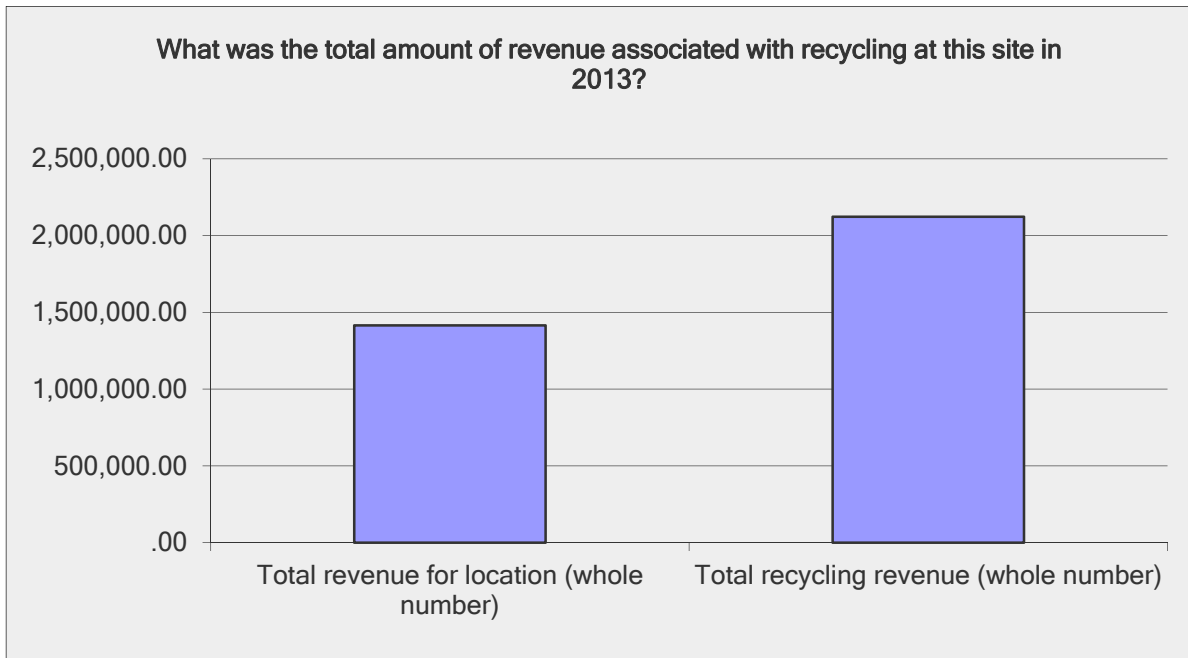
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	1.00	2	2
\$15,000 - \$25,000	3.00	9	3
\$25,000 - \$50,000	5.50	11	2
Over \$50,000	4.67	14	3
<i>answered question</i>			<b>4</b>
<i>skipped question</i>			<b>4</b>



## Economic Study of Recycling in Colorado-Manufacturer

What was the total amount of revenue associated with recycling at this site in 2013?

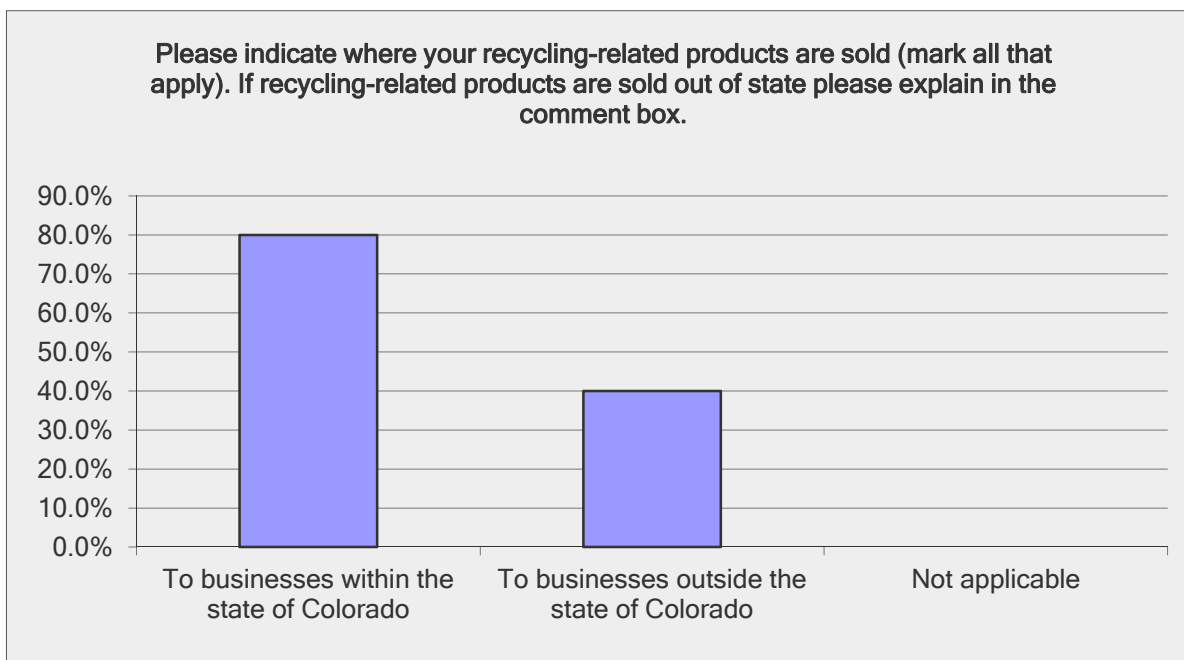
Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	1,414,833.33	4,244,500	3
Total recycling revenue (whole number)	2,122,250.00	4,244,500	2
<i>answered question</i>			<b>3</b>
<i>skipped question</i>			<b>5</b>



## Economic Study of Recycling in Colorado-Manufacturer

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	80.0%	4
To businesses outside the state of Colorado	40.0%	2
Not applicable	0.0%	0
Comment:		1
<i>answered question</i>		<b>5</b>
<i>skipped question</i>		<b>3</b>

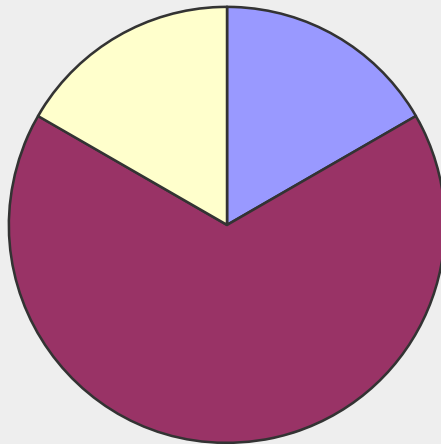


## Economic Study of Recycling in Colorado-Manufacturer

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	16.7%	1
No	66.7%	4
Not applicable	16.7%	1
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>2</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?



- Yes
- No
- Not applicable

## Economic Study of Recycling in Colorado-Manufacturer

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

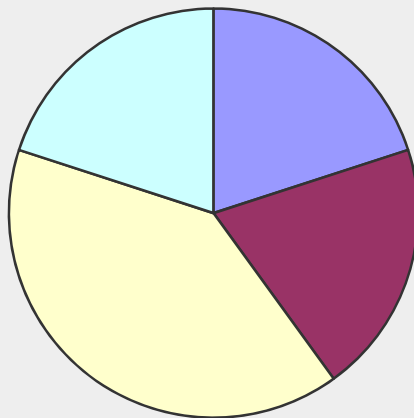
Answer Options	Response Percent	Response Count
Yes	100.0%	6
No	0.0%	0
Not applicable	0.0%	0
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>2</b>

## Economic Study of Recycling in Colorado-Manufacturer

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	20.0%	1
10-50 miles	20.0%	1
50-100 miles	40.0%	2
Greater than 100 miles	20.0%	1
<i>answered question</i>		<b>5</b>
<i>skipped question</i>		<b>3</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:



- 0-10 miles
- 10-50 miles
- 50-100 miles
- Greater than 100 miles

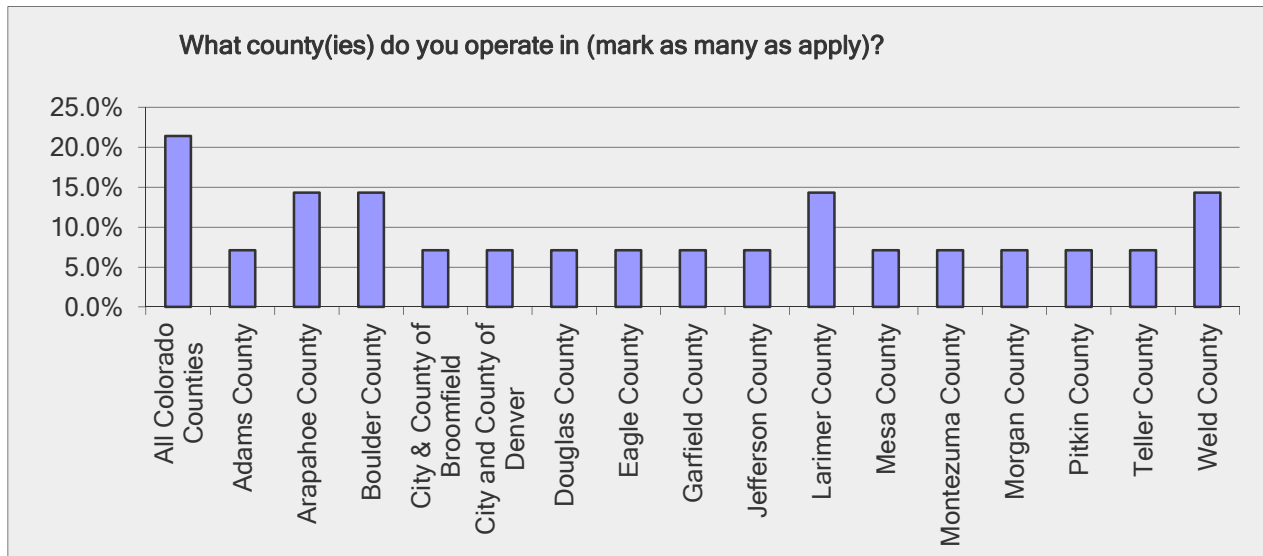
## Economic Study of Recycling in Colorado-Manufacturer

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

Answer Options	Response Average	Response Total	Response Count
0-10 miles	.50	1	2
		<i>answered question</i>	<b>2</b>
		<i>skipped question</i>	<b>6</b>

## Economic Study of Recycling in Colorado-Other

What county(ies) do you operate in (mark as many as apply)?		
Answer Options	Response Percent	Response Count
All Colorado Counties	21.4%	3
Adams County	7.1%	1
Arapahoe County	14.3%	2
Boulder County	14.3%	2
City & County of Broomfield	7.1%	1
City and County of Denver	7.1%	1
Douglas County	7.1%	1
Eagle County	7.1%	1
Garfield County	7.1%	1
Jefferson County	7.1%	1
Larimer County	14.3%	2
Mesa County	7.1%	1
Montezuma County	7.1%	1
Morgan County	7.1%	1
Pitkin County	7.1%	1
Teller County	7.1%	1
Weld County	14.3%	2
<i>answered question</i>		<b>14</b>
<i>skipped question</i>		<b>2</b>



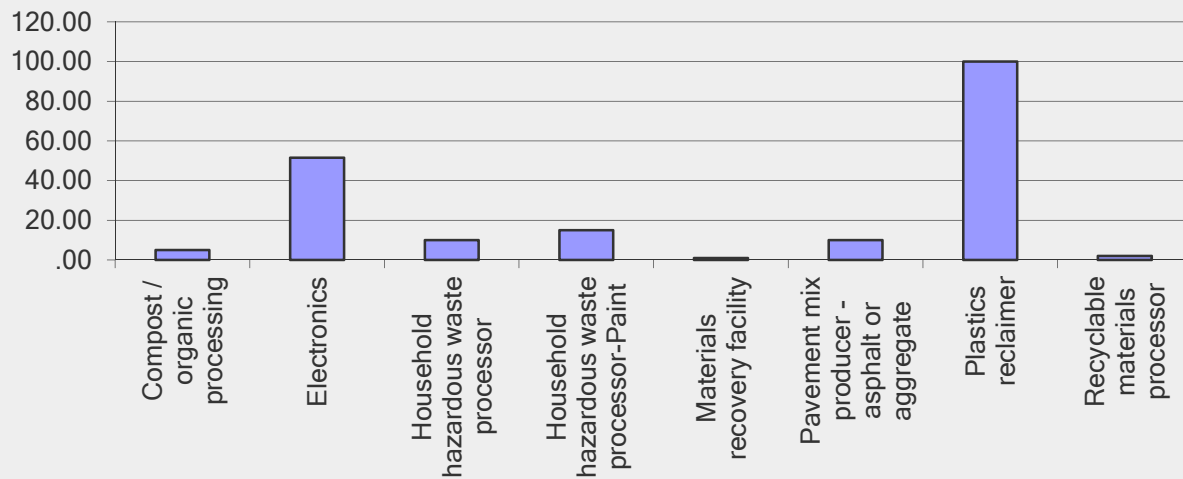


## Economic Study of Recycling in Colorado-Other

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Compost / organic processing	5.00	15	3
Electronics	51.50	206	4
Household hazardous waste processor	10.00	10	1
Household hazardous waste processor-Paint	15.00	15	1
Materials recovery facility	1.00	1	1
Pavement mix producer - asphalt or aggregate	10.00	10	1
Plastics reclaimer	100.00	100	1
Recyclable materials processor	2.00	2	1
		<i>answered question</i>	<b>7</b>
		<i>skipped question</i>	<b>9</b>

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

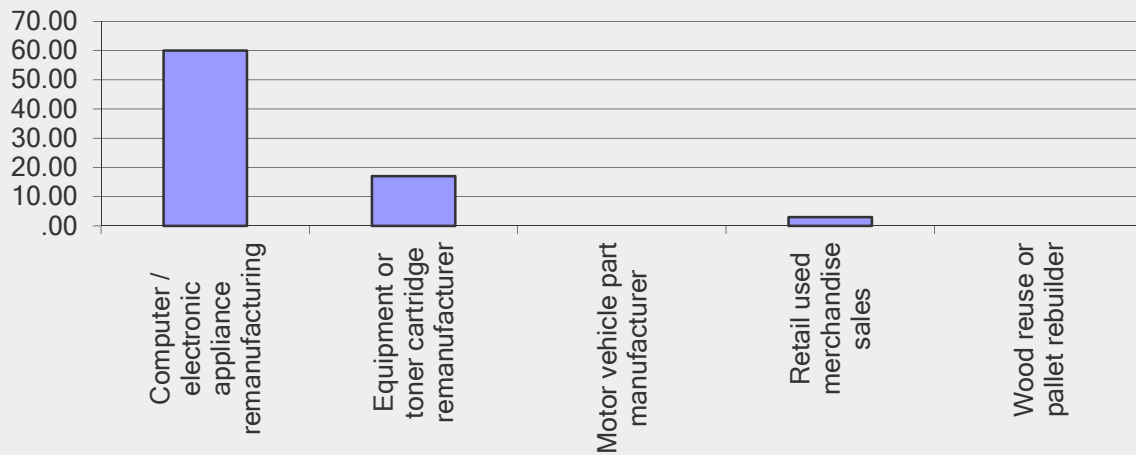


## Economic Study of Recycling in Colorado-Other

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	60.00	180	3
Equipment or toner cartridge remanufacturer	17.00	17	1
Motor vehicle part manufacturer	.00		0
Retail used merchandise sales	3.00	3	1
Wood reuse or pallet rebuilder	.00		0
<i>answered question</i>			<b>3</b>
<i>skipped question</i>			<b>13</b>

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.



### Economic Study of Recycling in Colorado-Other

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	10.00	140	14
		<i>answered question</i>	<b>14</b>
		<i>skipped question</i>	<b>2</b>

### Economic Study of Recycling in Colorado-Other

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	2.62	34	13
		<i>answered question</i>	<b>14</b>
		<i>skipped question</i>	<b>2</b>

### Economic Study of Recycling in Colorado-Other

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	11.15	145	13
		<i>answered question</i>	<b>13</b>
		<i>skipped question</i>	<b>3</b>

### Economic Study of Recycling in Colorado-Other

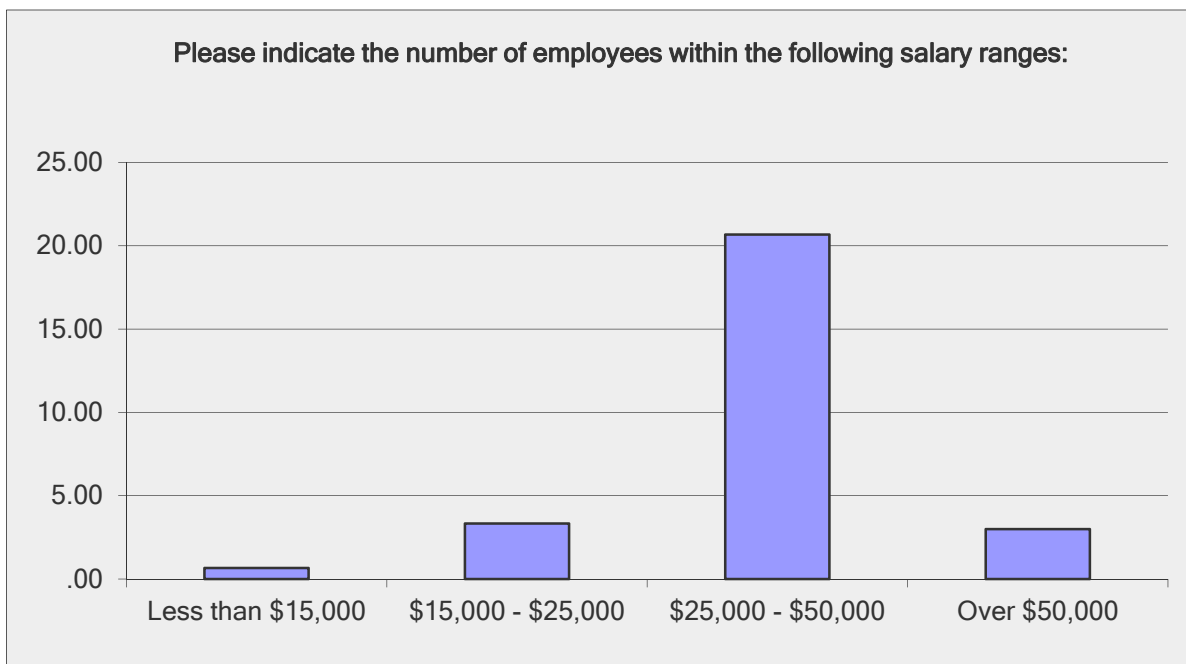
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	296,425.00	2,074,975	7
		<i>answered question</i>	<b>7</b>
		<i>skipped question</i>	<b>9</b>

## Economic Study of Recycling in Colorado-Other

Please indicate the number of employees within the following salary ranges:

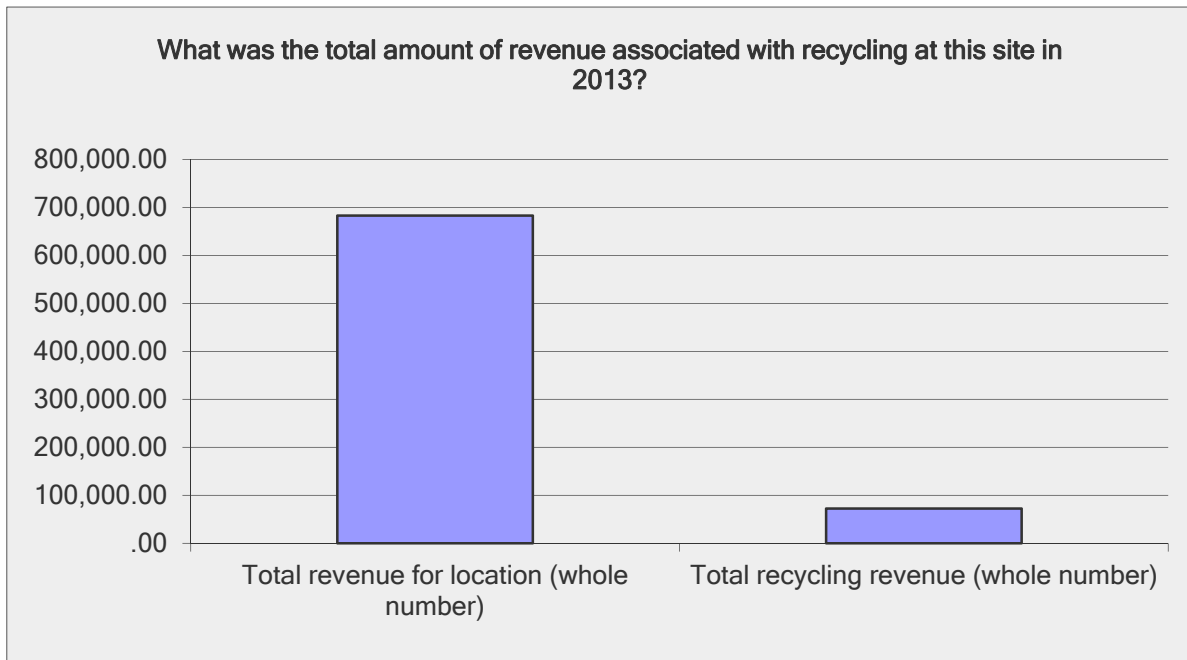
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	.67	2	3
\$15,000 - \$25,000	3.33	20	6
\$25,000 - \$50,000	20.67	124	6
Over \$50,000	3.00	21	7
<i>answered question</i>			<b>11</b>
<i>skipped question</i>			<b>5</b>



## Economic Study of Recycling in Colorado-Other

What was the total amount of revenue associated with recycling at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	682,756.73	7,510,324	11
Total recycling revenue (whole number)	72,374.56	651,371	9
<i>answered question</i>			<b>11</b>
<i>skipped question</i>			<b>5</b>

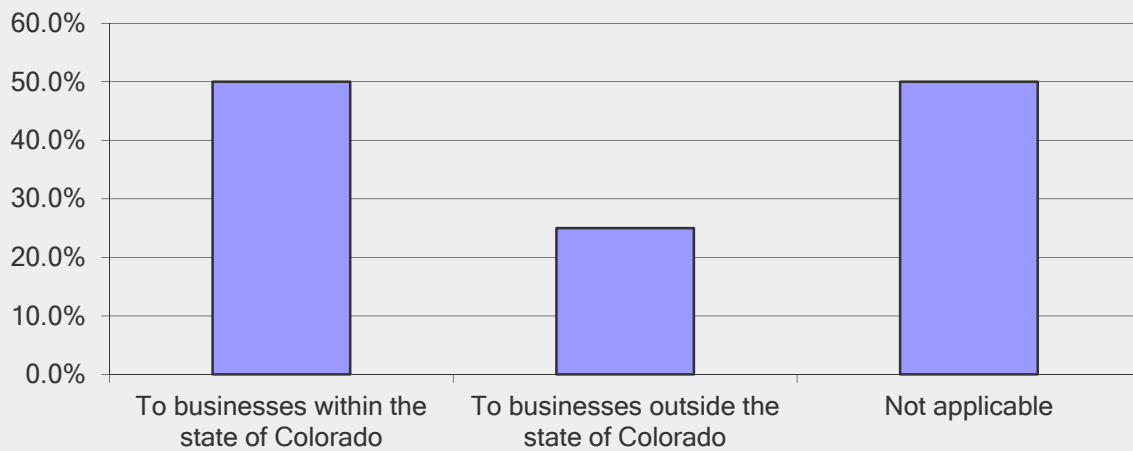


## Economic Study of Recycling in Colorado-Other

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	50.0%	6
To businesses outside the state of Colorado	25.0%	3
Not applicable	50.0%	6
Comment:		7
<i>answered question</i>		<b>12</b>
<i>skipped question</i>		<b>4</b>

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

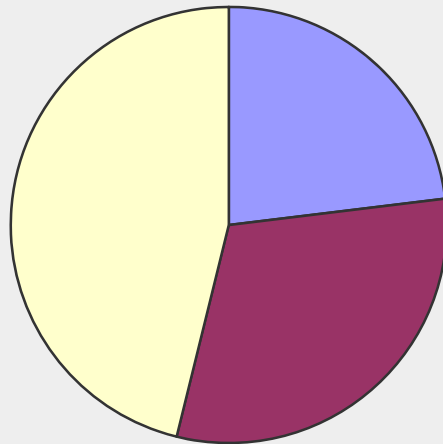


## Economic Study of Recycling in Colorado-Other

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	23.1%	3
No	30.8%	4
Not applicable	46.2%	6
<i>answered question</i>		<b>13</b>
<i>skipped question</i>		<b>3</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?



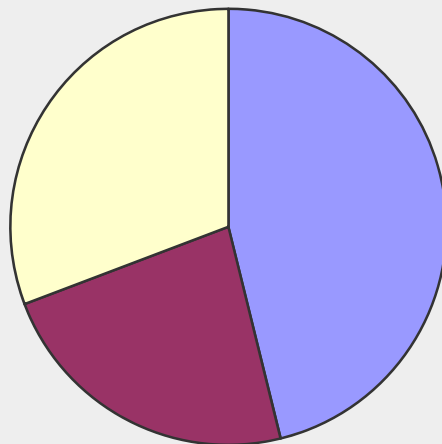
■ Yes  
■ No  
■ Not applicable

## Economic Study of Recycling in Colorado-Other

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	46.2%	6
No	23.1%	3
Not applicable	30.8%	4
<i>answered question</i>		<b>13</b>
<i>skipped question</i>		<b>3</b>

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?



■ Yes  
■ No  
■ Not applicable

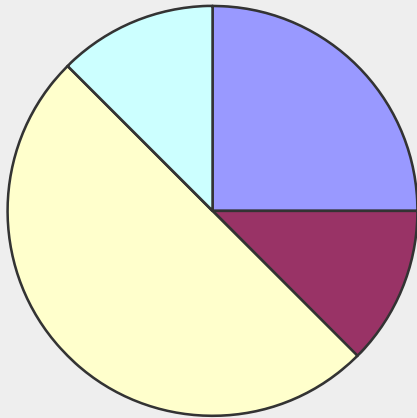


## Economic Study of Recycling in Colorado-Other

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	25.0%	2
10-50 miles	12.5%	1
50-100 miles	50.0%	4
Greater than 100 miles	12.5%	1
<i>answered question</i>		<b>8</b>
<i>skipped question</i>		<b>8</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

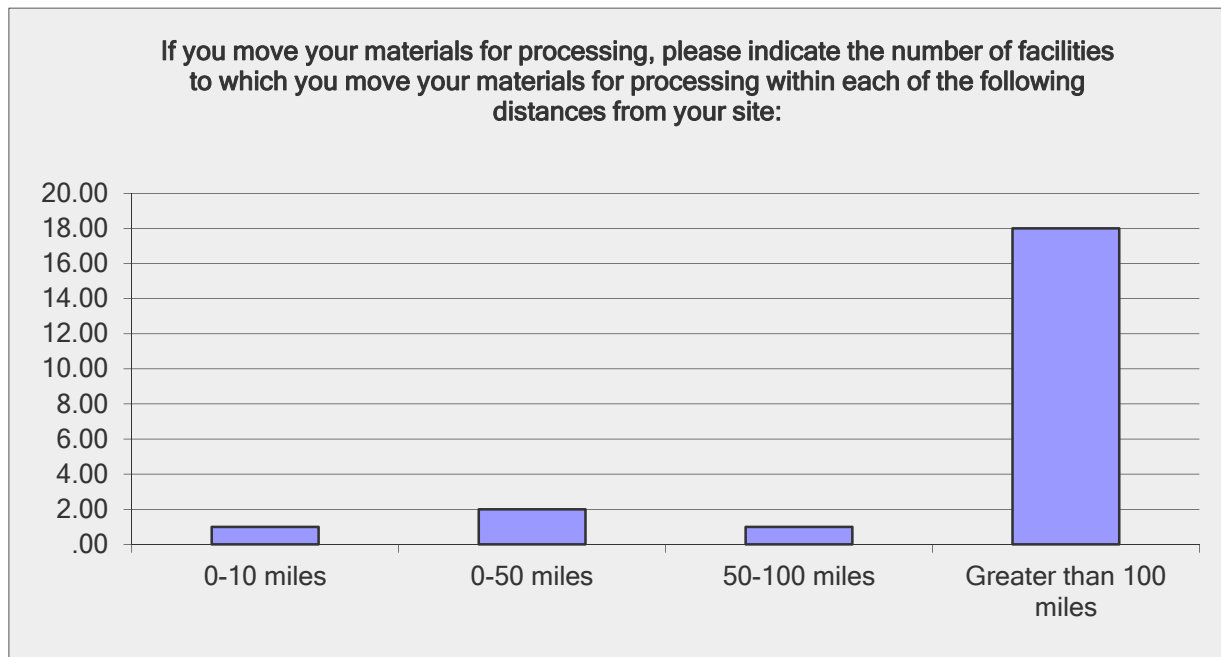


- 0-10 miles
- 10-50 miles
- 50-100 miles
- Greater than 100 miles

## Economic Study of Recycling in Colorado-Other

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

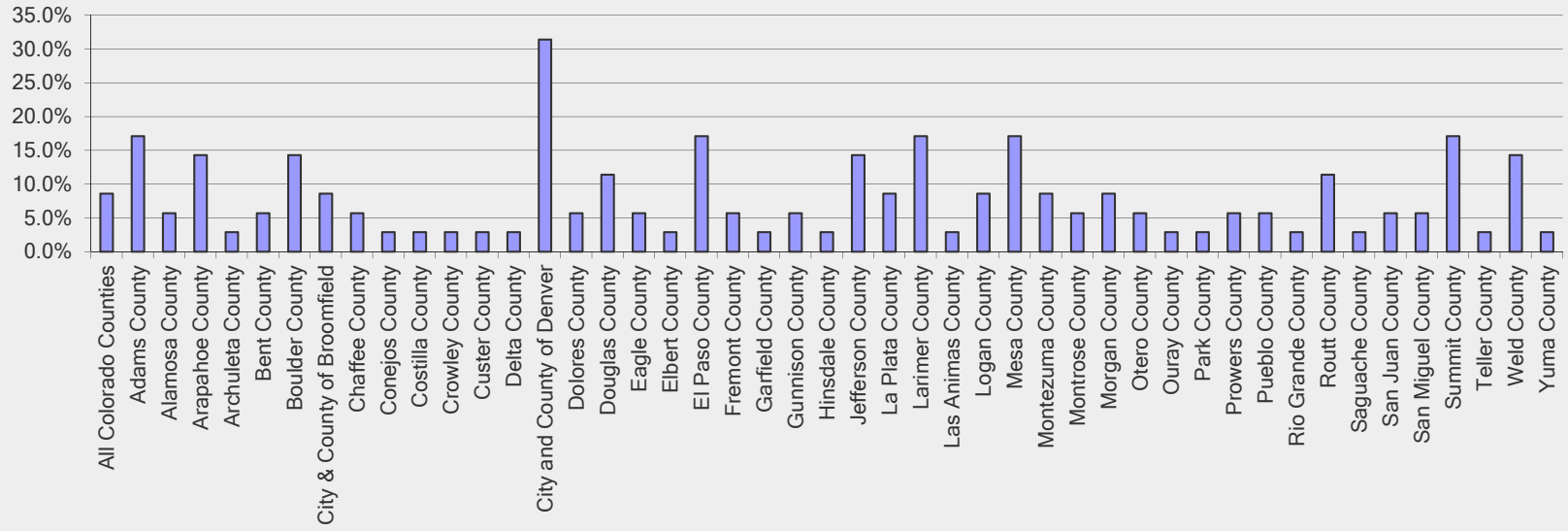
Answer Options	Response Average	Response Total	Response Count
0-10 miles	1.00	3	3
0-50 miles	2.00	4	2
50-100 miles	1.00	1	1
Greater than 100 miles	18.00	108	6
<i>answered question</i>			<b>8</b>
<i>skipped question</i>			<b>8</b>



## Economic Study of Recycling in Colorado-Processor

What county(ies) do you operate in (mark as many as apply)?		
Answer Options	Response Percent	Response Count
All Colorado Counties	8.6%	3
Adams County	17.1%	6
Alamosa County	5.7%	2
Arapahoe County	14.3%	5
Archuleta County	2.9%	1
Bent County	5.7%	2
Boulder County	14.3%	5
City & County of Broomfield	8.6%	3
Chaffee County	5.7%	2
Conejos County	2.9%	1
Costilla County	2.9%	1
Crowley County	2.9%	1
Custer County	2.9%	1
Delta County	2.9%	1
City and County of Denver	31.4%	11
Dolores County	5.7%	2
Douglas County	11.4%	4
Eagle County	5.7%	2
Elbert County	2.9%	1
El Paso County	17.1%	6
Fremont County	5.7%	2
Garfield County	2.9%	1
Gunnison County	5.7%	2
Hinsdale County	2.9%	1
Jefferson County	14.3%	5
La Plata County	8.6%	3
Larimer County	17.1%	6
Las Animas County	2.9%	1
Logan County	8.6%	3
Mesa County	17.1%	6
Montezuma County	8.6%	3
Montrose County	5.7%	2
Morgan County	8.6%	3
Otero County	5.7%	2
Ouray County	2.9%	1
Park County	2.9%	1
Prowers County	5.7%	2
Pueblo County	5.7%	2
Rio Grande County	2.9%	1
Routt County	11.4%	4
Saguache County	2.9%	1
San Juan County	5.7%	2
San Miguel County	5.7%	2
Summit County	17.1%	6
Teller County	2.9%	1
Weld County	14.3%	5
Yuma County	2.9%	1
	<i>answered question</i>	<b>35</b>
	<i>skipped question</i>	<b>1</b>

What county(ies) do you operate in (mark as many as apply)?

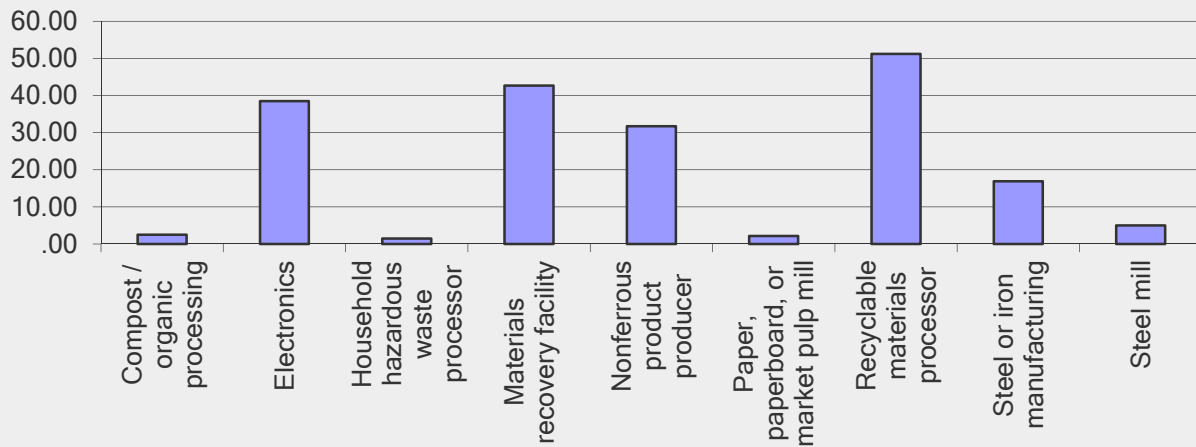


## Economic Study of Recycling in Colorado-Processor

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Compost / organic processing	2.50	20	8
Electronics	38.47	577	15
Household hazardous waste processor	1.43	10	7
Materials recovery facility	42.67	640	15
Nonferrous product producer	31.70	317	10
Paper, paperboard, or market pulp mill	2.14	15	7
Recyclable materials processor	51.20	512	10
Steel or iron manufacturing	16.88	135	8
Steel mill	5.00	25	5
<i>answered question</i>			<b>26</b>
<i>skipped question</i>			<b>10</b>

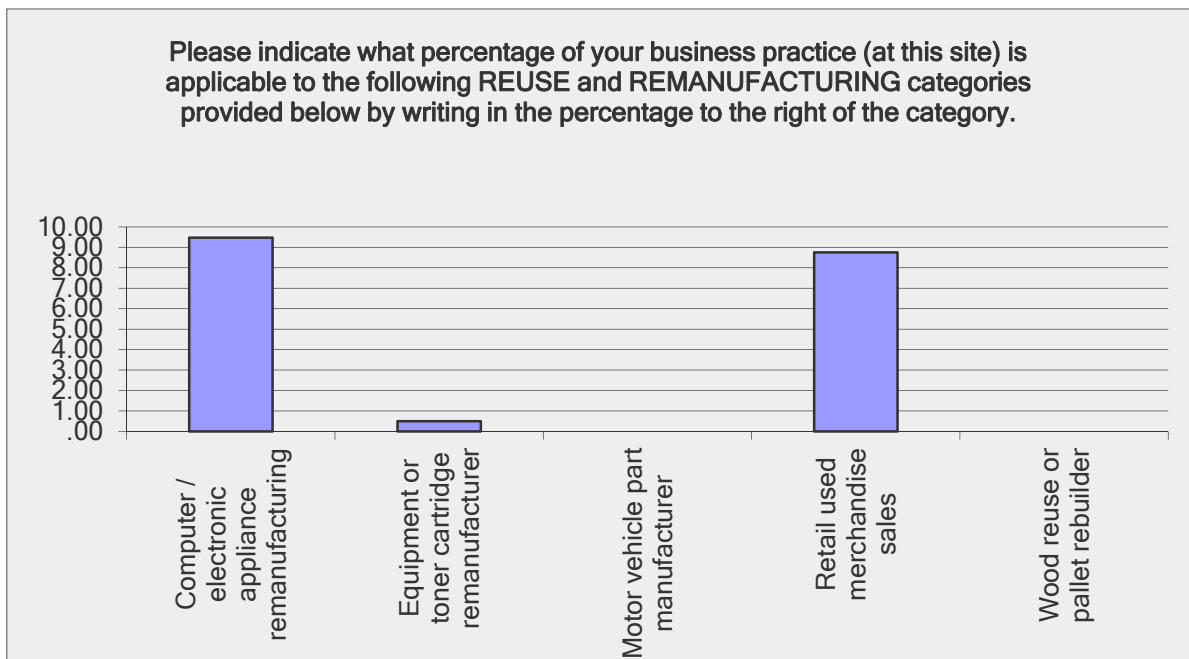
Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.



## Economic Study of Recycling in Colorado-Processor

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	9.47	142	15
Equipment or toner cartridge remanufacturer	.50	5	10
Motor vehicle part manufacturer	.00		10
Retail used merchandise sales	8.75	105	12
Wood reuse or pallet rebuilder	.00		9
<i>answered question</i>			<b>16</b>
<i>skipped question</i>			<b>20</b>



### Economic Study of Recycling in Colorado-Processor

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	65.91	2,109	32
		<i>answered question</i>	<b>32</b>
		<i>skipped question</i>	<b>4</b>

### Economic Study of Recycling in Colorado-Processor

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	24.24	703	29
		<i>answered question</i>	<b>29</b>
		<i>skipped question</i>	<b>7</b>

### Economic Study of Recycling in Colorado-Processor

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	11.00	297	27
		<i>answered question</i>	<b>27</b>
		<i>skipped question</i>	<b>9</b>

### Economic Study of Recycling in Colorado-Processor

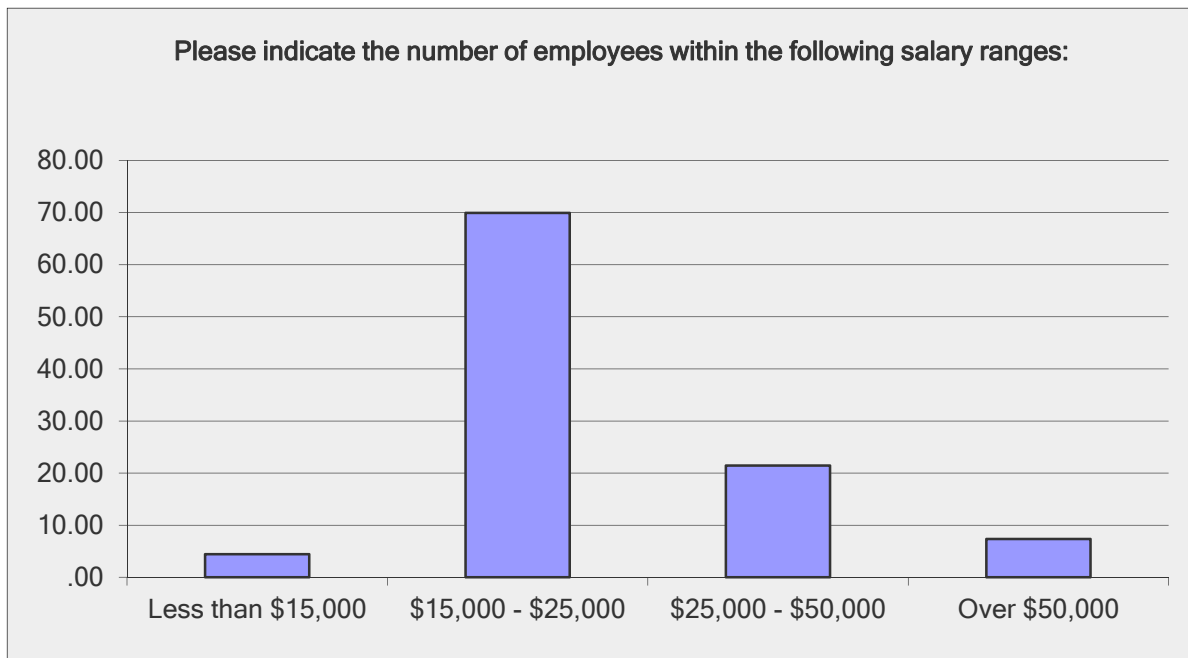
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	1,896,728.95	41,728,037	22
		<i>answered question</i>	<b>22</b>
		<i>skipped question</i>	<b>14</b>

## Economic Study of Recycling in Colorado-Processor

Please indicate the number of employees within the following salary ranges:

Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	4.43	62	14
\$15,000 - \$25,000	69.94	1,119	16
\$25,000 - \$50,000	21.46	558	26
Over \$50,000	7.35	147	20
<i>answered question</i>			<b>29</b>
<i>skipped question</i>			<b>7</b>

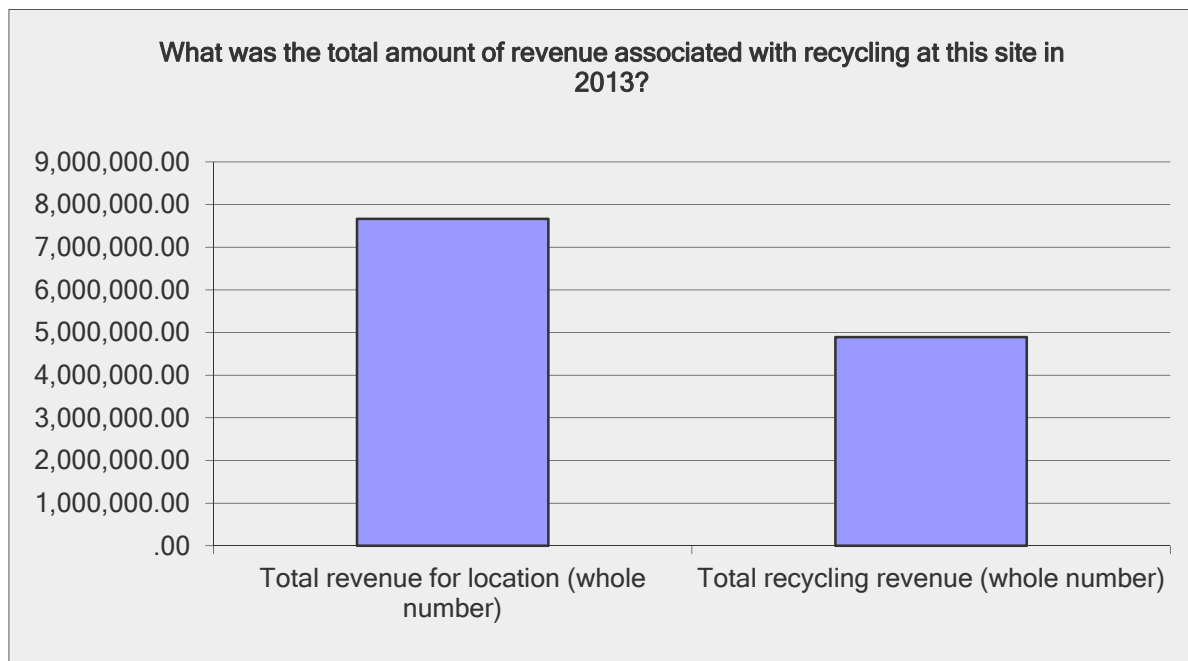




## Economic Study of Recycling in Colorado-Processor

What was the total amount of revenue associated with recycling at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	7,664,283.74	145,621,391	19
Total recycling revenue (whole number)	4,890,318.21	92,916,046	19
<i>answered question</i>			<b>20</b>
<i>skipped question</i>			<b>16</b>

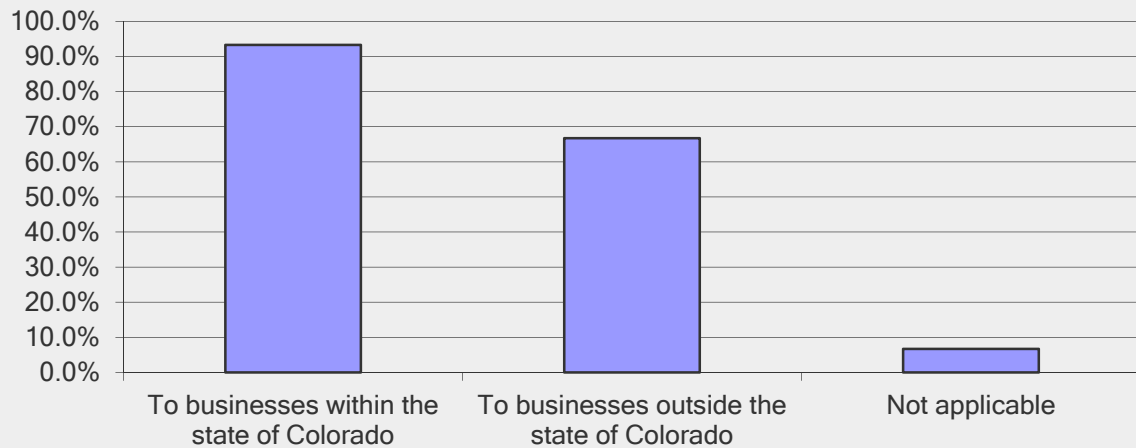


## Economic Study of Recycling in Colorado-Processor

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	93.3%	28
To businesses outside the state of Colorado	66.7%	20
Not applicable	6.7%	2
Comment:		14
<i>answered question</i>		<b>30</b>
<i>skipped question</i>		<b>6</b>

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

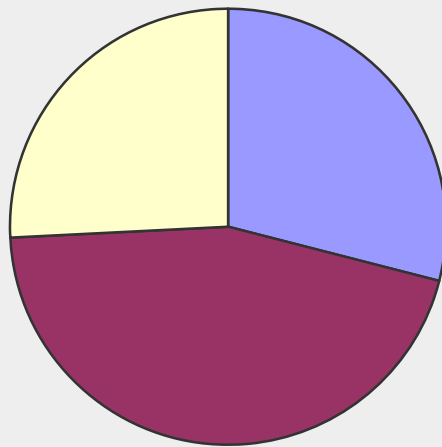


## Economic Study of Recycling in Colorado-Processor

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	29.0%	9
No	45.2%	14
Not applicable	25.8%	8
<i>answered question</i>		<b>31</b>
<i>skipped question</i>		<b>5</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?



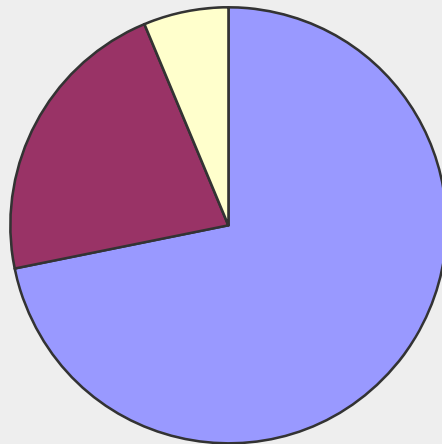
■ Yes  
■ No  
■ Not applicable

## Economic Study of Recycling in Colorado-Processor

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	71.9%	23
No	21.9%	7
Not applicable	6.3%	2
<i>answered question</i>		<b>32</b>
<i>skipped question</i>		<b>4</b>

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?



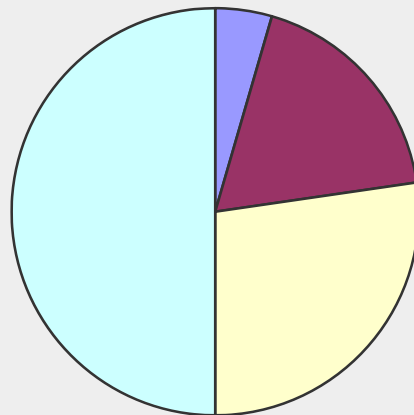
■ Yes  
■ No  
■ Not applicable

## Economic Study of Recycling in Colorado-Processor

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	4.5%	1
10-50 miles	18.2%	4
50-100 miles	27.3%	6
Greater than 100 miles	50.0%	11
<i>answered question</i>		<b>22</b>
<i>skipped question</i>		<b>14</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

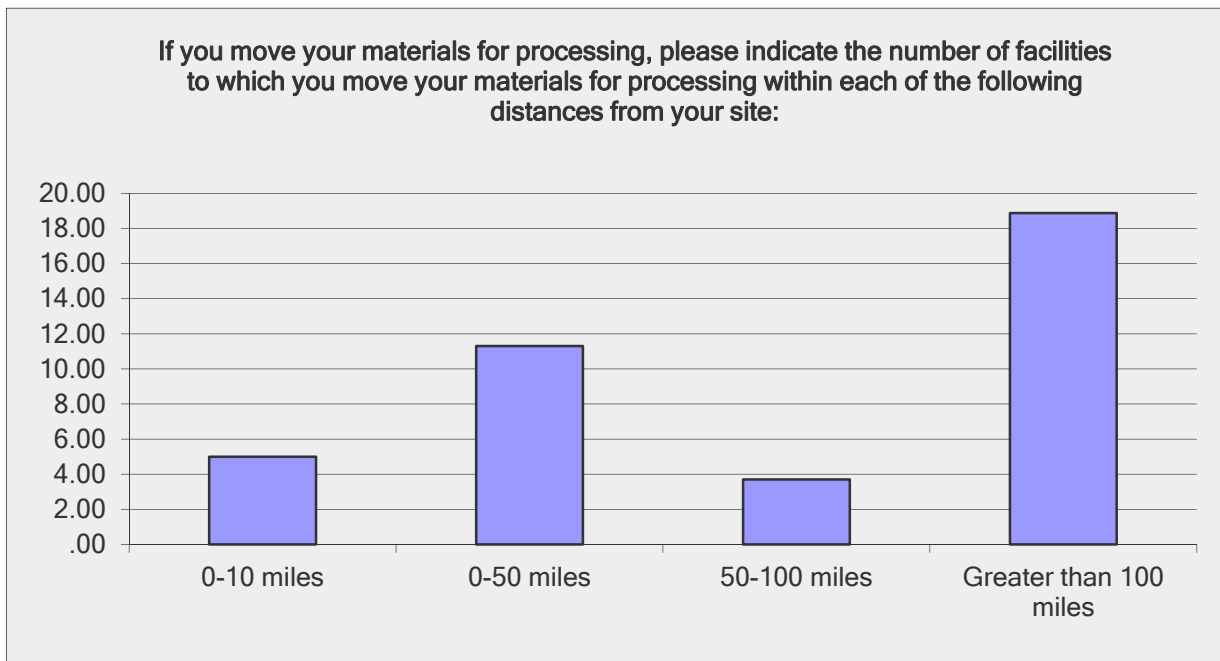


- 0-10 miles
- 10-50 miles
- 50-100 miles
- Greater than 100 miles

## Economic Study of Recycling in Colorado-Processor

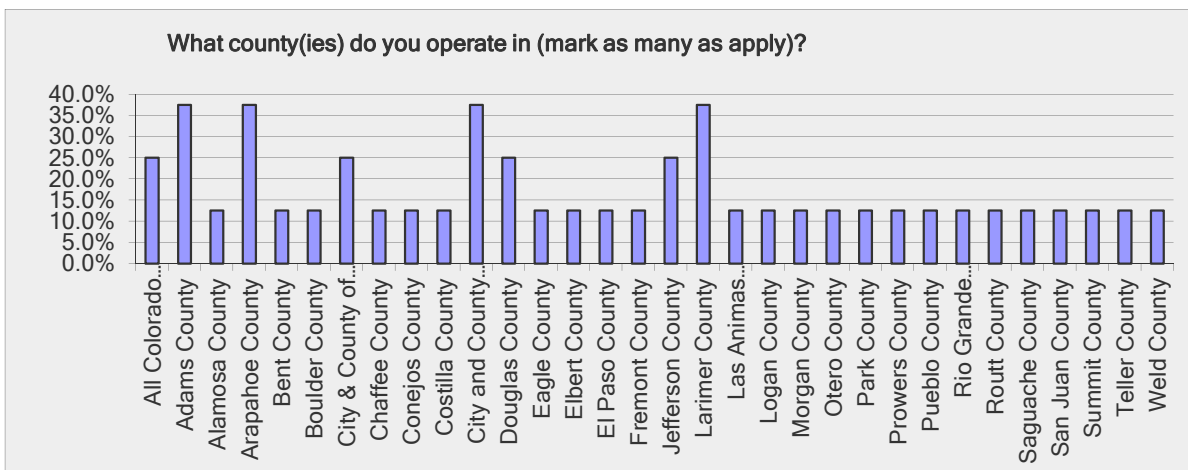
If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

Answer Options	Response Average	Response Total	Response Count
0-10 miles	5.00	55	11
0-50 miles	11.30	113	10
50-100 miles	3.70	37	10
Greater than 100 miles	18.88	302	16
<i>answered question</i>			<b>19</b>
<i>skipped question</i>			<b>17</b>



## Economic Study of Recycling in Colorado-Remanufacturer

What county(ies) do you operate in (mark as many as apply)?		
Answer Options	Response Percent	Response Count
All Colorado Counties	25.0%	2
Adams County	37.5%	3
Alamosa County	12.5%	1
Arapahoe County	37.5%	3
Bent County	12.5%	1
Boulder County	12.5%	1
City & County of Broomfield	25.0%	2
Chaffee County	12.5%	1
Conejos County	12.5%	1
Costilla County	12.5%	1
City and County of Denver	37.5%	3
Douglas County	25.0%	2
Eagle County	12.5%	1
Elbert County	12.5%	1
El Paso County	12.5%	1
Fremont County	12.5%	1
Jefferson County	25.0%	2
Larimer County	37.5%	3
Las Animas County	12.5%	1
Logan County	12.5%	1
Morgan County	12.5%	1
Otero County	12.5%	1
Park County	12.5%	1
Prowers County	12.5%	1
Pueblo County	12.5%	1
Rio Grande County	12.5%	1
Routt County	12.5%	1
Saguache County	12.5%	1
San Juan County	12.5%	1
Summit County	12.5%	1
Teller County	12.5%	1
Weld County	12.5%	1
<b>answered question</b>		<b>8</b>
<b>skipped question</b>		<b>0</b>

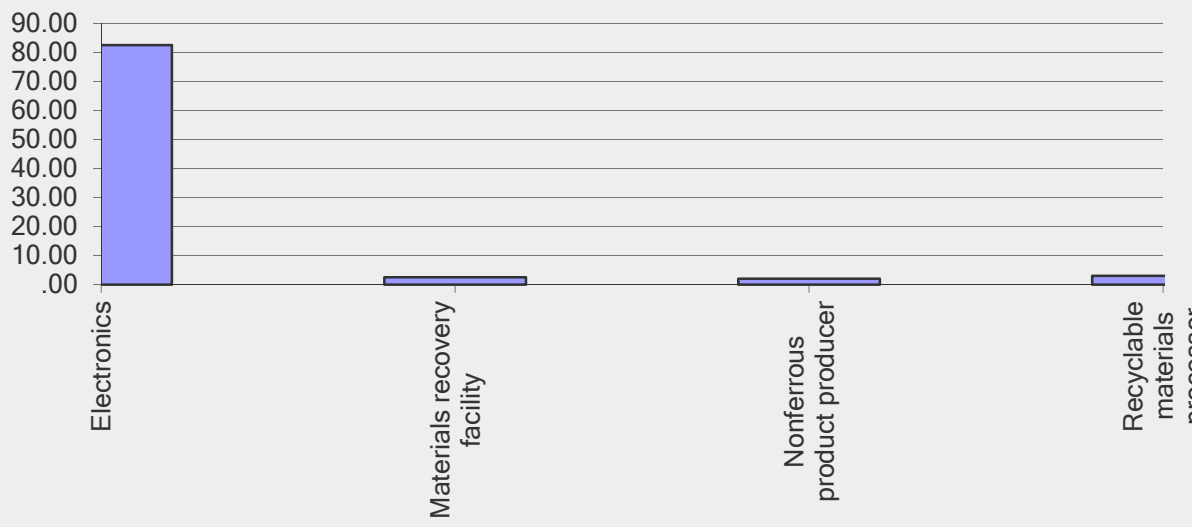


## Economic Study of Recycling in Colorado-Remanufacturer

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Electronics	82.50	330	4
Materials recovery facility	2.50	5	2
Nonferrous product producer	2.00	2	1
Recyclable materials processor	3.00	3	1
<i>answered question</i>			<b>4</b>
<i>skipped question</i>			<b>4</b>

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

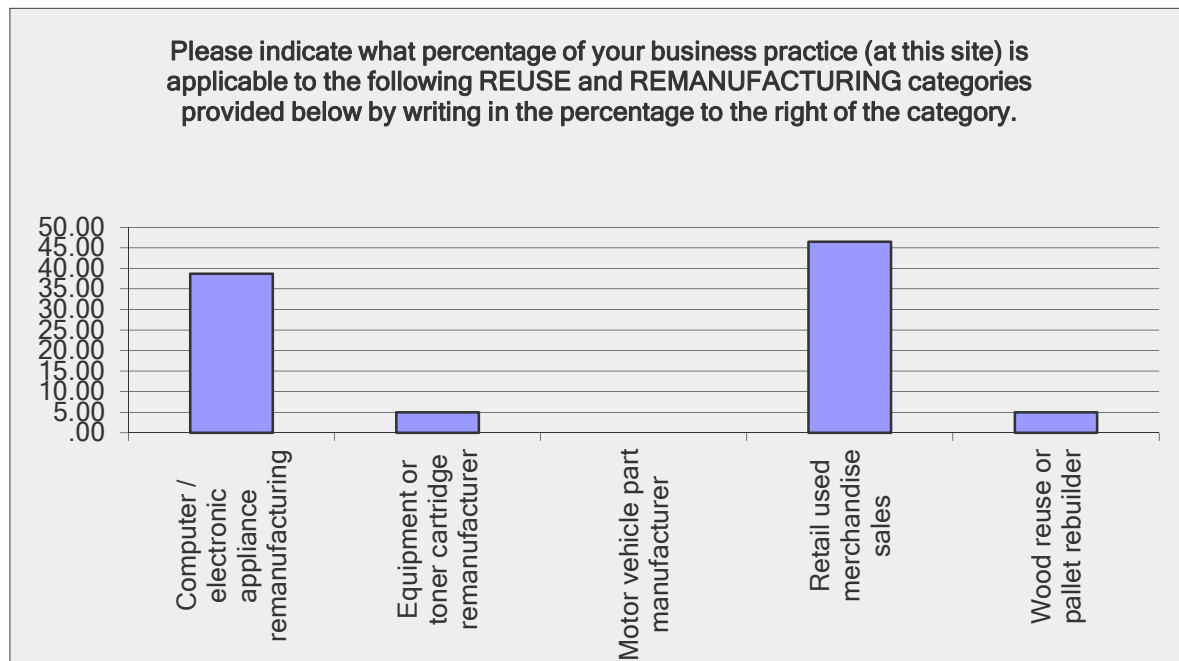




## Economic Study of Recycling in Colorado-Remanufacturer

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	38.67	232	6
Equipment or toner cartridge remanufacturer	5.00	5	1
Motor vehicle part manufacturer	.00		1
Retail used merchandise sales	46.50	93	2
Wood reuse or pallet rebuilder	5.00	10	2
<i>answered question</i>			<b>7</b>
<i>skipped question</i>			<b>1</b>



### Economic Study of Recycling in Colorado-Remanufacturer

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	205.88	1,647	8
		<i>answered question</i>	<b>8</b>
		<i>skipped question</i>	<b>0</b>

### Economic Study of Recycling in Colorado-Remanufacturer

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	78.75	630	8
		<i>answered question</i>	<b>8</b>
		<i>skipped question</i>	<b>0</b>

### Economic Study of Recycling in Colorado-Remanufacturer

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	16.29	114	7
		<i>answered question</i>	<b>7</b>
		<i>skipped question</i>	<b>1</b>

### Economic Study of Recycling in Colorado-Remanufacturer

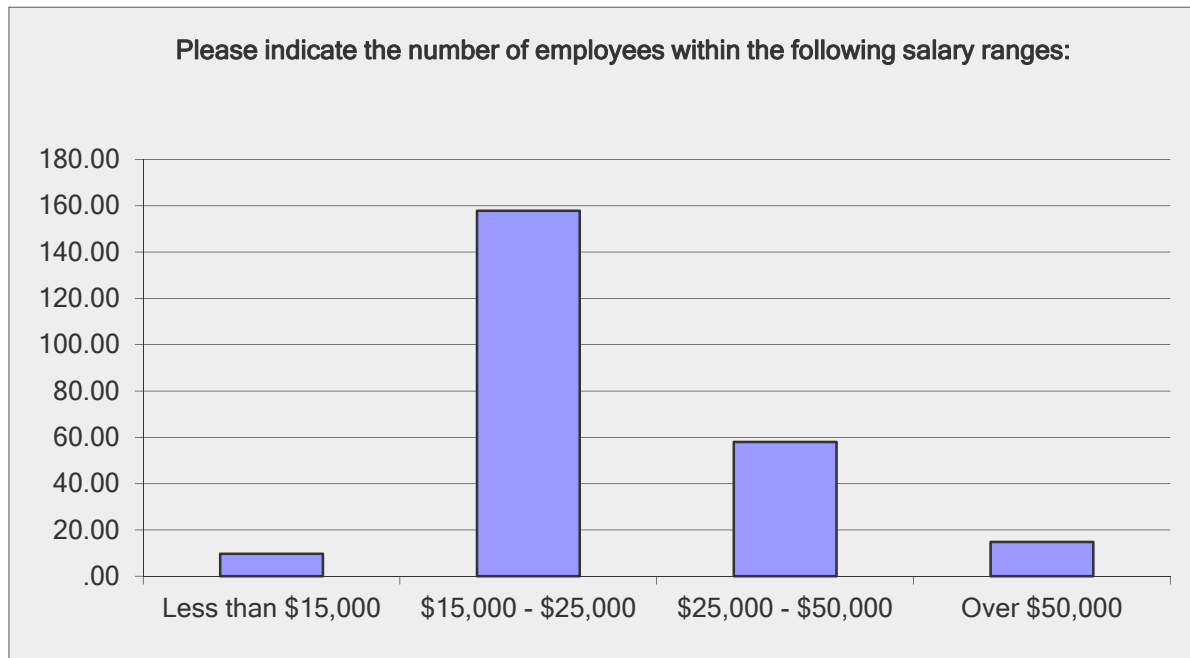
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	5,490,167.00	32,941,002	6
		<i>answered question</i>	<b>6</b>
		<i>skipped question</i>	<b>2</b>

## Economic Study of Recycling in Colorado-Remanufacturer

Please indicate the number of employees within the following salary ranges:

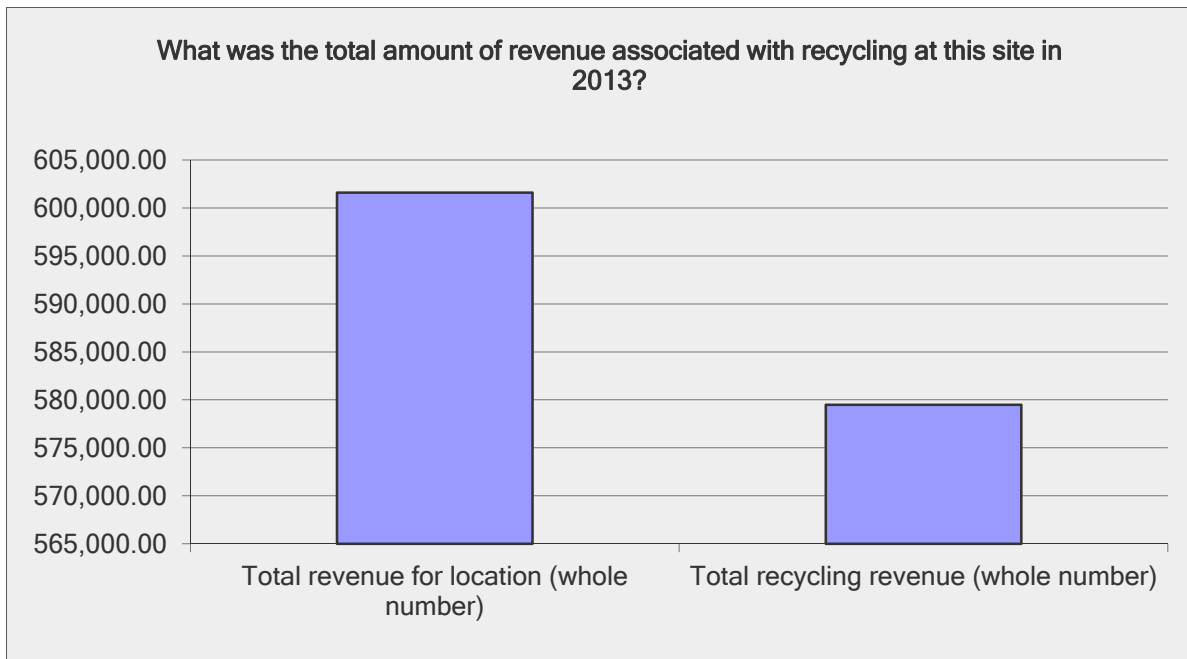
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	9.67	58	6
\$15,000 - \$25,000	157.86	1,105	7
\$25,000 - \$50,000	58.00	348	6
Over \$50,000	14.83	89	6
<i>answered question</i>			<b>8</b>
<i>skipped question</i>			<b>0</b>



## Economic Study of Recycling in Colorado-Remanufacturer

What was the total amount of revenue associated with recycling at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	601,595.00	3,007,975	5
Total recycling revenue (whole number)	579,488.20	2,897,441	5
<i>answered question</i>			<b>5</b>
<i>skipped question</i>			<b>3</b>

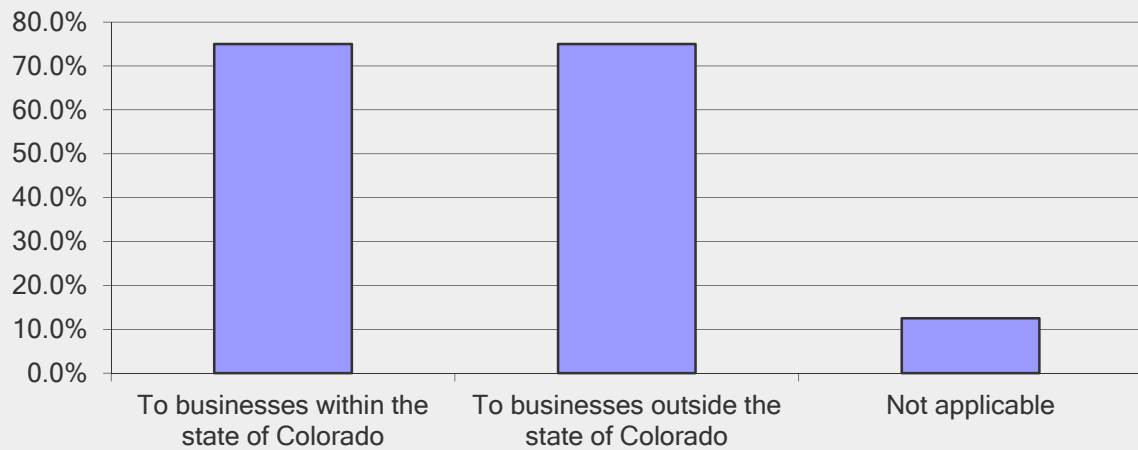


## Economic Study of Recycling in Colorado-Remanufacturer

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	75.0%	6
To businesses outside the state of Colorado	75.0%	6
Not applicable	12.5%	1
Comment:		4
<i>answered question</i>		<b>8</b>
<i>skipped question</i>		<b>0</b>

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

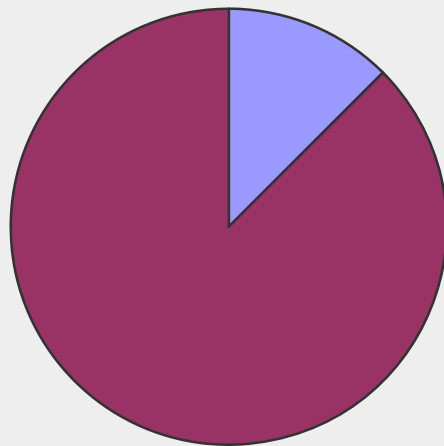


## Economic Study of Recycling in Colorado-Remanufacturer

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	12.5%	1
No	87.5%	7
<i>answered question</i>		<b>8</b>
<i>skipped question</i>		<b>0</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?



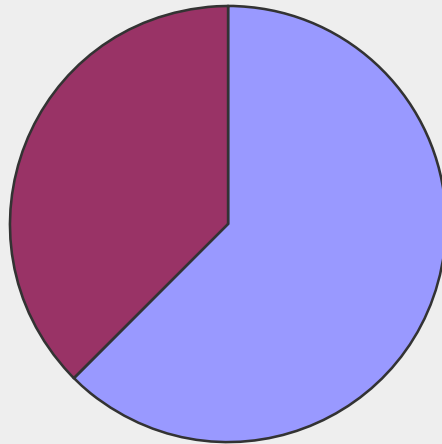
■ Yes ■ No

## Economic Study of Recycling in Colorado-Remanufacturer

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	62.5%	5
No	37.5%	3
<i>answered question</i>		<b>8</b>
<i>skipped question</i>		<b>0</b>

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?



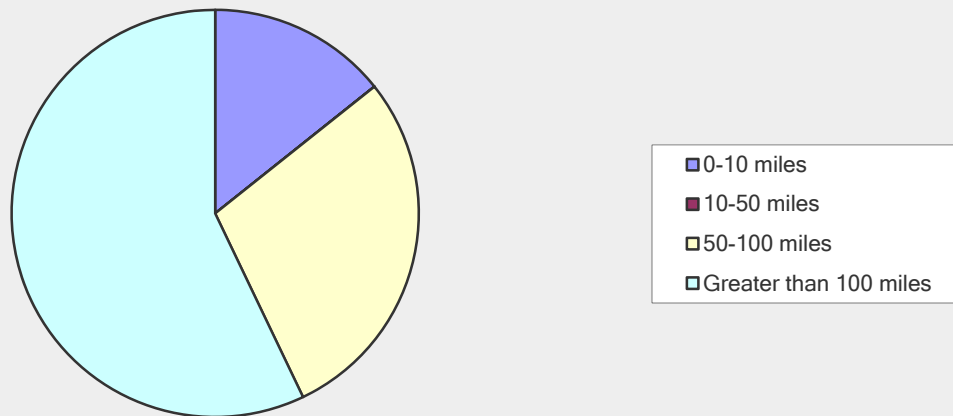
■ Yes ■ No

## Economic Study of Recycling in Colorado-Remanufacturer

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	14.3%	1
10-50 miles	0.0%	0
50-100 miles	28.6%	2
Greater than 100 miles	57.1%	4
<i>answered question</i>		<b>7</b>
<i>skipped question</i>		<b>1</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

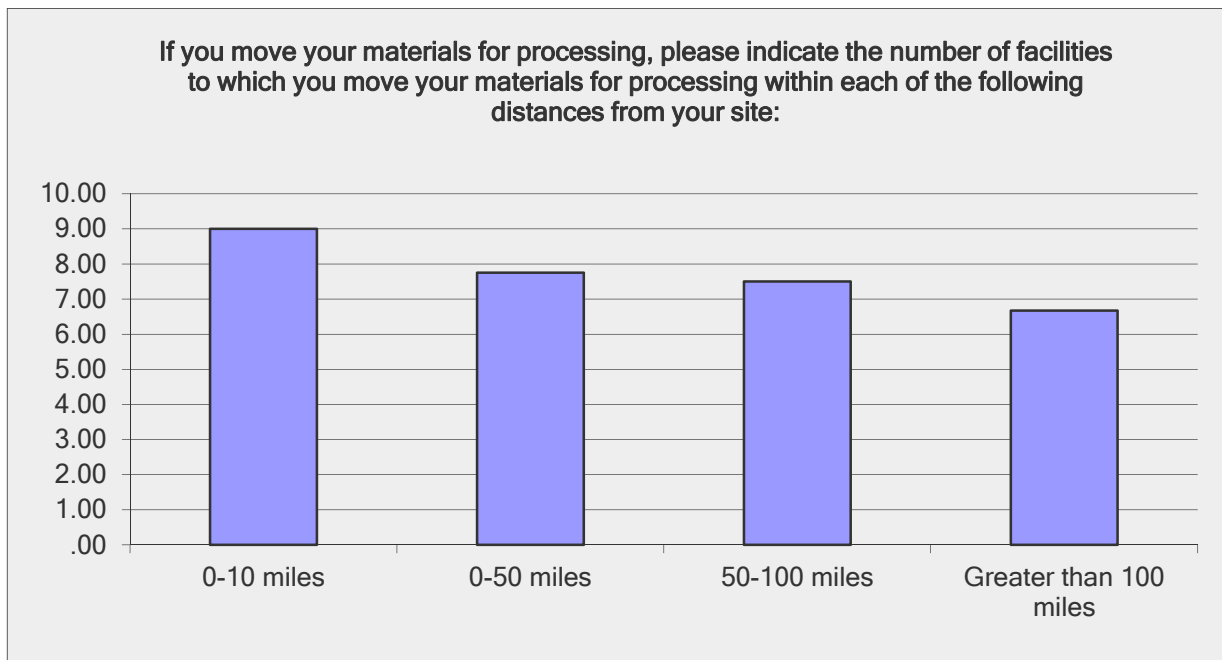




## Economic Study of Recycling in Colorado-Remanufacturer

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

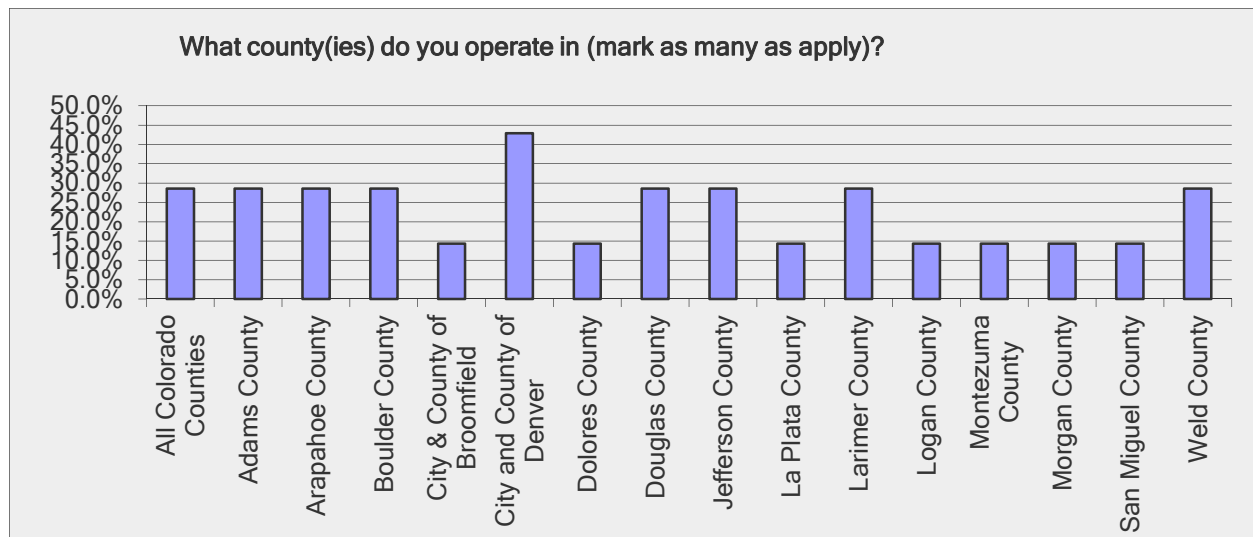
Answer Options	Response Average	Response Total	Response Count
0-10 miles	9.00	27	3
0-50 miles	7.75	31	4
50-100 miles	7.50	30	4
Greater than 100 miles	6.67	40	6
<i>answered question</i>			<b>6</b>
<i>skipped question</i>			<b>2</b>



## Economic Study of Recycling in Colorado-Reuser

What county(ies) do you operate in (mark as many as apply)?

Answer Options	Response Percent	Response Count
All Colorado Counties	28.6%	2
Adams County	28.6%	2
Arapahoe County	28.6%	2
Boulder County	28.6%	2
City & County of Broomfield	14.3%	1
City and County of Denver	42.9%	3
Dolores County	14.3%	1
Douglas County	28.6%	2
Jefferson County	28.6%	2
La Plata County	14.3%	1
Larimer County	28.6%	2
Logan County	14.3%	1
Montezuma County	14.3%	1
Morgan County	14.3%	1
San Miguel County	14.3%	1
Weld County	28.6%	2
<i>answered question</i>		<b>7</b>
<i>skipped question</i>		<b>0</b>

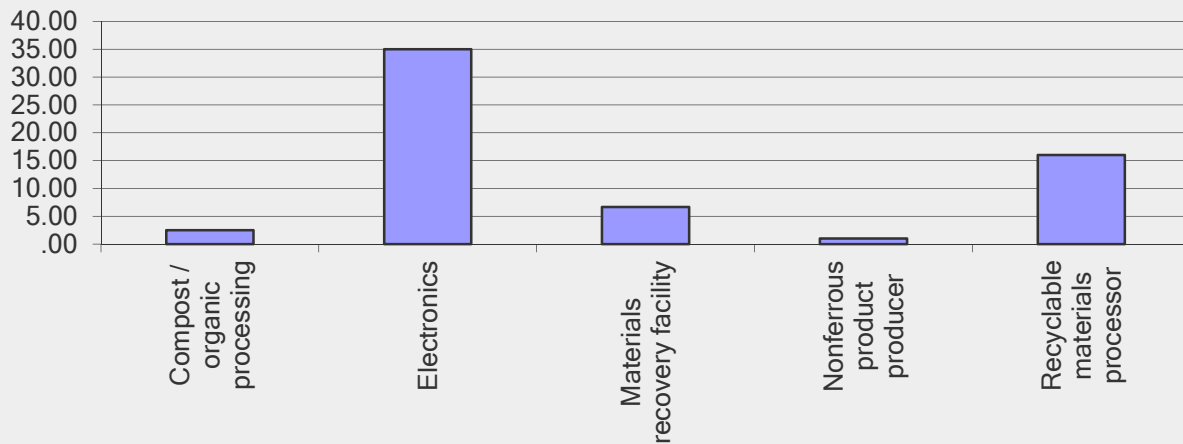


## Economic Study of Recycling in Colorado-Reuser

Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count	
Compost / organic processing	2.50	5	2	
Electronics	35.00	105	3	
Materials recovery facility	6.67	20	3	
Nonferrous product producer	1.00	2	2	
Recyclable materials processor	16.00	48	3	
			<i>answered question</i>	<b>3</b>
			<i>skipped question</i>	<b>4</b>

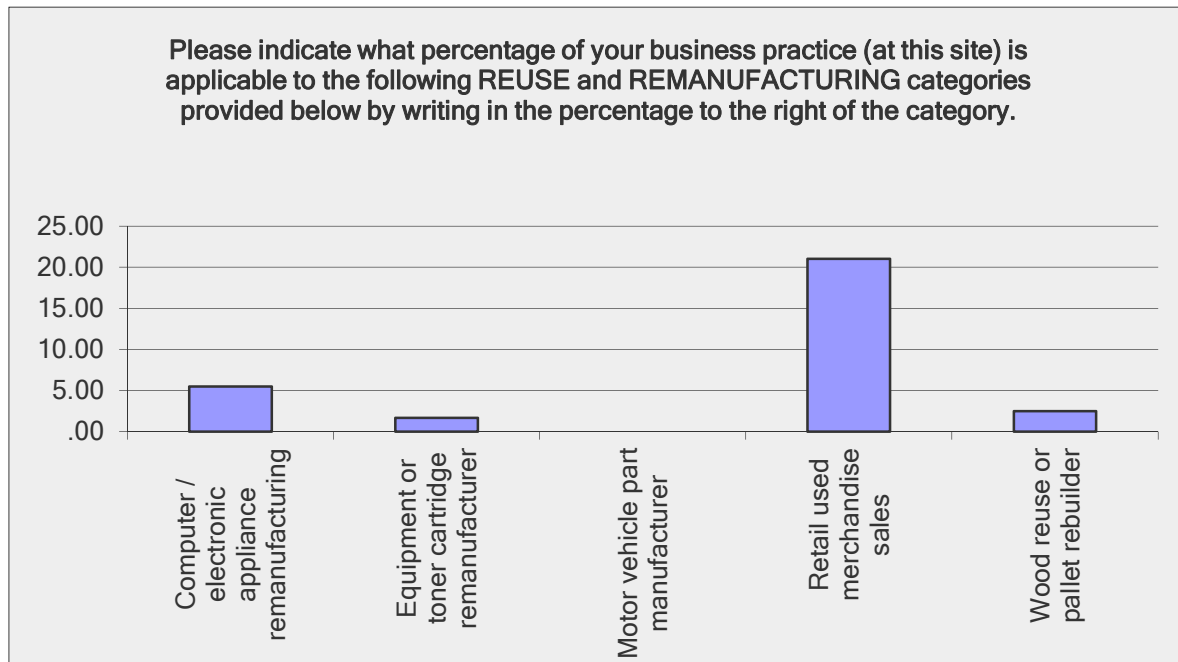
Please indicate what percentage of your business practice (at this site) is applicable to the following RECYCLING PROCESSING and MANUFACTURING categories provided below by writing in the percentage to the right of the category.



## Economic Study of Recycling in Colorado-Reuser

Please indicate what percentage of your business practice (at this site) is applicable to the following REUSE and REMANUFACTURING categories provided below by writing in the percentage to the right of the category.

Answer Options	Response Average	Response Total	Response Count
Computer / electronic appliance remanufacturing	5.50	22	4
Equipment or toner cartridge remanufacturer	1.67	5	3
Motor vehicle part manufacturer	.00		3
Retail used merchandise sales	21.00	105	5
Wood reuse or pallet rebuilder	2.50	10	4
<i>answered question</i>			<b>6</b>
<i>skipped question</i>			<b>1</b>



### Economic Study of Recycling in Colorado-Reuser

Please provide the number of FULL TIME employees (working 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Full Time Employees (whole number)	210.71	1,475	7
		<i>answered question</i>	7
		<i>skipped question</i>	0

### Economic Study of Recycling in Colorado-Reuser

Please provide the number of PART TIME employees (working less than 40 hours per week) at this site in 2013.

Answer Options	Response Average	Response Total	Response Count
Total Part Time Employees for location (whole number)	86.57	606	7
		<i>answered question</i>	7
		<i>skipped question</i>	0

### Economic Study of Recycling in Colorado-Reuser

What was the average number of hours PART TIME employees worked per week in 2013?

Answer Options	Response Average	Response Total	Response Count
Average number of hours for location (whole number)	14.50	87	6
		<i>answered question</i>	6
		<i>skipped question</i>	1

### Economic Study of Recycling in Colorado-Reuser

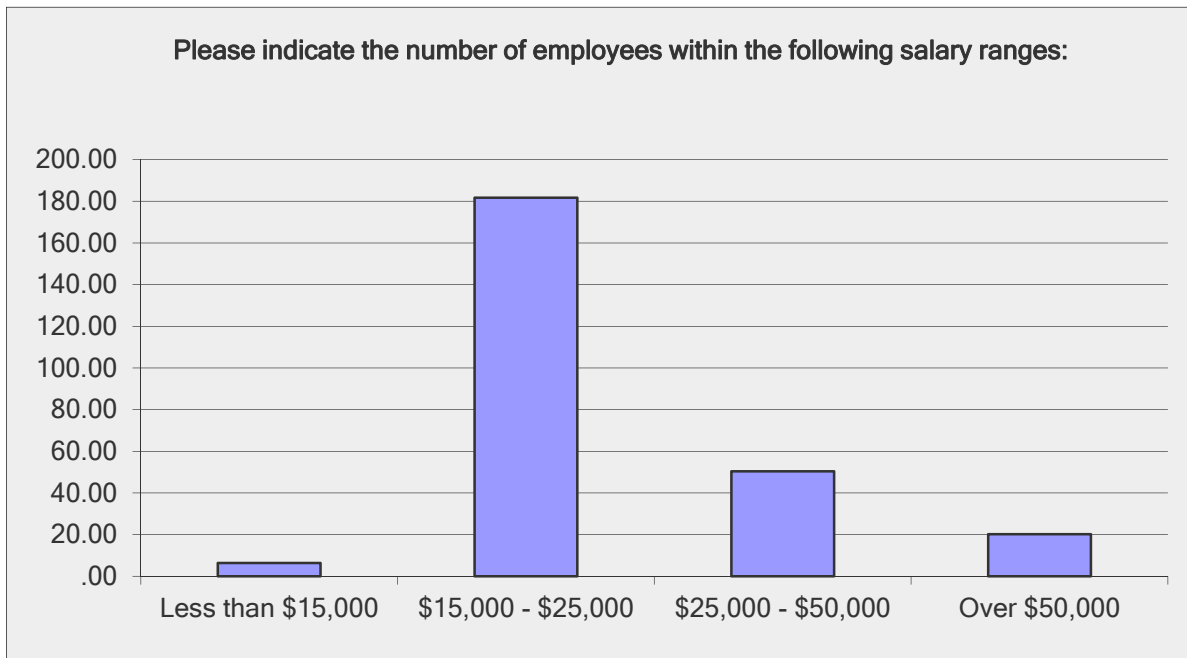
What was the total payroll associated at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total Annual Payroll for location (whole number)	6,307,060.80	31,535,304	5
		<i>answered question</i>	5
		<i>skipped question</i>	2

## Economic Study of Recycling in Colorado-Reuser

Please indicate the number of employees within the following salary ranges:

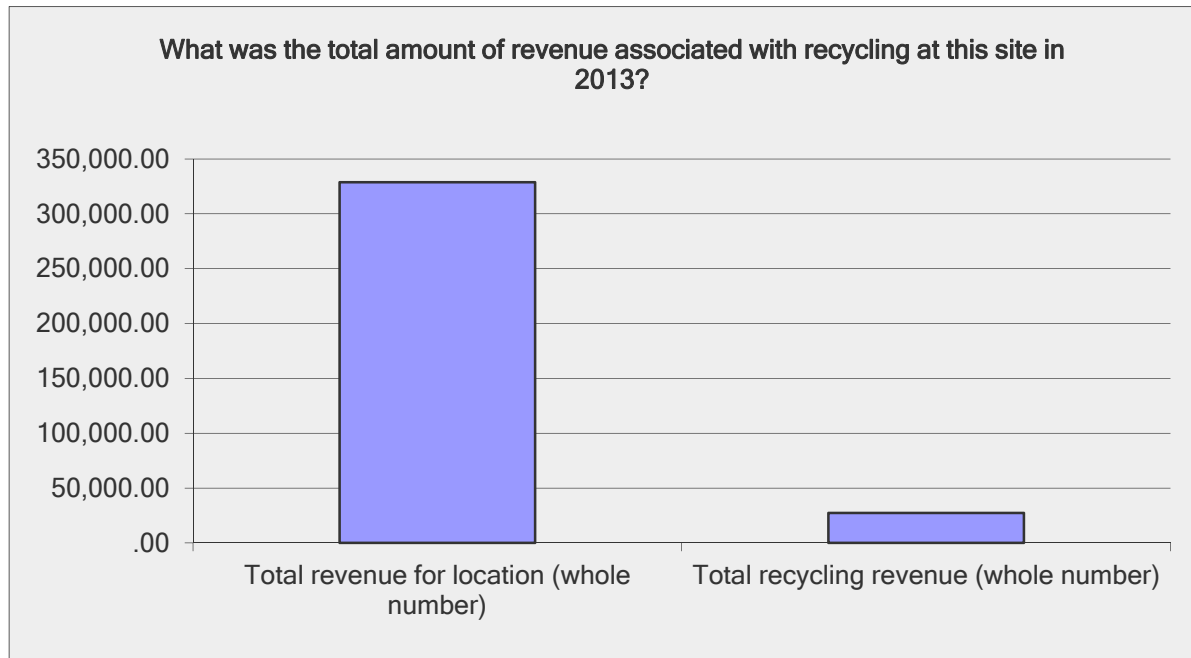
Answer Options	Response Average	Response Total	Response Count
Less than \$15,000	6.40	32	5
\$15,000 - \$25,000	181.67	1,090	6
\$25,000 - \$50,000	50.40	252	5
Over \$50,000	20.25	81	4
<i>answered question</i>			<b>7</b>
<i>skipped question</i>			<b>0</b>



## Economic Study of Recycling in Colorado-Reuser

What was the total amount of revenue associated with recycling at this site in 2013?

Answer Options	Response Average	Response Total	Response Count
Total revenue for location (whole number)	328,779.75	1,315,119	4
Total recycling revenue (whole number)	27,337.75	109,351	4
<i>answered question</i>			<b>4</b>
<i>skipped question</i>			<b>3</b>

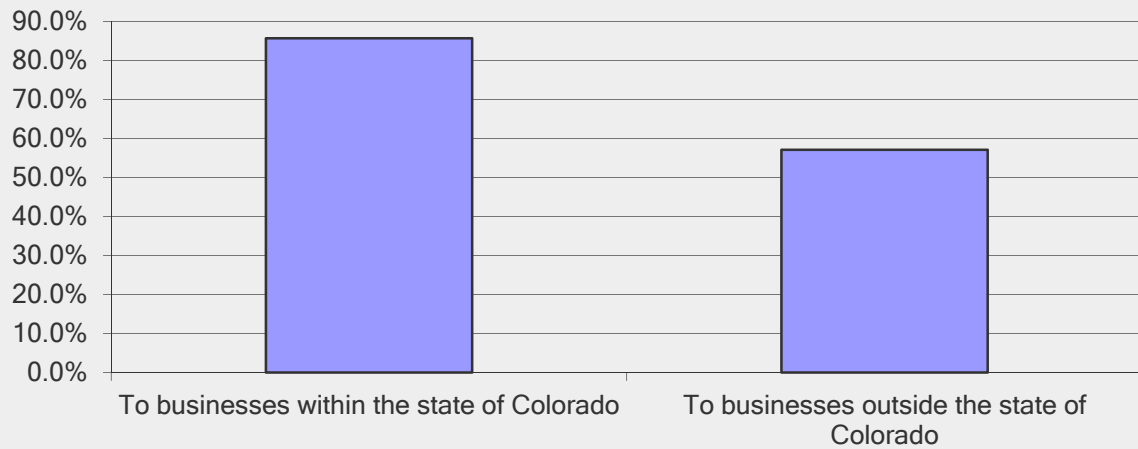


## Economic Study of Recycling in Colorado-Reuser

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.

Answer Options	Response Percent	Response Count
To businesses within the state of Colorado	85.7%	6
To businesses outside the state of Colorado	57.1%	4
Comment:		3
<i>answered question</i>		<b>7</b>
<i>skipped question</i>		<b>0</b>

Please indicate where your recycling-related products are sold (mark all that apply). If recycling-related products are sold out of state please explain in the comment box.



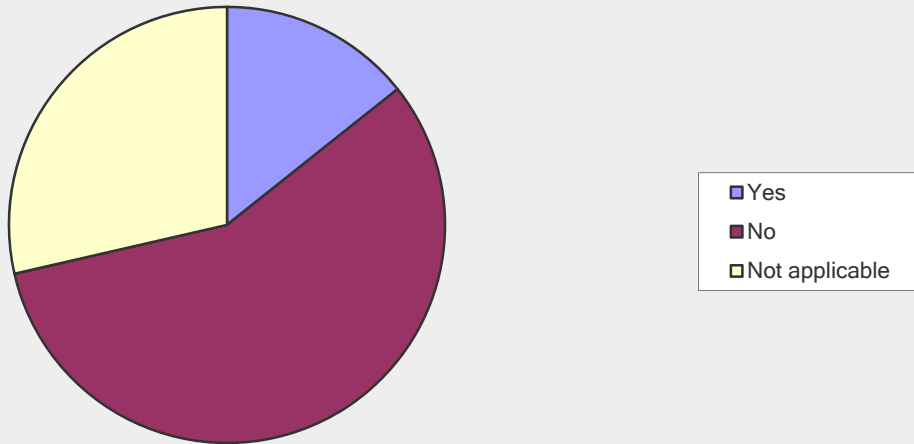


## Economic Study of Recycling in Colorado-Reuser

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

Answer Options	Response Percent	Response Count
Yes	14.3%	1
No	57.1%	4
Not applicable	28.6%	2
<i>answered question</i>		<b>7</b>
<i>skipped question</i>		<b>0</b>

Do you partner with local Colorado manufacturers to use recycled materials for their manufacturing needs?

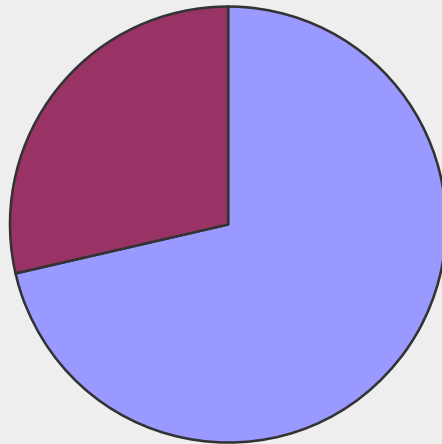


## Economic Study of Recycling in Colorado-Reuser

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?

Answer Options	Response Percent	Response Count
Yes	71.4%	5
No	28.6%	2
<i>answered question</i>		7
<i>skipped question</i>		0

Do you have knowledge of, or believe that there is a demand for your recycled materials within the state of Colorado?



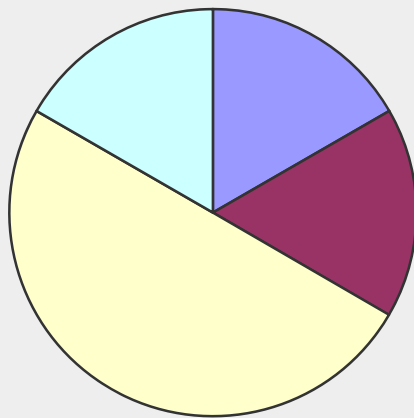
■ Yes ■ No

## Economic Study of Recycling in Colorado-Reuser

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:

Answer Options	Response Percent	Response Count
0-10 miles	16.7%	1
10-50 miles	16.7%	1
50-100 miles	50.0%	3
Greater than 100 miles	16.7%	1
<i>answered question</i>		<b>6</b>
<i>skipped question</i>		<b>1</b>

If you collect materials related to your recycling activities, please indicate the approximate radius of distance within which you collect your materials:



■ 0-10 miles  
■ 10-50 miles  
■ 50-100 miles  
■ Greater than 100 miles

## Economic Study of Recycling in Colorado-Reuser

If you move your materials for processing, please indicate the number of facilities to which you move your materials for processing within each of the following distances from your site:

Answer Options	Response Average	Response Total	Response Count
0-10 miles	1.00	3	3
0-50 miles	2.00	6	3
50-100 miles	2.00	4	2
Greater than 100 miles	5.33	16	3
<i>answered question</i>			<b>3</b>
<i>skipped question</i>			<b>4</b>

