



Management  
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- **Minnesota Pollution Control Agency**

# **A Study of the Economic Activity of Minnesota's Reuse, Repair and Rental Sectors**

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# Executive Summary

For this study's purpose, the reuse sector encompasses three activities: used product sales, repairs, and rental services. Reusing materials and products, salvaging and refurbishing materials, extending a product's life through repair, or renting products may reduce virgin-material demand and solid waste in cases when they replace or delay the need for new items. This study examines the economics associated with reuse by:

- Estimating the reuse, repair and rental sectors' employment numbers and economic activity; and
- Describing whether consumer spending on reuse activities results in more or less overall local spending.

Minnesota's reuse sector directly employs almost 46,000 people and generates at least \$4 billion in gross sales annually, or 1.8 percent of employed people and 1.6 percent of the state's gross domestic product. For comparison, the tourism sector has 238,000 employees and \$11 billion in sales. Automotive-related industries represent 75 percent of the reuse sector's gross sales and 60 percent of employees. The top five industries are:

- General automotive repair: 6,520 employees.
- New car dealers (used sales & repairs only): 6,070 employees.
- Automotive body, paint, & interior repair: 5,560 employees.
- Used merchandise stores: 2,930 employees.
- Other automotive mechanical & electrical repair: 2,240 employees.

Most reuse firms have one to two employees and represent a small portion of economic activity while the largest firms account for the majority of reuse jobs and sales. Regional metropolitan areas' reuse-sector employees and sales are generally in proportion to the population. Many counties' reuse employment positively correlates with jobs generally.

Limited academic research exists on the economics of reuse, but five interviewed experts agreed that reuse activities keep money local. They stated that the economic impact increases with the value added within Minnesota, but is relatively small for used items. The experts also noted that buying used does not change people's spending habits or how money circulates, and they described the difficulty in estimating statewide economic impacts because of multiple possibilities.

The reuse sector pays approximately \$1 billion in wages annually and an estimated \$159 million in state business, individual income and sales taxes. The 46,000 direct reuse jobs generate another 4,600 jobs in supporting industries. Reuse sector employees' personal spending supports 8,300 jobs in unrelated industries.

The state's three largest thrift store operations generate \$53 million in annual sales and divert at least 11,000 tons from landfills. They reported 154,000 annual volunteer hours, which equates to \$1.1 million to \$1.5 million depending on the value of a volunteer hour.

# Introduction

The Minnesota Pollution Control Agency (MPCA) commissioned this study to better understand the economics associated with reuse, the solid-waste management hierarchy's second tier. The hierarchy indicates best management strategies for solid waste in order of best to worst: reduce, reuse, recycle, incineration, landfill. The study's purpose was to:

- Estimate the reuse sector's employment numbers and economic activity in Minnesota's economy; and
- Describe whether consumer dollars spent in the reuse sector result in more or less overall local spending.

## Scope

This study presents readily-available economic information on business activities that extend the useful life of consumer goods and:

- Assesses the economic activity of Minnesota's reuse sector and not the environmental aspects.
- Defines the reuse sector more broadly than in national and other states' studies by including repairs, which extend a product's useful life, and rentals, which are an alternative to purchasing new items.
- Excludes recycling, online sales activities, and person-to-person sales, rentals and repairs.
- Excludes economic rebound effects associated reuse. That is, if people buy more material goods because a dollar goes further when spent in the reuse sector.
- Relies primarily upon 2009 business activity data, with no time-series data.

## Method

MPCA staff developed the project goals and study questions, then contracted with Management Analysis & Development (MAD) to collect and analyze the data and write this report. MPCA and MAD staff frequently discussed data and methodological issues when key decisions were required.

The overall method was to:

- Define the reuse sector to identify industries for inclusion.
- Obtain the selected industries' most recent employment and sales data.
- Adjust the data as necessary to isolate reuse activities included in larger functions.
- Estimate these industries' economic activity with the REMI Policy Insight 2 region-economic modeling software.
- Interview local economists and review literature to qualitatively describe how consumers' reuse-sector spending affects Minnesota's economy.

## **Data source and adjustments**

Management Analysis & Development purchased a dataset with the selected reuse industries from Dun & Bradstreet's Government Solutions division on June 8, 2011. Dun & Bradstreet acquires and supplements the Minnesota Secretary of State's Business Filings list with NAICS codes and employment and sales data.

MPCA and Management Analysis staff considered the Dun & Bradstreet data to be the most current and complete. The data included sole proprietors and 2009 sales and employee counts, and Dun & Bradstreet staff had reviewed 89 percent of the records within the last six months. This dataset also listed each firm so miscoded ones and outliers could be excluded.

However, Dun & Bradstreet estimated 28 percent of the firms' employee numbers and 75 percent of sales "based on defined norms for the industry and size of business." The dataset excludes chain stores' sales data, so underestimates sales by an unknown amount for small reuse industries dominated by large chain stores, such as pawn shops and thrift stores.

Management Analysis excluded firms that did not fit the reuse definition or had no Minnesota employees. Management Analysis also applied percentages to eight industries' total sales and employees to estimate only the reuse components. The reuse percentages are based on industry-specific sources and telephone calls to a small number of Minnesota businesses. All data are rounded to the nearest \$100,000 for sales and nearest 10 for employees. Appendix A documents the data sources, specific adjustments and quantitative methods for future replication.

## Description of the Reuse Sector

This section describes the type, number and size of businesses engaged in reuse activities. To decide which industries to include, MPCA defined reuse as:

- When the first owner of an item sells or gives the item to another person or entity, or donates the item to charity or community groups.
- Salvaging and refurbishing materials to extend their life and reduce the overall first costs of constructing materials and products.
- Extending a product's life through repair so it can be used longer and replace the need for a new item.

MPCA's definition is broader than a National Recycling Coalition study's, which excluded repair services and explained that reuse businesses "recover products or components that were *disposal-bound* and sell them back into the stream of commerce [emphasis added]." <sup>1</sup> However, other organizations consider repair a part of reuse. <sup>2</sup>

Reuse is not recycling, which alters an object's physical form by extracting base materials for processing into a new item. A reused object maintains its original or similar purpose without significant alteration.

Reuse activities may reduce virgin material demand and the related impacts of extracting and processing virgin materials, depending on the consumer's actions. Influencing factors include whether the reused item is a substitute for an equivalent new item or if reuse savings are spent on other new, virgin-material goods, perhaps negating the overall material conservation. However, such analysis is beyond this study's scope.

### Reuse industries

Industries meeting the MPCA's reuse definition were drawn from the North American Industry Classification System (NAICS), which federal and state governments and the private sector use to classify business establishments for statistical and other purposes (Table 1). Reuse industries without a specific NAICS code were excluded, such as pallet remanufacturers and material exchanges. <sup>3</sup>

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<sup>1</sup> National Recycling Coalition, "Frequently Asked Questions about the U.S. Recycling Economic Information Study," October 2001, page 1. <http://www.epa.gov/osw/conservation/rrr/rmd/rei-rw/pdf/faq.pdf>.

<sup>2</sup> See Appendix B for further explanation.

<sup>3</sup> These businesses are in larger NAICS codes. Other reuse studies survey these businesses for jobs data.



Table 1. Selected reuse industries

Used sales <sup>4</sup>	Rental	Repair
<ul style="list-style-type: none"> <li>• Boats</li> <li>• Cars &amp; trucks</li> <li>• General merchandise (any non-vehicle item)</li> <li>• Motor vehicle parts &amp; tires</li> <li>• Motorcycles</li> <li>• Pawned items</li> <li>• Recreational vehicles</li> <li>• Snowmobiles, all terrain vehicles, jet skis &amp; other off-road vehicles</li> <li>• Utility trailers</li> </ul>	<ul style="list-style-type: none"> <li>• Commercial machinery &amp; equipment</li> <li>• Consumer electronics, appliances &amp; other goods</li> <li>• Formal wear &amp; costumes</li> <li>• General rental centers</li> <li>• Home health equipment</li> <li>• Office machinery &amp; equipment</li> <li>• Recreational goods</li> <li>• Recreational vehicles</li> <li>• Video tapes &amp; discs</li> </ul>	<ul style="list-style-type: none"> <li>• Appliances</li> <li>• Automotive vehicles</li> <li>• Commercial machinery &amp; equipment</li> <li>• Communication equipment</li> <li>• Computer/office machines</li> <li>• Consumer electronics</li> <li>• Footwear &amp; leather goods</li> <li>• Furniture</li> <li>• Home/garden equipment</li> <li>• Electronic &amp; precision equipment</li> <li>• Personal &amp; household goods</li> </ul>

Note to Table 1: Appendix B describes the specific six-digit NAICS industries. Some industries' reuse activities are part of a larger function. For example, car dealerships sell both new and used vehicles and repair them. This list is not exhaustive; other industries provide reuse activities as a small portion of their output.

## Analysis

Minnesota's reuse sector directly employs almost 46,000 full-time<sup>5</sup> employees and generates at least \$4 billion in gross sales annually (Table 2). Used automotive sales, parts and repairs are almost half of the reuse sector's firms, three-quarters of the sales and 60 percent of the employees.

The top five industries by employment represent 43 percent of the reuse sector firms, 62 percent of sales and almost 50 percent of employment:

- General automotive repair: 6,520 employees.
- New car dealers (used sales & repairs only): 6,070 employees.
- Automotive body, paint, & interior repair: 5,560 employees.
- Used merchandise stores: 2,930 employees.
- Other automotive mechanical & electrical repair: 2,240 employees.

The sales and employee numbers likely underestimate the reuse sector's economic activity because the dataset excludes material reuse industries, part-time employees, person-to-person transactions, such as garage and online sales, and sales of privately owned businesses franchises of chain stores (though their full-time employees are counted).

<sup>4</sup> Remanufactured wholesale and used retail.

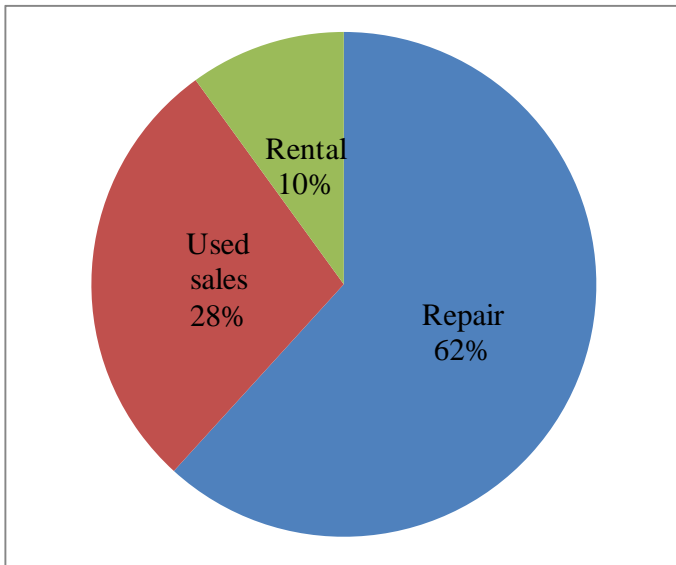
<sup>5</sup> The data excludes part-time employees.

Table 2. Minnesota reuse-sector firms, sales in millions, and full-time employees

NAICS code and industry	Firms	Sales (millions)	Full-time Employees
326212 Tire retreading <sup>†</sup>	6	\$5.4	100
423140 Used motor vehicle parts <sup>†</sup>	124	\$78.3	830
441110 New car dealers (used sales & repairs only) <sup>†</sup>	536	\$1,374.2	6,070
441120 Used car dealers (sales & repairs) <sup>†</sup>	666	\$305.6	1,980
441210 Recr. vehicle dealers (used sales & repairs only)	86	\$48.7	220
441221 Motorcycle dealers (used sales & repairs only)	182	\$41.1	270
441222 Boat dealers (used sales & repairs only)	222	\$28.8	220
441229 All oth. vehicle dealers (used sales & repairs only)	384	\$30.3	250
441320 Tire dealers (used sales & repairs only) <sup>†</sup>	365	\$23.7	500
453310 Used merchandise stores	1,072	\$92.6	2,930
522298 Pawn shops	80	\$2.6	80
532120 Recreational vehicle rental	15	\$3.3	50
532210 Consumer electronics & appliances rental	29	\$3.3	80
532220 Formal wear & costume rental	62	\$16.8	240
532230 Video tape & disc rental	283	\$29.3	1,470
532291 Home health equipment rental	29	\$6.9	200
532292 Recreational goods rental	60	\$10.2	280
532299 All other consumer goods rental	171	\$65.8	910
532310 General rental centers	12	\$38.2	150
532420 Office machinery & equipment rental	20	\$7.8	60
532490 Other machinery & equipment rental	403	\$57.4	1,140
811111 General automotive repair <sup>†</sup>	2,874	\$441.6	6,520
811112 Automotive exhaust system repair <sup>†</sup>	119	\$20.4	450
811113 Automotive transmission repair <sup>†</sup>	144	\$33.8	500
811118 Other automotive mech. & elec. repair <sup>†</sup>	735	\$146.7	2,240
811121 Automotive body, paint, & interior repair <sup>†</sup>	1,389	\$401.9	5,560
811122 Automotive glass replacement shops <sup>†</sup>	226	\$37.5	740
811198 All other automotive repair <sup>†</sup>	307	\$66.3	2,170
811211 Consumer electronics repair	145	\$21.6	350
811212 Computer & office machine repair	272	\$49.5	770
811213 Communication equipment repair	22	\$3.8	70
811219 Other electronic & precision equip. repair	667	\$126.2	2,000
811310 Commercial machinery repair	849	\$127.7	2,000
811411 Home & garden equipment repair	180	\$22.0	340
811412 Appliance repair	1,365	\$102.3	1,940
811420 Reupholstery & furniture repair	438	\$30.6	710
811430 Footwear & leather goods repair	78	\$5.8	140
811490 Other personal & household goods repair	743	\$64.9	1,310
<b>Reuse sector total</b>	<b>15,360</b>	<b>\$3,972.9</b>	<b>45,840</b>

Source: Dun & Bradstreet dataset dated June 8, 2011, with apportionment by Management Analysis for reuse activities. † indicates automotive-related industry. Sales are underestimated by an unknown amount because the dataset excludes sales for privately owned businesses and chain stores (but includes their employees). The dataset lists 617 firms with five or more employees with 7,610 employees but no sales data.

Figure 1. Employees by reuse activity



Seventy-one percent of reuse firms perform repair activities, and have almost two-thirds of employees (Table 3 and Figure 1), reflecting repair's labor intensive nature. Used sales are the second largest reuse activity by firm and employee count, but the largest by sales due to high-priced items, like vehicles. Rental activities contribute 10 percent of the reuse sector's employment and even smaller shares of sales and firms.

Source: Table 3.

Table 3. Number of firms, sales in millions, and employees by reuse activity

Activity	Firms	Percent	Sales	Percent	Employees	Percent
Repair	10,918	71%	\$1,726.3	43%	28,310	62%
Used sales	3,358	22%	\$2,007.6	51%	12,950	28%
Rental	1,084	7%	\$239.0	6%	4,580	10%
<b>Total</b>	<b>15,360</b>	<b>100%</b>	<b>\$3,972.9</b>	<b>100%</b>	<b>45,840</b>	<b>100%</b>

Source: Table 2. "Used sales" includes some repair activity. Appendix B – Table 20 lists each industry by repair, used sales or rental.

Almost 70 percent of reuse firms have one or two employees (Table 4 and Figure 2). Most single-employee firms are sole proprietorships, but some are branch locations. Less than a fifth of firms have five or more employees, but account for most of the reuse sector's employees and sales.

Table 4. Firm size, sales in millions and employees

Firm size	Firms	Percent	Sales	Percent	Employees	Percent
One employee	6,569	43%	\$373.0	9%	6,123	13%
Two	3,995	26%	\$402.3	10%	6,732	15%
Three	1,260	8%	\$239.5	6%	3,274	7%
Four	774	5%	\$198.5	5%	2,560	6%
Five or more	2,762	18%	\$2,759.6	70%	27,151	59%
<b>Total</b>	<b>15,360</b>	<b>100%</b>	<b>\$3,972.9</b>	<b>100%</b>	<b>45,840</b>	<b>100%</b>

Source: Dun & Bradstreet dataset dated June 8, 2011, with apportionment by Management Analysis for reuse activities. Total employees for firms with four or fewer employees is less than the number of firms times firm size due to apportioning some industries' employees for reuse activities. For example, the 6,569 one-employee firms have 6,123 reuse employees.

Figure 2. Total firms, sales and employees by firm size



### Centroid analysis

The MPCA assigns 17 counties into four high-population “centroids” – Duluth, Rochester, St. Cloud, and Twin Cities – that together generate 70 percent of Minnesota’s solid waste.<sup>6</sup> Reuse jobs and sales are almost proportional to each centroid’s population, though the type of reuse firms may differ among the centroids (Table 5 and Figure 3).<sup>7</sup> Non-centroid Greater Minnesota counties (“all other counties”) have more but smaller reuse firms than the Twin Cities Centroid, reflecting lower population densities.

Table 5. Reuse sector by geographic area

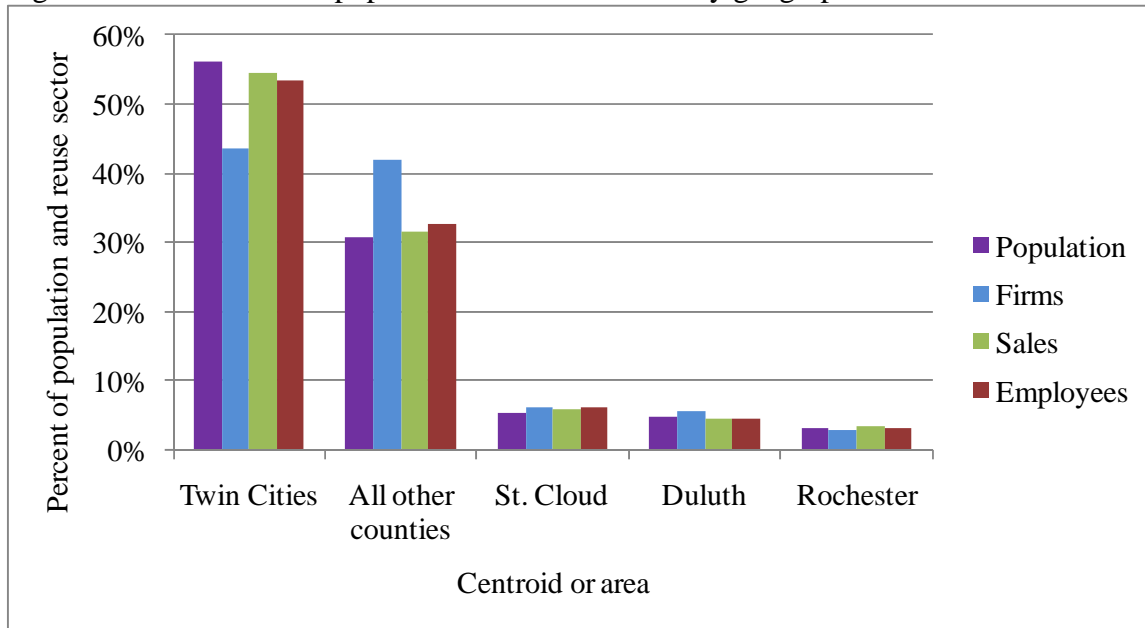
Centroid or area	Popu- lation	Firms	Percent	Sales	Percent	Employ- ees	Percent
Twin Cities	56%	6,683	43%	\$2,164.4	54%	24,460	53%
All other counties	31%	6,421	42%	\$1,250.7	31%	14,980	33%
St. Cloud	5%	956	6%	\$237.8	6%	2,830	6%
Duluth	5%	847	6%	\$180.7	5%	2,080	5%
Rochester	3%	453	3%	\$139.3	4%	1,490	3%
<b>Total</b>	<b>100%</b>	<b>15,360</b>	<b>100%</b>	<b>\$3,972.9</b>	<b>100%</b>	<b>45,840</b>	<b>100%</b>

Source: Dun & Bradstreet dataset dated June 8, 2011, with apportionment by Management Analysis for reuse activities. Sales are in millions. Population percentages are based on 5,303,925 people (2010 Census).

<sup>6</sup> Minnesota Pollution Control Agency, *2009 Solid Waste Policy Report*, February 2010, page 3. <http://www.pca.state.mn.us/index.php/view-document.html?gid=3911>. Twin Cities centroid: Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, Washington, and Wright counties. St. Cloud centroid: Benton, Sherburne, and Stearns counties. Duluth centroid: Carlton, Cook, Lake, and St. Louis counties, and the Western Lake Superior Sanitary District. Rochester centroid: Dodge and Olmsted counties.

<sup>7</sup> Most of the sales data is estimated on employee count, so a high correlation is expected.

Figure 3. Percent of state population and reuse sector by geographic area



### County analysis

Nine reuse employees exist per 1,000 people statewide, with county ratios ranging from 14 to 4 per 1,000 (Table 6). The 10 largest counties' ratios are close to the statewide ratio, with the exception of Stearns County's 11 employees per 1,000 (large regional center) and Washington County's seven employees per 1,000 (bedroom communities). No pattern exists between most counties' population size and the reuse employees-to-population ratio (Figure 4).

Table 6. Ratio of reuse employees per 1,000 people (sorted by highest ratio)

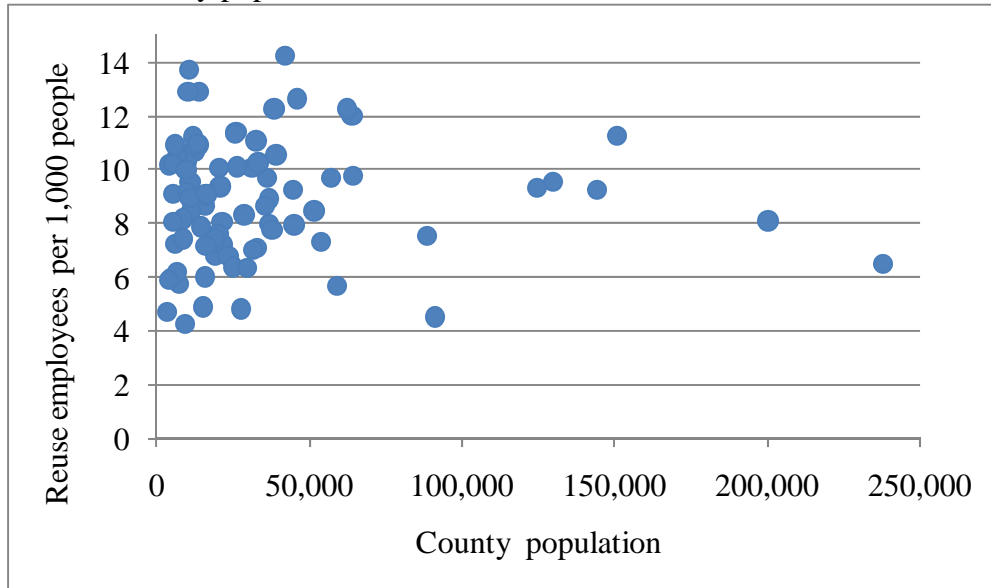
County	Employees	Population	Ratio	County	Employees	Population	Ratio
Kandiyohi	601	42,239	14.2	Steele	326	36,576	8.9
Yellow Medicine	143	10,438	13.7	Dakota	3,516	398,552	8.8
Pennington	180	13,930	12.9	Roseau	136	15,629	8.7
Jackson	132	10,266	12.9	Carlton	306	35,386	8.7
Goodhue	583	46,183	12.6	Watonwan	95	11,211	8.5
Crow Wing	767	62,500	12.3	Winona	436	51,461	8.5
Benton	472	38,451	12.3	Cass	238	28,567	8.3
Blue Earth	768	64,013	12.0	Murray	71	8,725	8.2
Brown	296	25,893	11.4	Ramsey	4,157	508,640	8.2
Lyon	293	25,857	11.3	Hennepin	9,361	1,152,425	8.1
Stearns	1,693	150,642	11.2	St. Louis	1,622	200,226	8.1
Cottonwood	131	11,687	11.2	Mahnomen	44	5,413	8.1
Becker	360	32,504	11.1	Nobles	172	21,378	8.0
Koochiching	146	13,311	11.0	McLeod	293	36,651	8.0

Table continued on next page.

County	Employees	Population	Ratio	County	Employees	Population	Ratio
Lincoln	64	5,896	10.9	Itasca	358	45,058	7.9
Wadena	151	13,843	10.9	Faribault	114	14,553	7.9
Chippewa	133	12,441	10.7	Isanti	293	37,816	7.7
Stevens	103	9,726	10.6	Dodge	153	20,087	7.6
Mower	413	39,163	10.6	Sherburne	665	88,499	7.5
Wilkin	69	6,576	10.5	Houston	141	19,027	7.4
Pipestone	99	9,596	10.3	Clearwater	65	8,695	7.4
Morrison	341	33,198	10.3	Chisago	395	53,887	7.3
Big Stone	54	5,269	10.2	Grant	44	6,018	7.3
Lake of the Woods	41	4,045	10.2	Wabasha	156	21,676	7.2
Mille Lacs	264	26,097	10.1	Aitkin	116	16,202	7.2
Freeborn	314	31,255	10.1	Nicollet	232	32,727	7.1
Hubbard	205	20,428	10.1	Polk	222	31,600	7.0
Rock	97	9,687	10.0	Meeker	159	23,300	6.8
Rice	628	64,142	9.8	Waseca	130	19,136	6.8
Otter Tail	557	57,303	9.7	Washington	1,545	238,136	6.5
Douglas	348	36,009	9.7	Todd	159	24,895	6.4
Lake	104	10,866	9.6	Pine	189	29,750	6.4
Scott	1,238	129,928	9.5	Norman	42	6,852	6.2
Fillmore	196	20,866	9.4	Renville	94	15,730	6.0
Martin	195	20,840	9.4	Kittson	27	4,552	6.0
Wright	1,165	124,700	9.3	Red Lake	24	4,089	5.9
Anoka	3,069	330,844	9.3	Lac qui Parle	42	7,259	5.8
Olmsted	1,337	144,248	9.3	Clay	334	58,999	5.7
Beltrami	412	44,442	9.3	Sibley	74	15,226	4.9
Swift	90	9,783	9.2	Le Sueur	133	27,703	4.8
Kanabec	148	16,239	9.1	Traverse	17	3,558	4.7
Cook	47	5,176	9.1	Carver	411	91,042	4.5
Redwood	146	16,059	9.1	Marshall	40	9,439	4.3
Pope	98	10,995	8.9	<b>State</b>	<b>45,840</b>	<b>5,303,925</b>	<b>8.6</b>

Sources: Dun & Bradstreet dataset dated June 8, 2011, with apportionment by Management Analysis for reuse activities. Population is based on the 2010 Census.

Figure 4. No pattern is evident between the ratio of reuse employees to county population



Note: Due to scale issues, four counties over 250,000 people are excluded.

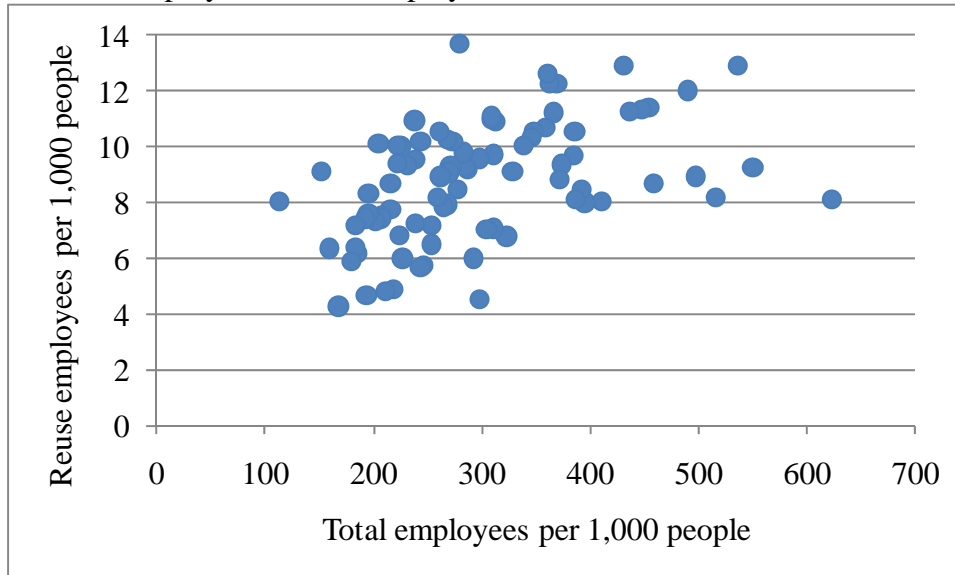
High-ratio Greater Minnesota counties have one or two large reuse companies or a company with multiple locations but the Dun & Bradstreet dataset only lists the main office with the company's total employees. Several high reuse-employee counties also have high total employees-to-population ratios, suggesting that a high reuse ratio is not a unique characteristic but related to the county's overall private-sector employment (Table 7 and Figure 5).

Table 7. Highest county ratios of total employees per 1,000 people

County	Table 6 ratio	Total employees	Population	Total ratio
Hennepin	8.1	717,861	1,152,425	623
Olmsted	9.3	79,342	144,248	550
Pennington	12.9	7,457	13,930	535
Ramsey	8.2	262,407	508,640	516
Steele	8.9	18,197	36,576	498
Blue Earth	12.0	31,331	64,013	489
Roseau	8.7	7,158	15,629	458
Brown	11.4	11,752	25,893	454
Lyon	11.3	11,580	25,857	448
Stearns	11.2	65,642	150,642	436
Kandiyohi	14.2	18,253	42,239	432
Jackson	12.9	4,420	10,266	431

Sources: Population is based on the 2010 Census. Total private-sector employees is from the Minnesota Department of Employment and Economic Development – 2010 Quarterly Census of Employment and Wages (annual data), which covers 97 percent of Minnesota employment. <http://www.positivelyminnesota.com/apps/lmi/qcew/AreaSel.aspx>.

Figure 5. A positive relationship is evident between counties' ratios of reuse employees to total employees



### Person-to-person sales and free exchanges

Dun & Bradstreet's sales data excludes person-to-person sales of used items, whether conducted online or through newspaper classifieds. An unscientific search of the Twin Cities' Craigslist, eBay Classifieds, Free Market and Freecycle web sites confirmed that Craigslist is the Twin Cities' dominate online-exchange, as it is nationally. The Twin Cities' Craigslist had almost 21,000 items posted for sale during a 24-hour period.<sup>8</sup> The eBay Classifieds site averaged 35 daily postings and the Free Market and Freecycle sites both averaged 19 daily postings.

Motor vehicles and parts comprise the largest Craigslist and eBay Classifieds categories (21 percent and 37 percent of postings, respectively). The typical car price is around \$4,000. The most common non-motor vehicle items are furniture, household items, antiques, and baby and kids' items, and about half are priced under \$100.

An unknown percent of postings likely go unsold, and the four sites are not part of the buyer-seller financial transaction, so total sales are unavailable. This information is critical to reliably estimate total economic activity for person-to-person sales.

<sup>8</sup> See Appendix C.



## Description of Minnesota's Economy

This section describes qualitatively the impact on Minnesota's economy when consumers buy used items or rent or repair items rather than buying new items. This information provides context for the next section by answering these questions:

- When consumers save money buying used items (as opposed to new), what do they do with their savings? Is this money used to buy more items that would not have been purchased otherwise, spent on services, or saved?
- How do Minnesotans' savings circulate through the economy? Does money spent in Minnesota stay here?
- Does money spent on services "leak" more slowly out of the state's borders than money spent on goods (as the services are more likely to be in-state, while the goods are more likely to be produced out-of-state). Does this leave more money in Minnesota's economy?
- To the extent that less money spent on consumer goods results in more money spent on services, what happens to the money spent on services?
- How does buying reused compare with the alternative, which is buying new products in terms of impact on the economy? How does buying reused compare to buying from a store that sells mostly new items only? How much of each dollar spent on reused goods stays in the state compared to a dollar spent on new goods?

### Composition of Minnesota's economy

In 2009, Minnesota private and public sector organizations produced \$258 billion of goods and services (Table 8).<sup>9</sup> The five largest industries are real estate rental and leasing, manufacturing, government services, finance and insurance services, and health care and social assistance administration (56 percent). Gross domestic product excludes the value of used items, which were counted in a previous year's output when new, but includes the value of services associated with selling a used item.

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<sup>9</sup> This figure, called gross domestic product (GDP), represents Minnesota labor and capital's value added to production. Value added "is gross output (sales or receipts and other operating income, commodity taxes, and inventory change) less the value of its intermediate inputs (consumption of goods and services purchased from other U. S. industries or imported)." U.S. Department of Commerce – Bureau of Economic Analysis, *Gross Domestic Product by State Estimation Methodology*, 2006, page 2.  
<https://www.bea.gov/regional/pdf/gsp/GDPState.pdf#page=8>

Table 8. 2009 Minnesota gross domestic product, in billions of dollars

<b>Industry</b>	<b>Billions</b>	<b>Percent</b>
Real estate and other asset rental and leasing <sup>10</sup>	\$33.3	13%
Manufacturing-durable and nondurable goods	\$32.0	12%
Government	\$28.0	11%
Finance and insurance	\$26.2	10%
Health care and social assistance	\$23.9	9%
Wholesale trade	\$16.7	6%
Professional and technical services	\$16.4	6%
Retail trade (including after-sale repair services)	\$13.8	5%
Construction	\$9.8	4%
Management of companies and enterprises	\$9.4	4%
Information (publishing, media, data services)	\$9.3	4%
Transportation and warehousing	\$6.6	3%
Other services (includes personal and repair services)	\$6.0	2%
Accommodation and food services	\$5.9	2%
Administrative, clerical and support services	\$5.7	2%
Agriculture, forestry, fishing, and hunting	\$5.2	2%
Utilities	\$4.2	2%
Educational services	\$2.5	1%
Arts, entertainment, and recreation	\$2.3	1%
Mining	\$0.3	0.1%
<b>Total</b>	<b>\$257.6</b>	<b>100%</b>

Source: U.S. Bureau of Economic Analysis. <https://www.bea.gov/regional/gsp/>.

Figures are rounded. Industry definitions are at <https://www.bea.gov/regional/definitions>.

Two-thirds of Minnesota's output is services, but individuals consume and directly pay for a smaller percentage. Depending on how broadly or narrowly defined, 15 to 20 percent of Minnesota's output could be considered services provided to an individual within the state (Table 9).

Table 9. Services to individuals as a percent of Minnesota's gross domestic product

<b>Mostly personal services:</b>	<b>Percent</b>
Information (publishing, media, data services)	4%
Other services (includes personal and repair services)	2%
Accommodation and food services	2%
Educational services	1%
Arts, entertainment, and recreation	1%
<b>Some portion are personal services:</b>	
Professional and technical services	6%
Retail trade (including after-sale repair services)	5%

Source: Table 8.

<sup>10</sup> Includes the imputed value of owner-occupied housing.

## Consumer spending patterns

Housing, transportation, personal insurance and pensions, food, and healthcare comprise 80 percent of the typical Twin Cities household's expenditures (Table 10). An extra dollar of income is likely spent on these goods and services.

Table 10. 2008-2009 average annual household expenditures for Minneapolis – St. Paul metropolitan statistical area

Category	Dollars	Percent
Housing	\$19,164	34%
Transportation	\$8,833	16%
Personal insurance & pensions	\$6,969	12%
Food (at home & away)	\$6,887	12%
Healthcare	\$3,314	6%
Entertainment	\$3,217	6%
Cash contributions	\$2,518	4%
Apparel & services	\$1,864	3%
Education	\$871	2%
Miscellaneous	\$832	1%
Personal care products & services	\$733	1%
Alcoholic beverages	\$683	1%
Tobacco products & smoking supplies	\$328	1%
Reading	\$128	0.2%
<b>Total</b>	<b>\$56,341</b>	<b>100%</b>

Source: U. S Bureau of Labor Statistics – Consumer Expenditure Survey, *Table 22. Selected Midwestern metropolitan statistical areas: Average annual expenditures and characteristics, Consumer Expenditure Survey, 2008-2009*, October 2010.  
<http://www.bls.gov/cex/2009/msas/midwest.xls>.

Consumer spending is directed towards the basic necessities and any discretionary income gained from reuse activities will likely have a small impact on Minnesota's economy, especially if spent on personal services. However, personal services are more likely to be produced in Minnesota because the services are provided to an individual, such as hair styling, dining out, entertainment, gym memberships and dry cleaning.

## The economics of reuse

Academic researchers have not studied extensively the economics of reuse. One study noted that, "Over the past four decades, economists have investigated recycling. However, only a few studies have been performed so far that address the economics of reuse."<sup>11</sup> Web and online catalogue searches found a few academic papers, which mostly discuss theoretical models of consumer and producer behavior, pricing effects on new items, and waste disposal impacts.

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<sup>11</sup> Yokoo, Hide-Fumi, "An Economic Theory of Reuse." Copyright by Integrated Research System for Sustainability Science, United Nations University, and Springer 2009. Published online on October 15, 2009. <http://www.springerlink.com/content/265421gu453m33w8/>.

Management Analysis & Development interviewed five experts to understand the reuse sector's economic impacts:

- An Iowa State University associate scientist who conducts regional economic impact studies on recycling, reuse and other industries and was a consultant to the 2001 *U.S. Recycling Economic Information Study*, which estimated the number of direct, indirect and induced jobs.
- The Minnesota Department of Employment and Economic Development's economic analysis director, who studies Minnesota's business sectors and jobs.
- The Minnesota state economist, who produces the Minnesota Department of Management & Budget's state revenue forecasts and is a University of Minnesota – Twin Cities professor.
- A University of Minnesota – Twin Cities associate professor and extension economist who studied the economics of solid waste disposal.
- A vice president of a national consulting firm's solid waste practice, which conducted the 2001 *U.S. Recycling Economic Information Study* and similar economic impacts studies for individual states.

Interviewees agreed that reuse keeps money local and that the economic impact increases with the amount of activity within Minnesota. They explained why:

- “Is there a local connection and is the company based here to capture the capital gains? Certainly, personal services are more likely performed in Minnesota than a manufactured product.”
- If you buy a used t-shirt [locally for] \$10 rather than \$20, that \$10 goes largely to the person that sold it to you. You have another \$10 to spend on something new as well. There is an extra round of spending...an extra kick from the \$10 in savings.”
- “It depends on the items you buy. In general, reuse is keeping more money in your economy.”

For example, 34 percent of every auto repair dollar is for employee compensation, 17 percent is for gross operating surplus, and 13 percent for vehicle parts nationally. The remaining dollar is spent on taxes (5 percent), real estate (3 percent) and a multitude of services and goods.<sup>12</sup> A locally- owned repair-business could retain at least 50 percent of the repair dollar in the state (payroll, gross surplus and locally purchased services). In contrast, new car dealerships' payroll, advertising and rent expenses are 13 percent of total new car sales nationally.<sup>13</sup>

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<sup>12</sup> Bureau of Economic Analysis, 2002 Benchmark Detailed Input-Output Table for U.S.; Commodity-by-Industry Direct Requirements, NAICS 8111A0 (Automotive repair and maintenance, except car washes). <http://www.bea.gov/industry/>. Equivalent information is unavailable for new car dealerships.

<sup>13</sup> National Automobile Dealers Association, *State of the Industry Report 2011*, page 3. [http://www.nada.org/NR/rdonlyres/0798BE2A-9291-44BF-A126-0D372FC89B8A/0/NADA\\_DATA\\_08222011.pdf](http://www.nada.org/NR/rdonlyres/0798BE2A-9291-44BF-A126-0D372FC89B8A/0/NADA_DATA_08222011.pdf).

One web site stated that “reuse companies tend to be small and locally owned and operated, providing local jobs and increased capital retention.”<sup>14</sup> However, the interviewed economists believe reuse activities provide little value added. A couple noted that retail activity generally has little value added because few items are Minnesota made and repair services require parts, not just in-state labor. Minnesota’s gross domestic product excludes the value of used items, which were counted in a previous year’s output when new, but includes the value of services from repurposing and selling them.

Another website noted that reuse’s environmental and economic benefits increase with the item’s size and cost: “new furniture is both resource-intensive and expensive. Repair, repainting, and reupholstering of used furniture can replace the purchase of new furniture.”<sup>15</sup> While reuse extends the useful life of expensive-but-infrequently-purchased durable goods, such as furniture, cars, and large home-appliances, a national recycling study describes reuse’s limitation: “the [value added] cannot exceed the value inherent in a new product made from raw materials – otherwise people would buy the new product.”<sup>16</sup> One exception is antiques, whose value can exceed new items, depending on scarcity, quality, availability of reproductions and collecting trends.<sup>17</sup>

Interviewees also stated that reuse spending primarily benefits the individual consumer but has no effect on the macro-economy:

- “The economy doesn’t care how the money is spent. Reuse allows you to stretch your dollar but hasn’t expanded the economy.”
- “The consumer who buys used will buy something else or save it, both of which help the economy. But the impacts are probably the same proportion whether new or used: the money will get recycled one way or the other.”
- “Some would argue that reuse has very little economic impact other than providing more choices to consumers.”
- “For the individual, he is better off, whether the item is produced here or elsewhere. The money he saves is the same as he gets in his paycheck.”

Interviewees suggested analyzing specific items and consumer behavior to understand the reuse sector’s economic impacts. Some interviewees recommended including materials and energy savings, transportation and sorting costs, and resource scarcity factors. Any analysis should consider:

- How much of a product or service is produced locally.
- The reused product’s original resource requirements.

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<sup>14</sup>Institute for Local Self-Reliance, “Job Creation Through Product Reuse.” <http://www.ilsr.org/recycling/reusejobs.html>.

<sup>15</sup> Advameg, Inc., Pollution Issues. <http://www.pollutionissues.com/Re-Sy/Reuse.html>.

<sup>16</sup> R. W. Beck, Inc., *U.S. Recycling Economic Information Study*, prepared for the National Recycling Coalition, July 2001, page 4-14. [http://www.epa.gov/osw/conserve/rrr/rmd/rei-rw/pdf/n\\_report.pdf](http://www.epa.gov/osw/conserve/rrr/rmd/rei-rw/pdf/n_report.pdf).

<sup>17</sup> Lennon Hall Antiques, “Top 10 collectible value factors.” <http://www.upon-bamboo-fly-fishing-rods-and-reels.com/top-10-collectible-value-factors.html>.

- The reused product's remaining useful life.
- The economic activity displaced by the reuse spending.
- How consumers spend their savings from reuse activities.

During the latest economic downturn, the news media reported that more consumers were buying used goods and bartering to save money and that thrift stores experienced significant increases in sales and new customers. New consignment and thrift stores opened, too. Often consumers directed the savings to reduce debt or make home improvements or to adjust their spending to less household income.<sup>18</sup> A Federal Reserve Bank report noted that “a large proportion of families in all wealth groups and across the range of changes in wealth expressed the need for greater precautionary savings.”<sup>19</sup> One interviewed economist stated that banks invest deposits for the highest rates of return, which might be out-of-state or even internationally.

A few reuse industries are shrinking. One report explains that online and cable subscription services have eroded the DVD, game and video rental-store market, while higher disposable incomes and low-priced imports have encouraged people to buy rather than rent formal wear.<sup>20</sup> In contrast, online used merchandise purchases are growing, evident by the success of eBay and Craigslist. One source noted that the recession has played a major role, but suggested that “a shift in values” towards green purchasing habits is occurring.<sup>21</sup>

In conclusion, reuse activities retain and recirculate money in a local economy, offer consumers more choices and “stretch” consumers’ dollars. However, the multiplier effect diminishes as the economy becomes larger because reuse spending displaces other spending within the same economy. Economic impacts may differ by specific reuse activity and are also influenced by consumers’ current finances, tastes, and basic needs. Additionally, demand for used purchases, repairs and rental services fluctuate over time depending on economic condition and new developments in products and services.

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<sup>18</sup> USA Today, “Consumers are spending, but on used goods, debt payments,” May 18, 2009, [http://www.usatoday.com/money/economy/2009-05-18-consumers-spending-recession\\_N.htm](http://www.usatoday.com/money/economy/2009-05-18-consumers-spending-recession_N.htm); The New York Times, “In a Tight Holiday Season, Some Turn to Barter,” December 22, 2010, <http://www.nytimes.com/2010/12/23/science/earth/23swap.html?scp=1&sq=%22Secondhand+Items+Gain+Some+Respect%22&st=nyt&pagewanted=print>; and Brandweek, “Will Interest in Secondhand Goods Outlive the Recession?”, October 31 2009, <http://www.adweek.com/news/advertising-branding/will-interest-secondhand-goods-outlive-recession-105925?pn=1>.

<sup>19</sup> Federal Reserve Board – Divisions of Research & Statistics and Monetary Affairs, “Surveying the Aftermath of the Storm: Changes in Family Finances from 2007 to 2009,” March 2011, page 22. <http://www.federalreserve.gov/pubs/feds/2011/201117/201117pap.pdf>.

<sup>20</sup> Van Beeck, Toon, “Ten Key Industries That Will Decline, Even After the Economy Revives,” *Commercial Insights*, American Bankers Association – Center for Commercial Lending & Business Banking, May 2011, page 4. <http://www.ibisworld.com/Common/MediaCenter/Dying%20Industries.pdf>.

<sup>21</sup> Brandweek, “Will Interest in Secondhand Goods Outlive the Recession?”, October 31 2009, <http://www.adweek.com/news/advertising-branding/will-interest-secondhand-goods-outlive-recession-105925?pn=1>.

# The Minnesota Reuse Sector's Economic Activity

This section estimates the reuse sector's activity in Minnesota's economy through the:

- Number of paying jobs, total wages paid and average weekly wage.
- Number of indirect and induced jobs.
- Contribution of sales to Minnesota's economy.
- Taxes paid to government.
- Value of diverted used items and the avoided disposal costs.
- Number and dollar value of volunteer hours.

## Number of paying jobs, total wages paid and average wage

The reuse sector's estimated 46,000 full-time employees are 1.8 percent of Minnesota's 2.6 million employed workers. The sector's estimated \$1.1 billion in wages was almost 1 percent of Minnesota's \$119.7 billion payroll in 2010 (Table 11). For comparison, Minnesota's tourism sector had 238,000 full- and part-time jobs, \$11 billion in sales and \$3.9 billion in wages in 2009.<sup>22</sup> Minnesota's agriculture sector had 98,000 jobs and \$15.8 billion in sales 2008.<sup>23</sup>

Table 11. Reuse sector's annual wages, in millions, and average weekly wage

NAICS code and industry	Annual wages (millions)	Average weekly wage
326212 Tire retreading	Data unavailable	
423140 Used motor vehicle parts	\$21.8	\$646
441110 New car dealers	\$256.1	\$842
441120 Used car dealers	\$49.7	\$642
441210 Recreational vehicle dealers	\$7.2	\$708
441221 Motorcycle dealers	\$8.3	\$628
441222 Boat dealers	\$4.4	\$645
441229 All other motor vehicle dealers	\$2.8	\$680
441320 Tire dealers	\$22.3	\$712
453310 Used merchandise stores	\$50.0	\$346
522298 Pawn shops	No comparable data	
532120 Recreational vehicle rental	No comparable data	
532210 Consumer electronics & appliances rental	\$0.4	\$620
532220 Formal wear & costume rental	\$6.0	\$399

<sup>22</sup> State of Minnesota – Explore Minnesota Tourism, *Tourism and Minnesota's Economic Recovery*, page 1, March 2011. [http://industry.exploreminnesota.com/wp-content/uploads/2011/01/Tourism\\_and\\_Economy\\_2011\\_edition\\_2-7-11.pdf](http://industry.exploreminnesota.com/wp-content/uploads/2011/01/Tourism_and_Economy_2011_edition_2-7-11.pdf)

<sup>23</sup> Minnesota Department Of Agriculture – Agricultural Marketing Services Division, *Economic Impact of Minnesota's Agriculture*, 2010, page 3. <http://www.mda.state.mn.us/~media/Files/food/business/economics/econimpactmnag.ashx>



NAICS code and industry	Annual wages (millions)	Average weekly wage
532230 Video tape & disc rental	\$12.8	\$266
532291 Home health equipment rental	No comparable data	
532292 Recreational goods rental	\$4.0	\$300
532299 All other consumer goods rental	\$20.9	\$718
532310 General rental centers	\$29.7	\$658
532420 Office machinery & equipment rental	No comparable data	
532490 Other machinery & equipment rental	\$23.7	\$1,159 <sup>24</sup>
811111 General automotive repair	\$149.4	\$678
811112 Automotive exhaust system repair	\$6.1	\$659
811113 Automotive transmission repair	\$11.9	\$714
811118 Other automotive mech. & elec. repair	\$14.3	\$675
811121 Automotive body, paint, & interior repair	\$156.4	\$805
811122 Automotive glass replacement shops	\$27.7	\$756
811198 All other automotive repair	\$4.9	\$488
811211 Consumer electronics repair	\$2.1	\$908
811212 Computer & office machine repair	\$24.3	\$984
811213 Communication equipment repair	\$2.6	\$788
811219 Other electronic & precision equip. repair	\$30.4	\$1,093
811310 Commercial machinery repair	\$128.3	\$902
811411 Home & garden equipment repair	\$2.5	\$437
811412 Appliance repair	\$7.5	\$891
811420 Reupholstery & furniture repair	\$5.3	\$593
811430 Footwear & leather goods repair	\$1.0	\$436
811490 Other personal & household goods repair	\$18.7	\$454
<b>Reuse sector total</b>	<b>\$1,113.5</b>	<b>\$674</b>

Source: Minnesota Department of Employment and Economic Development – 2010 Quarterly Census of Employment and Wages (annual data). <http://www.positivelyminnesota.com/apps/lmi/qcew/AreaSel.aspx>. Eight industries' annual wages were apportioned by the estimated reuse percentages. DEED does not publish the tire retreading industry's data because of too few firms (six). Four industries' DEED data was not directly comparable with the Dun & Bradstreet dataset, and are labeled as "No comparable data."

The reuse sector's average weekly wage was \$674 for part-time and full-time employment, 25 percent less than the statewide average of \$899.<sup>25</sup> The reuse sector's 1.8 percent employment proportion is higher than its 1 percent of wages proportion because:

- The wage data excludes sole proprietors, who represent 13 percent of the 46,000 reuse jobs. Their weekly income could raise or lower the average weekly reuse wage.
- The reuse sector's average weekly wage is less than the statewide average.

<sup>24</sup> This weekly average is likely an outlier caused by one or two unique firms. The DEED data shows 75 firms with 390 employees.

<sup>25</sup> Minnesota Department of Employment and Economic Development – 2010 Quarterly Census of Employment and Wages (annual data), which covers 97 percent of Minnesota employment, but excludes sole proprietors, self-employed, family farmers and commission-based employment. <http://www.positivelyminnesota.com/apps/lmi/qcew/AreaSel.aspx>.



## Estimated indirect and induced jobs

MPCA staff entered the reuse sector's total jobs into the Regional Economic Models, Inc. (REMI) Policy Insight 2 region-economic modeling software program to estimate the number of indirect and induced jobs resulting from reuse sector employment and spending activity. The 46,000 direct reuse jobs cause another 4,600 indirect jobs and 8,300 induced jobs (Table 12). The few indirect and induced jobs reflect the low value-added and low-wage nature of reuse jobs. While the Twin Cities Metro and Greater Minnesota have almost the same number of direct and indirect jobs, the Twin Cities Metro's induced jobs are half of Greater Minnesota's, perhaps reflecting spending leakage to Wisconsin.

Table 12. Estimated total jobs of Minnesota's reuse sector

Area	Direct jobs	Indirect jobs	Induced jobs	Total jobs
Twin Cities Metro	23,270	2,489	3,170	28,929
Greater Minnesota	22,570	2,155	5,160	29,885
<b>State total</b>	<b>45,840</b>	<b>4,644</b>	<b>8,330</b>	<b>58,814</b>

Source: see Appendix D. Indirect jobs support the reuse sector, such as an auto-repair shop's uniform supplier. Induced jobs are created when employees in the direct and indirect jobs purchase goods and services. Examples are grocery and clothing store jobs.

The job estimates exclude out-of-state activity resulting from Minnesota economic activity and do not predict net changes if the reuse sector grows or shrinks. For example, if a number of reuse businesses closed, their customers would spend money at other Minnesota businesses, offsetting the reuse sector's job loss.

## Contribution of sales to Minnesota's economy

The reuse sector's \$4 billion in sales is approximately 1.6 percent of Minnesota's \$258 billion gross domestic product in 2009. The Dun & Bradstreet data represents total revenues, while gross domestic product measures firms' value-added (revenues less purchases from other firms). The two numbers are defined and measured differently, but overlap. The Dun & Bradstreet dataset excludes a number of large employers' sales data, so the 1.6 percent figure likely understates the reuse sector's contribution to Minnesota's economy even though the dataset uses a broader financial measure.

In contrast, the REMI model estimates the reuse sector's sales at \$2.3 billion, based on 46,000 direct jobs. The difference with Dun & Bradstreet's \$4 billion cannot be reconciled because each source used different data and assumptions. While the Twin Cities Metro and Greater Minnesota have almost the same number of direct jobs, the Twin Cities' estimated \$1.4 billion value-added is 60 percent more than Greater Minnesota's estimated \$900 million.

## Taxes paid to government agencies

The REMI model estimates that the 46,000 reuse jobs generate an estimated \$159 million in state business and personal income taxes, sales tax, excise tax and miscellaneous taxes.

## **Value of diverted used items and the avoided disposal costs**

Minnesota's three largest thrift-store operators rely on households and businesses to donate goods for resale. These goods might have been disposed through the solid waste stream, but were donated for charitable reasons. Arc Value Villages, Goodwill Stores and Salvation Army Thrift Stores generate \$53 million in Minnesota sales annually and divert at least 11,000 tons of items from landfills.<sup>26</sup>

The stores mostly accept clothes, books, small electronics and other household items. Furniture is accepted upon manager approval or if not stained, broken or torn. Vehicles are also accepted. Two operation directors described their typical customer:

- “83 percent are female, average age is 49; educated; primarily Caucasian but growing diversity of shoppers; 50 percent of income levels are over \$50,000.”
- “85 percent are female, ranging from 25 to 55 years old; persons who live within 10 miles of the store. Thrift stores were once shopped by welfare clients. Today it is those on welfare to the wealthy, incomes from \$25,000 to \$75,000.”

The directors noted that donated materials are sold through stores or recycled. One stated that, “Clothing is 60% of our business and [all of it] is sold in our stores or to third-world nations. For furniture and household items, about 50 percent is sold off in our stores and the other 50 percent is not fit for the sales floor, so the parts are sold in secondary markets and the rest goes into landfills.” Another said that two-thirds of donated items by weight are sold or recycled, with over half being recycled.

At \$200 per ton, 11,000 tons of diverted material avoids \$2.2 million in gross disposal costs.<sup>27</sup> In addition, stores often are able to sell a percentage of their excess materials to recycling markets. These avoided costs and additional revenue are offset by the cost to handle donated items and dispose of unsalable material.

## **Number and dollar value of volunteer hours**

Both paid employees and volunteers operate Arc Value Villages and Goodwill Stores, while the Salvation Army's rehabilitation-program participants assist paid staff, with very little community volunteers. Paid employees are often part-time.

Arc Value Villages and Goodwill Stores reported 154,000 annual volunteer hours, which equates to \$1.1 million to \$1.5 million depending on the value of a volunteer hour.<sup>28</sup>

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<sup>26</sup> Data collected from telephone calls, e-mail and Goodwill's and Salvation Army's most recent annual reports: <http://www.thesalarmy.org/ab/2009NorthernDivAnnualReport.pdf> and [http://www.goodwilleasterseals.org/site/DocServer/2010\\_Annual\\_Report.pdf?docID=2462](http://www.goodwilleasterseals.org/site/DocServer/2010_Annual_Report.pdf?docID=2462).

<sup>27</sup> Gross cost per ton provided by the Minnesota Pollution Control Agency and includes collection and transportation costs and landfill fees.

<sup>28</sup> The low estimate uses the minimum wage (\$7.25) and the high estimate uses \$10 per hour, which is the median wage for stock clerks and retail salespersons, per the Minnesota Department of Employment and Economic Development's first quarter 2011 Occupation Employment Statistics. <http://www.positivelyminnesota.com/apps/lmi/oes/>. The hourly rates exclude fringe benefits.

## Conclusions

If broadly defined as used sales, repairs and rental services, Minnesota's reuse sector directly employs almost 46,000 people and generates at least \$4 billion in gross sales annually, or 1.8 percent of Minnesota employees and 1.6 percent of the state's gross domestic product. For comparison, the tourism sector has 238,000 employees and \$11 billion in sales.

Automotive-related industries represent 75 percent of the reuse sector's revenues and 60 percent of employees. Vehicles are a significant household purchase and remain in service for eleven years, on average. Car owners have an incentive to maintain their vehicles to avoid breakdowns and preserve resale values. Other large reuse industries are used merchandise sales and durable-good repair, such as commercial machinery, electronic and precision equipment, and household appliances.

Reuse industries' average weekly wages are typically less than Minnesota's weekly average for all employer-paid wages. The lower average likely reflects the part-time work and lower skills required by many reuse industries. Notable exceptions are the electronic, computer, precision equipment, commercial machinery and appliance repair industries, where the average weekly wages slightly exceed the state average.

When the state is examined by centroid, which are large multi-county areas, the reuse jobs and sales are almost proportional to each centroid's population. At the county level, reuse activity has little relationship to population. However, counties with a high number of reuse jobs also have high total employees per capita, suggesting that a high reuse ratio is not a unique characteristic but related to the county's overall employment.

The economic impacts of reuse activities are mostly local. Businesses benefit through greater money retention and recirculation, and consumers have more choices and greater purchasing power. At the macro-economic level, the reuse sector's impact is no different than other industries' impact. In one sense, reuse activity is similar to economic development strategies that move the economic activity's location but does not increase it. High value-adding repair activities requiring skilled employees have a greater community impact than low-value activities, such as used goods sales and rentals.

Consumers' current finances, tastes, and basic needs affect demand for used items and repair and rental services. During the latest economic downturn, used thrift stores sales and first-time customers increased noticeably. Online trading sites allow people to buy and sell secondhand items more easily than traditional classified ads, perhaps increasing the amount of used goods exchanged.

## **Appendices**

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**B: List of Reuse Industries    33**

**C: Online-Exchange Research    38**

**D: Job Projections and Economic Activity    40**

## A: Detailed Methodology

### Data source

MPCA and Management Analysis staff considered three data sources before purchasing the Dun & Bradstreet data, which has the most current and complete listings for the state and counties (Table 13).<sup>29</sup> Two other options were the U.S. Census Bureau's 2007 Economic Census and the Minnesota Department of Employment and Economic Development's Unemployment Insurance Program public datasets. However, these two datasets provide summary data, not individual records, and small industry and geographic area data is often unavailable to avoid disclosing an individual firm's information.

Table 13. Dataset comparison

Source	Description	Advantages	Disadvantages
Dun & Bradstreet <sup>30</sup> (used for this study)	<ul style="list-style-type: none"> <li>• Dun &amp; Bradstreet supplements the Minnesota Secretary of State's business filings with actual and estimated employee and sales figures.</li> <li>• Dun &amp; Bradstreet assigns NAICS by verifying directly with the business owner or by using the business name to determine the business type.</li> </ul>	<ul style="list-style-type: none"> <li>• Includes sole proprietors.</li> <li>• Includes firm sales.</li> <li>• 2009 data.</li> <li>• Lists each firm name and its sales and employees so miscoded ones can be identified and excluded.</li> </ul>	<ul style="list-style-type: none"> <li>• Estimates 28 percent of the firms' employee count and 75 percent of sales "based on defined norms for the industry and size of business."</li> <li>• Excludes sales data for chain stores and privately held companies.</li> <li>• Purchase required.</li> </ul>
Minnesota Unemployment Insurance <sup>31</sup>	<ul style="list-style-type: none"> <li>• Uses mandatory unemployment insurance data.</li> <li>• Each employer selects a NAICS code.</li> </ul>	<ul style="list-style-type: none"> <li>• 2010 data.</li> <li>• Actual counts, not estimates.</li> <li>• Previous years' data provides time-series.</li> <li>• No cost to acquire.</li> </ul>	<ul style="list-style-type: none"> <li>• Excludes sole proprietors, self-employed and people on commission.</li> <li>• Excludes firm sales.</li> <li>• Data suppressed for small industries and counties.</li> </ul>
2007 U.S. Economic Census <sup>32</sup>	<ul style="list-style-type: none"> <li>• Survey of all large and mid-sized businesses and a sample of small businesses, joined with other federal datasets, such as unemployment and tax returns.</li> <li>• Businesses select NAICS code but Census staff review by using submitted information.</li> </ul>	<ul style="list-style-type: none"> <li>• Businesses are required to participate.</li> <li>• Extensive data editing and validation to improve accuracy.</li> <li>• Statistical measures of reliability provided.</li> <li>• No cost to acquire.</li> </ul>	<ul style="list-style-type: none"> <li>• Collected every five years. Current dataset is from 2007.</li> <li>• Data suppressed for small industries and counties.</li> <li>• Sole proprietor data unavailable at six-digit NAICS level.</li> </ul>

<sup>29</sup> The 2011 Brookings Institute study, *Sizing the Clean Economy: A National And Regional Green Jobs Assessment* also used Dun & Bradstreet data for state-by-state analysis.

[http://www.brookings.edu/~media/Files/Programs/Metro/clean\\_economy/0713\\_clean\\_economy.pdf](http://www.brookings.edu/~media/Files/Programs/Metro/clean_economy/0713_clean_economy.pdf).

<sup>30</sup> Dun & Bradstreet Government Division – Data Elements. <http://www.dnbgov.com/db-data/data-elements>.

<sup>31</sup> "About the Quarterly Census of Employment and Wages."

[http://www.positivelyminnesota.com/Data\\_Publications/Data/All\\_Data\\_Tools/Quarterly\\_Census\\_of\\_Employment\\_Wages\\_\(QCEW\)\\_2.aspx](http://www.positivelyminnesota.com/Data_Publications/Data/All_Data_Tools/Quarterly_Census_of_Employment_Wages_(QCEW)_2.aspx).

<sup>32</sup> 2007 Economic Census Overview. <http://www.census.gov/econ/census07/>.

The three datasets also differ because:

- The data-collecting agency assigns the NAICS code or a business self-selects one. As a result, the same establishment may be coded differently in each dataset, and one dataset's total establishments and employees will not match another's (Table 14).
- The 2007 Economic Census data predates the latest economic recession and the Unemployment Insurance Program excludes sole proprietors and sales data.
- Dun & Bradstreet counts full-time employees only while the other two datasets count full- and part-time employees.
- The datasets represent different years and data-collection methods.

Table 14. Comparison of data sources' firm and employee counts.

NAICS industry and code	Dun & Bradstreet (original dataset)		2010 Unemployment Insurance Wages		2007 Economic Census	
	Firms	Employ- ees	Firms	Employ- ees	Firms	Employ- ees
326212 Tire retreading	6	99	Data unavailable		8	Unavail.
423140 Used motor vehicle parts	125	833	57	650	35	280
441110 New car dealers	831	16,778	373	16,225	469	18,789
441120 Used car dealers	670	2,087	353	1,486	425	1,569
441210 Recreational vehicle dealers	89	789	72	643	86	849
441221 Motorcycle dealers	182	1,271	112	1,208	130	1,472
441222 Boat dealers	225	1,286	130	779	179	1,393
441229 All other motor vehicle dealers	387	1,376	84	413	74	505
441320 Tire dealers	368	2,403	305	2,864	305	2,979
453310 Used merchandise stores	1,080	3,215	324	2,774	322	3,159
522298 All Other Nondepository Credit Intermediation (includes pawn shops)	253	1,871	239	2,386	95	Unavail.
532120 Truck, Utility Trailer, and RV Rental and Leasing	362	1,632	92	547	106	691
532210 Consumer electronics & appliances rental	34	136	6	13	Data unavailable	
532220 Formal wear & costume rental	64	238	43	289	38	284
532230 Video tape & disc rental	305	1,510	272	937	291	2,510
532291 Home health equipment rental	36	658	33	596	48	392
532292 Recreational goods rental	60	282	39	258	35	124
532299 All other consumer goods rental	181	1,264	74	559	42	Unavail.
532310 General rental centers	11	122	159	866	108	644
532420 Office machinery & equipment rental	21	61	27	143	18	93
532490 Other machinery & equipment rental	737	2,740	74	393	102	1,112

NAICS industry and code	Dun & Bradstreet (original dataset)		2010 Unemployment Insurance Wages		2007 Economic Census	
	Firms	Employ- ees	Firms	Employ- ees	Firms	Employ- ees
811111 General automotive repair	2,921	8,715	1,356	5,574	1,641	7,377
811112 Automotive exhaust system repair	125	466	60	177	40	105
811113 Automotive transmission repair	147	533	99	319	107	353
811118 Other automotive mech. & elec. repair	742	2,278	136	407	76	261
811121 Automotive body, paint, & interior repair	1,400	5,637	756	3,735	782	3,994
811122 Automotive glass replacement shops	229	742	107	704	160	812
811198 All other automotive repair	324	2,240	77	192	46	130
811211 Consumer electronics repair	150	372	27	45	30	285
811212 Computer & office machine repair	285	1,319	96	475	93	793
811213 Communication equipment repair	24	65	22	64	32	343
811219 Other electronic & precision equip. repair	691	2,802	104	534	70	599
811310 Commercial machinery repair	911	2,694	567	2,732	515	3,054
811411 Home & garden equipment repair	180	342	53	111	40	Unavail.
811412 Appliance repair	1,374	2,090	39	160	79	Unavail.
811420 Reupholstery & furniture repair	444	910	81	172	92	243
811430 Footwear & leather goods repair	79	167	19	43	24	41
811490 Other personal & household goods repair	1,030	1,993	337	789	228	650
<b>Totals</b>	<b>17,083</b>	<b>74,016</b>	<b>6,804</b>	<b>50,262</b>	<b>6,971</b>	<b>55,885</b>

Only the Dun & Bradstreet dataset includes sole proprietors. "Original dataset" is the June 8, 2011 Dun & Bradstreet dataset before Management Analysis' adjustments and exclusion of non-reuse and zero-employee firms.

### Removal of outliers

Management Analysis & Development reviewed the Dun & Bradstreet dataset to remove potentially large outliers by:

1. Identifying the firms with more than 5 percent of a six-digit category's total sales or Minnesota employees.
2. Reviewing the firm's website to determine if the products and services meet the reuse definition.

3. Excluding any firms not fitting the six-digit category due to NAICS miscoding or the MPCA’s reuse definition.<sup>33</sup>

Firms were also excluded based on company names. For example, pawn shops are classified with a number of financial entities in All Other Nondepository Credit Intermediation (522298). Firms without “pawn” in its name were excluded. Table 15 describes the 1,248 excluded firms. Another 475 firms without any Minnesota employees were excluded for a total of 1,723 excluded firms (Table 16).

Table 15. Number and description of excluded firms

Industry	Firms	Reason
423140 Used motor vehicle parts	1	A municipal city garage.
441120 Used car dealers	1	A large dealer-to-dealer auto auction firm.
441210 Recreational vehicle dealers	2	One leasing company and a fabrication firm.
441222 Boat dealers	1	A canvas boat-cover fabricator.
441229 All other motor vehicle dealers	2	A manufacturer and an aviation firm.
453310 Used merchandise stores	2	A medical center and a college bookstore.
522298 All Other Nondepository Credit Intermediation	163	Companies without “pawn” in name.
532120 Recreational vehicle rental	338	Firms providing self-moving trailer rental, truck leasing, self-storage and mobile home site rental.
532210 Consumer electronics & appliances rental	5	The top four businesses are a billiards parlor, an electronics assembly equipment manufacturer and two firms whose websites could not be found. The fifth exclusion is a financial services firm.
532230 Video tape & disc rental	1	A miscoded gas station.
532291 Home health equipment rental	5	A medical equipment management firm listed twice, a regional oxygen provider, a medical center, and a highly specialized, mobile medical-equipment company.
532299 All other consumer goods rental	7	A national integrator of audio/video systems, an auto leasing firm, a pizza/video rental parlor, a vending machine rental company, a scaffolding firm, a convention booth designer, and a fabricator.

<sup>33</sup> The purchased dataset only had 38 industries. A reuse firm without one of the 38 codes would never be part of the dataset and could not be identified for inclusion.



Industry	Firms	Reason
532490 Other machinery & equipment rental	320	Firms with “leasing,” “capital,” “financing” or “U-Haul” in their names; real property, car, truck or heavy construction and industrial equipment rental firms; and firms without “rental” in their name.
811111 General automotive repair	12	Nine municipal city garages, one truck rental firm, and two parts manufacturers.
811112 Automotive exhaust system repair	1	One parts retailer.
811113 Automotive transmission repair	1	An auto dealer.
811118 Other automotive mech. & elec. repair	6	Two municipal garages and four manufacturers.
811121 Automotive body, paint, & interior repair	3	One fabricator and two duplicate listings.
811198 All other automotive repair	1	A diagnostic services firm for repair shops.
811211 Consumer electronics repair	1	A satellite TV system installer.
811212 Computer & office machine repair	7	Five companies manage IT for firms, one firm offers workflow solutions and the other is a wireless service provider.
811219 Other electronic & precision equip. repair	9	Four firms repair real property components, a national medical equipment repair company, a communications consulting firm, two manufacturers and one fabricator
811310 Commercial machinery repair	59	Firms with “fabrication” or “manufacturing” in their name.
811412 Appliance repair	9	Three heating, ventilation, and refrigeration system contractors and six fabricators.
811420 Reupholstery & furniture repair	5	A firm with new and used furniture sales and repairs, an office furniture moving and installation firm listed twice, a refinishing firm and a manufacturer.
811430 Footwear & leather goods repair	1	A large leather cleaning firm
811490 Other personal & household goods repair	285	A hospital laundry services firm, a gun manufacturer, a property management firm and 282 firms with “garage door,” “window,” “elevator” or “taxidermy” in their names.

Note: No firms were excluded from eleven reuse industries.

Table 16. Number of firms before and after exclusions

<b>Data-set description</b>	<b>Firms</b>
Original dataset	17,083
Excluded firms (Table 17)	(1,248)
Zero-employee firms	(475)
<b>Final dataset</b>	<b>15,360</b>

Management Analysis only changed four records:

- Three non-profit thrift stores' employee counts included volunteers, so Management Analysis called the stores to obtain the correct number of paid employees. The number of employees decreased from 248 to 10.
- A general rental center was miscoded as a video tape rental establishment (532230) so its six-digit NAICS was changed to 532310.

### **Apportioning sales and employees for reuse activities**

Businesses may sell used items or rent or repair items as secondary activities to their primary one. For example, new car dealerships also repair vehicles and sell used ones. The Dun & Bradstreet data does not separate a firm's sales and employees by different activities, so Management Analysis applied percentages to eight industry codes to estimate reuse activities by:

- Reviewing the six-digit NAICS code definitions to understand the type of firms and activities covered;
- Deciding if some firms or activities should be excluded as unrelated to reuse;
- Researching possible apportionment factors or calling a small number of businesses for rough estimates (Table 17); and
- Applying the apportionment factor to an industry's sales and employees (Table 18).

The firm counts were not adjusted like sales and employees were, though some firms have no reuse activities or a different proportion than the applied percentage. Management Analysis assumed that new versus used sales are spread proportionately around the state based on the total number of establishments. If half the establishments are in the metro area, then half the used sales are there, too. The smaller the geographical area, the less applicable the apportionment factor is. Management Analysis did not adjust the data for potential double counting, such as when wholesale retreaded tires and used parts are sold at retail in Minnesota.

Table 17. Sales and employee apportionment factors for select industries

Industry	Rationale and data source
441110 New Car Dealers	<p>Most Minnesota auto dealers sell used vehicles, accounting for 29 percent of total revenues. Repair parts and labor are seven percent of total revenues.</p> <p>Apportionment factor: 36%</p> <p>Source: 2007 Economic Census – Products lines for new car dealers, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p441110.htm">http://www.census.gov/econ/industry/products/p441110.htm</a></p>
441210 Recreational Vehicle Dealers	<p>Most Minnesota RV dealers sell used RVs, accounting for 23 percent of total revenues. Repair parts and labor are seven percent of total revenues, but only one-half of dealers provide this service.</p> <p>Apportionment factor: 30%</p> <p>2007 Economic Census – Products lines for RV dealers, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p441210.htm">http://www.census.gov/econ/industry/products/p441210.htm</a></p>
441221 Motorcycle Dealers	<p>Three-quarters of Minnesota motorcycle dealers sell used motorcycles, accounting for 10 percent of total revenues. Repair parts and labor are 11 percent of total revenues.</p> <p>Apportionment factor: 21%</p> <p>Source: 2007 Economic Census – Products lines for motorcycle dealers, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p441221.htm">http://www.census.gov/econ/industry/products/p441221.htm</a></p>
441222 Boat Dealers	<p>Three-quarters of Minnesota boat dealers sell used boats, accounting for 10 percent of total revenues. Repair parts and labor are 7 percent of total revenues.</p> <p>Apportionment factor: 17%</p> <p>Source: 2007 Economic Census – Products lines for boat dealers, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p441222.htm">http://www.census.gov/econ/industry/products/p441222.htm</a></p>
441229 All Other Motor Vehicle Dealers	<p>In Minnesota, 43 percent of these dealers sell new and used snowmobiles, ATVs and other sport vehicles (2007 Economic Census). About one-quarter of snowmobiles, jet skis and ATVs sales are used, per five Minnesota businesses contacted by Management Analysis. Total used sales are <math>43\% \times 25\% = 11\%</math>.</p> <p>Thirty-two percent of revenues are sales of new and used utility trailers, including horse and livestock trailers (2007 Economic Census). About 3 percent of utility trailer sales are used, per four Minnesota businesses contacted by Management Analysis. Total used sales are <math>32\% \times 3\% = 1\%</math>.</p> <p>Repair parts and labor are 7 percent of total revenues (2007 Economic Census).</p> <p>Total apportionment factor: <math>(11\% + 1\% + 7\%) = 19\%</math></p> <p>Source: 2007 Economic Census – Products lines for all other motor vehicle dealers, Minnesota detailed profile.<sup>34</sup> <a href="http://www.census.gov/econ/industry/products/p441229.htm">http://www.census.gov/econ/industry/products/p441229.htm</a></p>

<sup>34</sup> The remaining twenty-five percent of revenues are for other types of equipment and merchandise, and are not counted as part of the reuse sector.

Industry	Rationale and data source
441320 Tire Dealers	<p>Less than one-third of Minnesota tire dealers sell used tires, and used-tire revenues are 6 percent of the industry total. Repair parts are 12 percent of total revenues and labor is 14% of total revenues (for both new and used tires and repairs).</p> <p>Apportionment factor: <math>6\% + 12\% + (6\% + 12\%) * 14\% = 21\%</math></p> <p>Source: 2007 Economic Census – Products lines for tire dealers, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p441320.htm">http://www.census.gov/econ/industry/products/p441320.htm</a></p>
522298 Pawn Shops	<p>Merchandise sales are one component of pawn shop sales. Other revenue sources are financing charges and scrap metal sales. Three national firms' annual reports provided percentages for merchandise sales:</p> <ol style="list-style-type: none"> <li>1. CashAmerica 2010 annual report shows 25 percent of net revenues are from selling merchandise. <a href="http://www.cashamerica.com/Files/Annual%20reports/Cash%20America%202010%20Annual%20Report.pdf">http://www.cashamerica.com/Files/Annual%20reports/Cash%20America%202010%20Annual%20Report.pdf</a> (page 12).</li> <li>2. EZCorp 2008 annual reports shows \$90.6 million in sales (including scrap metals) out of \$281 million, or 32 percent. <a href="http://www.ezcorp.com/files/2008-AR.pdf">http://www.ezcorp.com/files/2008-AR.pdf</a> (page 4).</li> <li>3. First Cash 2010 investor presentation: \$188 million from selling merchandise out of \$432 million total sales, so 45 percent from merchandise sales. Separate from sales is \$81 million from selling scrap. <a href="http://www.firstcash.com/files/0318201101.pdf">http://www.firstcash.com/files/0318201101.pdf</a></li> </ol> <p>The preceding companies are national ones, so these percentages do not necessarily apply to Minnesota firms. Apportionment factor: the unweighted average of 25%, 32% and 45% = 34%</p>
811111 General Auto Repair	<p>Scheduled preventive maintenance and repairs are 17 percent of Minnesota general automotive repair revenues and resale of parts not used in repairs is 7 percent.</p> <p>Apportionment factor: <math>100\% - 17\% - 7\% = 76\%</math></p> <p>Source: 2007 Economic Census – Products lines for general automotive repair, Minnesota detailed profile. <a href="http://www.census.gov/econ/industry/products/p811111.htm">http://www.census.gov/econ/industry/products/p811111.htm</a></p>

Note: The 30 other reuse industries had no apportionment factors.

Table 18. Results from applying the apportionment factors

NAICS code and industry	Original data		Factor	Apportioned data	
	Sales	Employees		Sales	Employees
441110 New Car Dealers	\$3,817.2	16,873	36%	\$1,374.2	6,070
441210 Recreational Vehicle Dealers	\$162.3	737	30%	\$48.7	220
441221 Motorcycle Dealers	\$195.9	1,271	21%	\$41.1	270
441222 Boat Dealers	\$169.5	1,284	17%	\$28.8	220
441229 All Other Motor Vehicle Dealers	\$159.5	1,302	19%	\$30.3	250
441320 Tire Dealers	\$112.9	2,403	21%	\$23.7	500
522298 Pawn Shops	\$7.6	247	34%	\$2.6	80
811111 General Automotive Repair	\$581.0	8,581	76%	\$441.6	6,520

Source: Original sales and employees are from the Dun & Bradstreet dataset dated June 8, 2011 after removing excluded and zero-employee firms. Sales are in millions. Apportioned results are rounded to the nearest \$100,000 for sales and nearest 10 for employees. Thirty industries had no apportionment factors.

## B: List of Reuse Industries

For the purpose of this study, the reuse sector encompasses three activities: used product sales, rental, and repair. This definition is broader than a National Recycling Coalition study's, which excluded repair services and explained that reuse businesses "recover products or components that were *disposal-bound* and sell them back into the stream of commerce [emphasis added]." <sup>35</sup> However, other organizations consider repair a part of reuse:

- "Reuse encompasses a range of activities where whole products (or whole parts of products) are used again in one piece. This includes...Repair – rectifying a fault." <sup>36</sup>
- "Product reuse - retreading tyres, recovery of demolition materials, reuse of plastic bags, second hand clothing, reconditioning and repair of furniture and appliances." <sup>37</sup>
- "[The Zero Waste Hierarchy's second priority is] repair and reuse, extending the service life of materials and products." <sup>38</sup>

This study identified reuse industries using the North American Industry Classification System (NAICS), which classifies business establishments for federal statistical purposes. A government agency assigns a code or a business self selects one based on its primary revenue-generating activity. The six-digit code is the most detailed level and the four-digit code combines similar six-digit ones.

### Selected Industries

Thirty-eight NAICS industries meet the MPCA's reuse definition (Table 19). Management Analysis assigned each industry to a reuse activity based on the industry description and primary reuse activity. For example, tire dealers' primary reuse activity is repair because used tires sales are a smaller proportion of the business.

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<sup>35</sup> National Recycling Coalition, "Frequently Asked Questions about the U.S. Recycling Economic Information Study," October 2001, page 1. <http://www.epa.gov/osw/conserve/rrr/rmd/rei-rw/pdf/faq.pdf>.

<sup>36</sup> The Centre for Remanufacturing & Reuse. <http://www.remanufacturing.org.uk/reuse-repair-recycle.lasso>.

<sup>37</sup> The Municipal Waste Advisory Council of the Western Australian Local Government Association. <http://www.wastenet.net.au/information/hierarchy/reuse>.

<sup>38</sup> Sierra Club, *Zero Waste: Cradle-to-Cradle Principles for the 21st Century*, February 23, 2008, page 1. <http://www.sierraclub.org/policy/conservation/ZeroWasteExtendedProducerResponsibilityPolicy.pdf>

Table 19. Description of six-digit NAICS codes and industry

<b>NAICS code and industry</b>	<b>Industry description</b>	<b>Reuse activity</b>
326212 Tire retreading	Retreading or rebuilding tires.	Used sales
423140 Used motor vehicle parts	Merchant wholesale distribution of used motor vehicle parts (except used tires and tubes) and establishments primarily engaged in dismantling motor vehicles for the purpose of selling the parts.	Used sales
441110 New car dealers	Retailing new automobiles and light trucks, such as sport utility vehicles, and passenger and cargo vans, or retailing these new vehicles in combination with activities, such as repair services, retailing used cars, and selling replacement parts and accessories.	Used sales
441120 Used car dealers	Retailing used automobiles and light trucks, such as sport utility vehicles, and passenger and cargo vans.	Used sales
441210 Recreational vehicle dealers	Retailing new and/or used recreational vehicles commonly referred to as RVs or retailing these new vehicles in combination with activities, such as repair services and selling replacement parts and accessories.	Used sales
441221 Motorcycle dealers	Retailing new and/or used motorcycles, motor scooters, motorbikes, mopeds, off-road all-terrain vehicles, and personal watercraft, or retailing these new vehicles in combination with repair services and selling replacement parts and accessories.	Used sales
441222 Boat dealers	(1) Retailing new and/or used boats or retailing new boats in combination with activities, such as repair services and selling replacement parts and accessories, and/or (2) retailing new and/or used outboard motors, boat trailers, marine supplies, parts, and accessories.	Used sales
441229 All other motor vehicle dealers	Retailing new and/or used utility trailers and vehicles (except automobiles, light trucks, recreational vehicles, motorcycles, boats, motor scooters, motorbikes, off-road all-terrain vehicles, and personal watercraft) or retailing these new vehicles in combination with activities, such as Repair services and selling replacement parts and accessories.	Used sales
441320 Tire dealers	Retailing new and/or used tires and tubes or retailing new tires in combination with automotive repair services.	Repair
453310 Used merchandise stores	Retailing used merchandise, antiques, and secondhand goods (except motor vehicles, such as automobiles, RVs, motorcycles, and boats; motor vehicle parts; tires; and mobile homes).	Used sales

<b>NAICS code and industry</b>	<b>Industry description</b>	<b>Reuse activity</b>
522298 All Other Nondepository Credit Intermediation (includes pawn shops)	Providing nondepository credit (except credit card issuing, sales financing, consumer lending, real estate credit, international trade financing, and secondary market financing). Examples of types of lending in this industry are: short-term inventory credit, agricultural lending (except real estate and sales financing) and consumer cash lending secured by personal property.	Used sales
532120 Truck, Utility Trailer, and Recreational Vehicle Rental and Leasing	Renting or leasing, without drivers, one or more of the following: trucks, truck tractors, buses, semitrailers, utility trailers, or RVs (recreational vehicles).	Rental
532210 Consumer electronics & appliances rental	Renting consumer electronics equipment and appliances, such as televisions, stereos, and refrigerators. Included in this industry are appliance rental centers.	Rental
532220 Formal wear & costume rental	Renting clothing, such as formal wear, costumes (e.g., theatrical), or other clothing (except laundered uniforms and work apparel).	Rental
532230 Video tape & disc rental	Renting prerecorded video tapes and discs for home electronic equipment.	Rental
532291 Home health equipment rental	Renting home-type health and invalid equipment, such as wheel chairs, hospital beds, oxygen tanks, walkers, and crutches.	Rental
532292 Recreational goods rental	Renting recreational goods, such as bicycles, canoes, motorcycles, skis, sailboats, beach chairs, and beach umbrellas.	Rental
532299 All other consumer goods rental	Renting consumer goods and products (except consumer electronics and appliances; formal wear and costumes; prerecorded video tapes and discs for home electronic equipment; home health furniture and equipment; and recreational goods). Included in this industry are furniture rental centers and party rental supply centers.	Rental
532310 General rental centers	Renting a range of consumer, commercial, and industrial equipment. Establishments in this industry typically operate from conveniently located facilities where they maintain inventories of goods and equipment that they rent for short periods of time. The type of equipment that establishments in this industry provide often includes, but is not limited to: audio visual equipment, contractors and builders' tools and equipment, home repair tools, lawn and garden equipment, moving equipment and supplies, and party and banquet equipment and supplies.	Rental
532420 Office machinery & equipment rental	Renting or leasing office machinery and equipment, such as computers, office furniture, duplicating machines (i.e., copiers), or facsimile machines.	Rental

<b>NAICS code and industry</b>	<b>Industry description</b>	<b>Reuse activity</b>
532490 Other machinery & equipment rental	Renting or leasing nonconsumer-type machinery and equipment (except heavy construction, transportation, mining, and forestry machinery and equipment without operators; and office machinery and equipment). Establishments in this industry rent or lease products, such as manufacturing equipment; metalworking, telecommunications, motion picture, or theatrical machinery and equipment; institutional (i.e., public building) furniture, such as furniture for schools, theaters, or buildings; or agricultural equipment without operators.	Rental
811111 General automotive repair	(1) A wide range of mechanical and electrical repair and maintenance services for automotive vehicles, such as passenger cars, trucks, and vans, and all trailers or (2) engine repair and replacement.	Repair
811112 Automotive exhaust system repair	Replacing or repairing exhaust systems of automotive vehicles, such as passenger cars, trucks, and vans.	Repair
811113 Automotive transmission repair	Replacing or repairing transmissions of automotive vehicles, such as passenger cars, trucks, and vans.	Repair
811118 Other automotive mech. & elec. repair	Specialized mechanical or electrical repair and maintenance services (except engine repair and replacement, exhaust systems repair, and transmission repair) for automotive vehicles, such as passenger cars, trucks, and vans, and all trailers.	Repair
811121 Automotive body, paint, & interior repair	Repairing or customizing automotive vehicles, such as passenger cars, trucks, and vans, and all trailer bodies and interiors; and/or painting automotive vehicles and trailer bodies.	Repair
811122 Automotive glass replacement shops	Replacing, repairing, and/or tinting automotive vehicle, such as passenger car, truck, and van, glass.	Repair
811198 All other automotive repair	Automotive repair and maintenance services (except mechanical and electrical repair and maintenance; body, paint, interior, and glass repair; motor oil change and lubrication; and car washing) for automotive vehicles, such as passenger cars, trucks, and vans, and all trailers.	Repair
811211 Consumer electronics repair	Repairing and maintaining consumer electronics, such as televisions, stereos, speakers, video recorders, CD players, radios, and cameras, without retailing new consumer electronics.	Repair
811212 Computer & office machine repair	Repairing and maintaining computers and office machines without retailing new computers and office machines, such as photocopying machines; computer terminals, storage devices, and printers; and CD-ROM drives.	Repair



<b>NAICS code and industry</b>	<b>Industry description</b>	<b>Reuse activity</b>
811213 Communication equipment repair	Repairing and maintaining communications equipment without retailing new communication equipment, such as telephones, fax machines, communications transmission equipment, and two-way radios.	Repair
811219 Other electronic & precision equip. repair	Repairing and maintaining (without retailing) electronic and precision equipment (except consumer electronics, computers and office machines, and communications equipment), such as medical diagnostic imaging equipment, measuring and surveying instruments, laboratory instruments, and radar and sonar equipment.	Repair
811310 Commercial machinery repair	Sharpen/install commercial and industrial machinery blades and saws or provide welding (e.g., automotive, general) repair services; or repair agricultural and other heavy and industrial machinery and equipment (e.g., forklifts and other materials handling equipment, machine tools, commercial refrigeration equipment, construction equipment, and mining machinery).	Repair
811411 Home & garden equipment repair	Repairing and servicing home and garden equipment without retailing new home and garden equipment, such as lawnmowers, handheld power tools, edgers, snow- and leaf-blowers, and trimmers.	Repair
811412 Appliance repair	Repairing and servicing household appliances without retailing new appliances, such as refrigerators, stoves, washing machines, clothes dryers, and room air-conditioners.	Repair
811420 Reupholstery & furniture repair	(1) Reupholstering furniture; (2) refinishing furniture; (3) repairing furniture; and (4) repairing and restoring furniture.	Repair
811430 Footwear & leather goods repair	Repairing footwear and/or repairing other leather or leather-like goods without retailing new footwear and leather or leather-like goods, such as handbags and briefcases.	Repair
811490 Other personal & household goods repair	Repairing and servicing personal or household-type goods without retailing new personal or household-type goods (except home and garden equipment, appliances, furniture, and footwear and leather goods), such as garments; watches; jewelry; musical instruments; bicycles and motorcycles; motorboats, canoes, sailboats, and other recreational boats.	Repair

Industry descriptions copied from <http://www.census.gov/cgi-bin/sssd/naics/naicsrch?chart=2007>.

## C: Online-Exchange Research

Management Analysis & Development searched four Twin Cities online exchanges to determine the number, type and average price of listed items. The searches were non-random during a narrow time period, so the results are not representative.

Table 20. All postings on Twin Cities eBay Classifieds (sorted by highest postings)

Category	Postings	Percent	Category	Number	Percent
Cars, trucks, vans	455	16%	Tools	50	2%
Other motor vehicles	397	14%	Everything else	49	2%
Furniture	258	9%	Farm equipment	43	2%
Collectibles	247	9%	Musical instruments	42	1%
Auto parts & tires	188	7%	Toys & games	35	1%
Antiques	161	6%	Health & beauty	30	1%
Home decor	116	4%	Appliances	29	1%
Clothing & accessories	84	3%	Video gaming	28	1%
Arts & crafts	79	3%	Jewelry & watches	24	1%
Business & industrial	79	3%	Books & magazines	18	1%
Sporting goods	72	3%	Bicycles	17	1%
Computers & tech	69	2%	Cell phones	15	1%
Outdoor & garden	63	2%	Tickets	14	<1%
Electronics	58	2%	Photo & video	13	<1%
Boats	52	2%	Movies & music	12	<1%
Baby & kid stuff	50	2%	<b>Total</b>	<b>2,847</b>	<b>100%</b>

Source: <http://minneapolisstpaul.ebayclassifieds.com/for-sale/?catId=100010&output=gallery>. All postings are listed regardless of date posted. The search was conducted on October 17 and 18, 2011. Almost half of non-vehicle items are priced under \$100 and three-quarters are under \$500. One-third of cars were priced between \$1,000 and \$4,000 and one quarter between \$4,000 and \$10,000.

Table 21. One week's postings on Twin Cities Free Market (sorted by highest postings)

Category	Postings	Percent	Category	Number	Percent
Furniture	36	27%	Recreation & exercise	8	6%
Home Renovation	15	11%	Appliances	7	5%
Lawn & garden	15	11%	Arts and Crafts	4	3%
Miscellaneous	13	10%	Children's	4	3%
Home Décor	12	9%	Musical Instruments	4	3%
Electronics	11	8%	Pet Equipment	2	2%
			<b>Total</b>	<b>131</b>	<b>100%</b>

Source: <http://www.twincitiesfreemarket.org/search.cfm?location=search>. All postings from October 17 through October 23, 2011. Search conducted on October 24, 2011. Some items posted during this time period may have been exchanged before October 24. The Free Market does not list motor vehicles.

Minnesota's 76 Freecycle groups are at <http://www.freecycle.org/group/US/Minnesota>. The most active ones are Minneapolis (156 offered and wanted items posted from October 17 through October 23, 2011); St. Paul (71 postings), Rochester (128 postings) and Duluth (139).

Table 22. One day's postings on Twin Cities Craigslist (sorted by highest postings)

Category	Postings	Percent	Average Price	Median Price
Furniture by owner	1,900	9%	\$200	\$95
Cars & trucks by owner	1,704	8%	\$6,200	\$3,750
Auto parts	1,666	8%	\$267	\$100
General	1,499	7%	\$553	\$50
Baby & kids	1,478	7%	\$32	\$15
Household	1,041	5%	\$89	\$25
Sporting	1,019	5%	\$228	\$75
Electronics	909	4%	\$168	\$75
Clothes & accessories	859	4%	\$63	\$30
Collectibles	710	3%	\$123	\$35
Farm & garden	701	3%	\$1,585	\$250
Cell phones	683	3%	\$312	\$180
RVs & motor sports	661	3%	\$4,086	\$1,650
Appliances	570	3%	\$285	\$158
Computer	528	3%	\$218	\$75
Business equipment	522	3%	\$4,900	\$275
Tools	504	2%	\$655	\$100
Antiques	466	2%	\$223	\$80
Music instruments	369	2%	\$463	\$199
Bikes	345	2%	\$182	\$80
Motorcycles by owner	332	2%	\$2,807	\$1,200
Boats	309	1%	\$4,745	\$900
Toys & games	265	1%	\$107	\$25
Materials	250	1%	\$369	\$50
Arts & crafts	233	1%	\$132	\$25
Video gaming	227	1%	\$97	\$45
Beauty & health	182	1%	\$367	\$120
Free	143	1%		
Books	141	1%	\$53	\$15
Jewelry	141	1%	\$874	\$75
Barter	140	1%		
CDs/DVD/VHS	109	1%	\$24	\$15
Photo & video	97	<1%	\$214	\$93
<b>Total</b>	<b>20,703</b>	<b>100%</b>		

Source: <http://minneapolis.craigslist.org/sss/> (covering the eleven county Twin Cities Metro Area and western Wisconsin). Number posted excludes dealer furniture and motor vehicle listings. Posting dates were October 17, 19, and 20, 2011 (different categories were search on different days) and the searches were conducted the immediate day after the posting date. Many "General" category items would fit into the other top categories.

## D: Job Projections and Economic Activity

MPCA staff entered the reuse sector's estimated direct jobs into the REMI Policy Insight 2 region-economic modeling software program to estimate the number of indirect and induced jobs resulting from reuse sector employment and spending activity (Table 23). The REMI model also estimates wage and salary amounts, state and local tax revenue, the reuse sector's value added to Minnesota's gross domestic product, and total gross sales. The job estimates do not predict net changes if the reuse sector grows or shrinks.

Table 23. Economic activity associated with Minnesota's reuse sector

<b>Economic activity</b>	<b>Twin Cities Metro</b>	<b>Greater Minnesota</b>	<b>Minnesota</b>
Estimated direct reuse-sector jobs <sup>39</sup>	23,270	22,570	45,840
Estimated indirect jobs <sup>40</sup>	2,489	2,155	4,644
Estimated induced jobs <sup>41</sup>	3,170	5,160	8,330
Total estimated jobs (direct, indirect, induced)	28,929	29,885	58,814
Total estimated wages and salaries	\$618 million	\$534 million	\$1.15 billion
Total estimated tax revenue on direct jobs <sup>42</sup>	\$78 million	\$81 million	\$159 million
Total estimated value-added activity <sup>43</sup>	\$900 million	\$559 million	\$1.46 billion
Total estimated gross sales (not the sum of wages, tax revenues and value added activity)	\$1.44 billion	\$902 million	\$2.34 billion

Source: Regional Economic Models, Inc. (REMI) Minnesota Forecasting and Simulation Model. Run generated on October 31, 2011 by Minnesota Pollution Control Agency staff. Twin Cities Metro and Greater Minnesota dollar amounts do not equal the state total due to the model's rounding method.

A second MPCA model run attributed an additional \$300 million in consumer spending to the reuse sector due to savings from buying used merchandise rather than new items (Table 24). This second model assumed that:

- Used retail merchandise sales are \$100 million annually (Table 2, page 6).
- Used merchandise prices are 25 percent of new retail prices (MPCA staff telephone calls to several stores).
- Consumers saved \$300 million by buying used rather than new items (the \$100 million of used items would have cost \$400 million new).
- Consumers spend or save the \$300 million in the same manner as all other consumer spending and savings (the \$300 million is allocated across all Minnesota sectors in the same proportion as total consumer spending).
- Consumers can choose between buying used and buying new (their incomes would have allowed them to buy a new item instead of a used one).

<sup>39</sup> See Table 2, page 6.

<sup>40</sup> Impacts on the reuse sector's local suppliers, unadjusted for displacement effects.

<sup>41</sup> Jobs connected to the personal income and consumer spending of the direct and indirect jobs.

<sup>42</sup> Business/personal state income taxes, sales tax, excise tax and miscellaneous taxes, and business taxes.

<sup>43</sup> The reuse sector's contribution to gross domestic product (primarily compensation and profit).

The second model does not assume that Minnesota's economy expanded by an extra \$300 million; it attributes \$300 million of existing spending and savings to the reuse sector's presence because consumers could choose used or new. The model estimates that another 2,600 existing indirect and induced Minnesota jobs should be counted as part of the reuse sector's economic activity rather than as part of the new retail sector's economic activity.

Table 24. Economic activity generated by \$300 million  
in consumer spending

<b>Economic activity</b>	<b>Increase in Table 24 total</b>
Estimated direct reuse-sector jobs	0
Estimated indirect jobs	403
Estimated induced jobs	2,154
Total estimated jobs (direct, indirect, induced)	2,557
Total estimated wages and salaries	\$80 million
Total estimated tax revenue on direct jobs	\$21 million
Total estimated value-added activity	\$200 million
Total estimated gross sales (not the sum of wages, tax revenues and value added activity)	\$320 million

Source: Regional Economic Models, Inc. (REMI) Minnesota Forecasting and Simulation Model. Run generated on November 21, 2011 by Minnesota Pollution Control Agency staff.

The second model did not attribute additional spending due to people's repair and rental expenditures or used vehicle purchases because of the difficulty in estimating how much these reuse activities save the consumer. This model is meant to illustrate another way of thinking about the reuse sector's economic activity rather than present a reliable estimate.