

US EPA ARCHIVE DOCUMENT

MSW Residential/Commercial Percentage Allocation – Data Availability  
U.S. Environmental Protection Agency  
Office of Resource Conservation and Recovery  
July 2013

---

### ***Background***

The contractor was tasked to collect and analyze available data to classify MSW products into residential and commercial fractions similar to the allocations shown in EPA's "Characterization of Municipal Solid Waste in the United States: 1998 Update" Appendix D.

The 1998 allocations were made by EPA's contractor on a "best judgment" basis. The allocations based on information gathered for a 1994 report for Keep American Beautiful, was extensively reviewed by public and private sector experts in municipal solid waste management. The allocation classified MSW generation and did not include an allocation of the MSW discard stream.

This memo presents the contractor's research approach and results of the current research effort compared to the previous work.

### ***Approach***

The contractor identified statewide solid waste generation and disposal studies that distinguish between residential and commercial sources. Statewide sampling studies are judged to be most appropriate since city or county level sampling studies are more influenced by local conditions such as climatic variability, population centers, and economic activities. However, due to the lack of available generation studies we included one citywide study within this analysis.

The studies need to provide sufficient detail so waste sources and waste materials and products can be matched as closely as possible between studies. The sampling studies data must also be delineated so residential and commercial (including institutional) MSW can be separated from non-MSW waste products. For example, although construction and demolition debris could be considered part of the commercial waste stream, it is not included in EPA's definition of MSW. Many sampling studies include this waste stream.

There are numerous examples of state sampling studies conducted at the point of disposal that split MSW into the residential and commercial fractions. One challenge of using many of the studies identified was the data were frequently presented as *percent of total* for residential separate from commercial but not as *percent of material or product*. For example, the compositions of the residential and commercial fractions (e.g., 30 percent paper, 10 percent plastic) were shown separately but the allocations of individual materials or products between residential and commercial were not shown (e.g., magazines 45 percent residential and 55 percent commercial). If detailed weight data were provided, the contractor was able to calculate the material and product allocations.

After study selection, data were extracted from study tables and entered into Excel spreadsheets. Data were aligned with EPA's national characterization report materials (e.g., paper, glass, plastic) and product categories (e.g., durable goods, nondurable goods, containers and packaging).

Where identified, studies using EPA's 1998 allocation to fill data gaps were excluded from the detailed analysis. The studies used in the analysis are cited at the end of this memorandum.

### ***Observations***

The results of this analysis are shown in a series of five tables.

1. Total MSW Residential/Commercial Allocation
2. MSW Residential/Commercial Discard and Generation Allocation, by Material
3. MSW Residential/Commercial Discard Allocation, All States by Product
4. MSW Residential/Commercial Discard Allocation, by Product
5. MSW Residential/Commercial Generation Allocation, by Product

The overall observation from this analysis is that as the level of detail increases, the range of values increases. In other words, the range of values shown for total MSW (Table 1) was tighter than the range of observations by material (Table 2) which is tighter than the range of observations by product (Tables 3, 4, 5).

The ranges are so wide, in some cases, that the use of the data shown in these tables should be used with caution. The data are insufficient to develop a single residential/commercial allocation data set.

#### *Total MSW Residential/Commercial Allocation*

Table 1 shows the residential/commercial allocation of the "bottom line". Of the states shown, discards from the residential sector average 51 percent; commercial sector MSW discards average 49 percent. The ranges are 41-62 percent for residential sector and 38-59 percent for commercial sector MSW.

The bottom portion of Table 1 lists generation study results. On average, residential sector generation is 46 percent and commercial sector generation is 54 percent. The ranges are 39-54 percent for residential sector and 46-61 percent for commercial sector MSW. This compares to EPA's 1998 report estimate of 55-65 percent for residential sector and 35-45 percent for commercial sector MSW. This suggests a complete switch of sector values.

The data shown in Table 1 are more readily available than the detailed data shown in Tables 2 through 5 and could be expanded to include additional states to better define the allocation of total MSW between the residential and commercial sectors.

#### *MSW Residential/Commercial Discard and Generation Allocation, by Material*

Table 2 shows statewide allocation results for materials in MSW. The top portion shows discard allocations; the bottom portion shows generation allocations. Rubber & leather and wood exhibit the widest ranges but also have the fewest data points. Yard waste also has wide allocation ranges. This could be due to the accounting methods; yard waste brought to the sampling site by commercial landscapers (from residential yard maintenance) may be counted as commercial in some locations but as residential in others. MSW wood waste includes mostly wood from pallets which should be allocated to the commercial sector. The data in Table 2 suggests that some sampling studies include other sources of wood waste such as scrap lumber included in MSW waste loads.

The material categories where agreement between the discard data are the closest (i.e., tightest ranges) are paper, metals, and plastic. The generation allocation ranges are closest for these same materials plus textiles, food, and other.

*MSW Residential/Commercial Discard Allocation, by Product*

Due to the large number of data points when comparing allocation of MSW products, the state-by-state discard data are summarized in Table 3. The detailed state-by-state discard data are shown in Table 4. Some of the widest ranges are observed in the durable goods portion of Table 3. Similar to yard waste discussed above, this is likely due to accounting methods. For example, major appliances originate from residential sources but are mostly managed by the commercial sector. Whether these products are considered residential or commercial will vary by state.

The products where discard data ranges exhibit the most agreement are small appliances, trash bags, diapers, and HDPE bottles.

*MSW Residential/Commercial Generation Allocation, by Product*

Table 5 shows allocation of MSW generation by products. The two studies are compared side-by side with EPA's 1998 study estimates. Due to the lack of available generation studies, no trends could be identified from the limited data. For some products, the two sampling studies agree fairly well to each other but not the U.S. data (e.g., plastic bottles and containers); for other products one sampling study agrees with the U.S. data and the other one does not agree (e.g., newspapers). Office-type papers and clothing and footwear agree fairly well across all three studies.

**Table 1. Total MSW Residential/Commercial Allocation**

| <b>Discards</b>   | <b>Residential %</b> | <b>Commercial %</b> |
|-------------------|----------------------|---------------------|
| California        | 40                   | 60                  |
| Connecticut       | 58                   | 42                  |
| Illinois          | 51                   | 49                  |
| Iowa              | 53                   | 47                  |
| New York          | 54                   | 46                  |
| Oregon            | 62                   | 38                  |
| Washington        | 50                   | 50                  |
| Wisconsin         | 41                   | 59                  |
| <i>Average</i>    | <i>51</i>            | <i>49</i>           |
| <i>Range</i>      | <i>41-62</i>         | <i>38-59</i>        |
| <b>Generation</b> | <b>Residential %</b> | <b>Commercial %</b> |
| Florida           | 47                   | 53                  |
| Illinois          | 52                   | 48                  |
| Chicago, Illinois | 39                   | 61                  |
| Iowa              | 43                   | 57                  |
| Massachusetts     | 41                   | 59                  |
| New York          | 54                   | 46                  |
| <i>Average</i>    | <i>46</i>            | <i>54</i>           |
| <i>Range</i>      | <i>39-54</i>         | <i>46-61</i>        |
| <i>U.S. Range</i> | <i>55-65</i>         | <i>35-45</i>        |

U.S. EPA "Characterization of Municipal Solid Waste in the United States:  
1998 Update"

**Table 2. MSW Residential/Commercial Discard and Generation Allocation, by Material**

| <b>Materials</b>         | <b>Paper &amp; Paperboard</b> |                   | <b>Glass</b>       |                   | <b>Metals</b>      |                   | <b>Plastics</b>    |                   | <b>Rubber &amp; Leather</b> |                   |
|--------------------------|-------------------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|-----------------------------|-------------------|
| <b>Location</b>          | <b>Residential</b>            | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b>          | <b>Commercial</b> |
| <b><i>Discards</i></b>   | %                             | %                 | %                  | %                 | %                  | %                 | %                  | %                 | %                           | %                 |
| California               | 35                            | 65                | 54                 | 46                | 33                 | 67                | 31                 | 69                | 6                           | 94                |
| Connecticut              | 54                            | 46                | 62                 | 38                | 55                 | 45                | 49                 | 51                |                             |                   |
| Illinois                 | 44                            | 56                | 64                 | 36                | 51                 | 49                | 50                 | 50                | 35                          | 65                |
| Iowa                     | 41                            | 59                | 65                 | 35                | 51                 | 49                | 44                 | 56                | 35                          | 65                |
| New York                 | 56                            | 44                | 52                 | 48                | 56                 | 44                | 54                 | 46                | 57                          | 43                |
| Oregon                   | 49                            | 51                | 73                 | 27                | 55                 | 45                | 55                 | 45                | 70                          | 30                |
| Tennessee                | 44                            | 66                | 51                 | 49                | 48                 | 52                | 56                 | 44                |                             |                   |
| Washington               | 48                            | 52                | 34                 | 66                | 55                 | 45                | 47                 | 53                | 72                          | 28                |
| Wisconsin                | 35                            | 65                | 24                 | 76                | 54                 | 46                | 34                 | 66                | 1                           | 99                |
| <i>Average</i>           | 45                            | 56                | 53                 | 47                | 51                 | 49                | 47                 | 53                | 39                          | 61                |
| <i>Range</i>             | 35-56                         | 44-65             | 24-73              | 27-76             | 33-56              | 44-67             | 31-56              | 44-69             | 1-72                        | 28-99             |
| <b><i>Generation</i></b> |                               |                   |                    |                   |                    |                   |                    |                   |                             |                   |
| New York                 | 53                            | 47                | 56                 | 44                | 56                 | 44                | 55                 | 45                | 59                          | 41                |
| Illinois                 | 40                            | 60                | 65                 | 35                | 57                 | 43                | 60                 | 40                | 5                           | 95                |
| Iowa                     | 31                            | 69                | 33                 | 67                | 33                 | 67                | 42                 | 58                |                             |                   |
| Chicago                  | 30                            | 70                | 47                 | 53                | 32                 | 68                | 41                 | 59                | 39                          | 61                |
| <i>Average</i>           | 39                            | 62                | 50                 | 50                | 45                 | 56                | 50                 | 51                | 34                          | 66                |
| <i>Range</i>             | 30-53                         | 47-70             | 33-65              | 35-67             | 32-56              | 43-68             | 41-60              | 40-59             | 5-59                        | 41-95             |

July 2013  
Page 6 of 11

**Table 2. MSW Residential/Commercial Discard and Generation Allocation, by Material (continued)**

| <b>Materials</b>         | <b>Textiles</b>    |                   | <b>Wood</b>        |                   | <b>Food</b>        |                   | <b>Yard Waste</b>  |                   | <b>Other</b>       |                   |
|--------------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|--------------------|-------------------|
| <b>Location</b>          | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> | <b>Residential</b> | <b>Commercial</b> |
| <b><i>Discards</i></b>   | %                  | %                 | %                  | %                 | %                  | %                 | %                  | %                 | %                  | %                 |
| California               | 61                 | 39                |                    |                   | 50                 | 50                | 45                 | 55                | 26                 | 74                |
| Connecticut              | 74                 | 26                |                    |                   | 57                 | 43                | 78                 | 22                | 54                 | 46                |
| Illinois                 | 57                 | 43                | 7                  | 93                | 53                 | 47                | 53                 | 47                | 59                 | 41                |
| Iowa                     | 69                 | 31                |                    |                   | 80                 | 20                | 51                 | 49                | 60                 | 40                |
| New York                 | 54                 | 46                | 46                 | 54                | 48                 | 52                | 63                 | 37                | 50                 | 50                |
| Oregon                   | 63                 | 37                | 19                 | 81                | 67                 | 33                | 79                 | 21                | 64                 | 36                |
| Tennessee                | 49                 | 51                |                    |                   | 65                 | 35                | 52                 | 48                | 50                 | 50                |
| Washington               | 65                 | 35                |                    |                   | 46                 | 54                | 90                 | 10                | 50                 | 50                |
| Wisconsin                | 38                 | 62                | 9                  | 91                | 51                 | 49                | 60                 | 40                | 50                 | 50                |
| <i>Average</i>           | 59                 | 41                | 20                 | 80                | 57                 | 43                | 63                 | 37                | 51                 | 49                |
| <i>Range</i>             | 38-74              | 26-62             | 7-46               | 54-93             | 46-80              | 20-54             | 45-90              | 10-55             | 26-64              | 36-74             |
| <b><i>Generation</i></b> |                    |                   |                    |                   |                    |                   |                    |                   |                    |                   |
| New York                 | 65                 | 35                | 41                 | 59                | 46                 | 54                | 66                 | 34                | 51                 | 49                |
| Illinois                 | 56                 | 44                | 8                  | 92                | 50                 | 50                | 54                 | 46                | 49                 | 51                |
| Iowa                     |                    |                   | 41                 | 59                | 51                 | 49                | 80                 | 20                | 60                 | 40                |
| Chicago                  | 49                 | 51                | 2                  | 98                | 40                 | 60                | 53                 | 47                | 58                 | 42                |
| <i>Average</i>           | 57                 | 43                | 23                 | 77                | 47                 | 53                | 63                 | 37                | 55                 | 46                |
| <i>Range</i>             | 49-65              | 35-51             | 2-41               | 59-98             | 40-51              | 49-60             | 53-80              | 20-47             | 49-60              | 40-51             |

**Table 3. MSW Residential/Commercial Discard Allocation, All States**

|                                | Residential Range |     | Commercial Range |     |
|--------------------------------|-------------------|-----|------------------|-----|
|                                | %                 |     | %                |     |
| Durable Goods                  |                   |     |                  |     |
| Major Appliances               | 0                 | 99  | 1                | 100 |
| Small Appliances               | 46                | 56  | 44               | 54  |
| Furniture & Furnishings        | 3                 | 81  | 19               | 97  |
| Carpets & Rugs                 | 12                | 71  | 29               | 88  |
| Rubber Tires                   | 1                 | 72  | 28               | 99  |
| Batteries, Lead-Acid           | 0                 | 100 | 0                | 100 |
| Selected Consumer Electronics  | 45                | 77  | 23               | 55  |
| Bulky Items*                   | 49                | 66  | 34               | 51  |
| Other Miscellaneous Durables   | 26                | 49  | 51               | 74  |
| Nondurable Goods               |                   |     |                  |     |
| Newspapers/Mechanical Papers   | 34                | 75  | 25               | 66  |
| Magazines                      | 43                | 71  | 29               | 57  |
| Office-Type Papers             | 25                | 47  | 53               | 75  |
| Trash Bags                     | 31                | 48  | 52               | 69  |
| Disposable Diapers             | 58                | 79  | 21               | 42  |
| Other Nonpackaging Paper       | 39                | 73  | 27               | 61  |
| Clothing & Footwear            | 38                | 82  | 18               | 62  |
| Textiles*                      | 49                | 78  | 22               | 51  |
| Containers & Packaging         |                   |     |                  |     |
| Glass Packaging                | 24                | 77  | 23               | 76  |
| Steel Packaging                | 50                | 80  | 20               | 50  |
| Aluminum Packaging             | 50                | 75  | 25               | 50  |
| Paper & Paperboard Packaging   | 20                | 56  | 44               | 80  |
| Corrugated Boxes               | 18                | 52  | 48               | 82  |
| Plastics Packaging             | 34                | 73  | 27               | 66  |
| PET Bottles and Jars           | 48                | 77  | 23               | 52  |
| HDPE Natural Bottles           | 49                | 66  | 34               | 51  |
| Other Containers               | 41                | 74  | 26               | 59  |
| Bags & Sacks and Wraps         | 31                | 72  | 28               | 69  |
| Other Plastics Packaging       | 10                | 71  | 29               | 90  |
| Wood Packaging                 | 7                 | 46  | 54               | 93  |
| Other Wastes                   |                   |     |                  |     |
| Food Wastes                    | 46                | 73  | 27               | 54  |
| Yard Wastes                    | 45                | 90  | 10               | 55  |
| Miscellaneous Inorganic Wastes | 48                | 66  | 34               | 52  |



**Table 4. MSW Residential/Commercial Discard Allocation, by Product**

| Product                           | California       |                 | Conencticut      |                 | Illinois         |                 | Iowa             |                 | Massachusetts    |                 |
|-----------------------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
|                                   | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% |
| <b>Durable Goods</b>              |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Major Appliances                  | 0                | 100             | 73               | 27              | 0                | 100             |                  |                 | 11               | 89              |
| Small Appliances                  |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Furniture & Furnishings           | 22               | 78              |                  |                 |                  |                 |                  |                 |                  |                 |
| Carpets & Rugs                    | 25               | 75              | 64               | 36              | 66               | 34              |                  |                 | 71               | 29              |
| Rubber Tires                      | 6                | 94              |                  |                 | 35               | 65              | 35               | 65              | 44               | 56              |
| Batteries, Lead-Acid              |                  |                 | 15               | 85              | 83               | 17              |                  |                 | 0                | 100             |
| Selected Consumer Electronics     | 52               | 48              | 53               | 47              | 52               | 48              |                  |                 | 77               | 23              |
| Bulky Items*                      |                  |                 | 49               | 51              | 66               | 34              |                  |                 | 62               | 38              |
| Other Miscellaneous Durables      | 29               | 71              | 49               | 51              |                  |                 |                  |                 |                  |                 |
| <b>Nondurable Goods</b>           |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Newspapers/Mechanical Papers      | 58               | 42              | 60               | 40              | 63               | 37              | 66               | 34              | 58               | 42              |
| Magazines                         | 55               | 45              | 57               | 43              | 71               | 29              | 51               | 49              | 64               | 36              |
| Office-Type Papers                | 34               | 66              | 35               | 65              | 47               | 53              | 25               | 75              | 29               | 71              |
| Trash Bags                        | 31               | 69              | 32               | 68              |                  |                 | 48               | 52              |                  |                 |
| Disposable Diapers                |                  |                 |                  |                 |                  |                 | 79               | 21              | 75               | 26              |
| Other Nonpackaging Paper          | 39               | 61              | 41               | 59              | 53               | 47              | 60               | 40              | 47               | 53              |
| Clothing & Footwear               |                  |                 |                  |                 |                  |                 | 64               | 36              |                  |                 |
| Textiles*                         | 61               | 39              | 64               | 36              | 74               | 26              | 53               | 48              | 69               | 31              |
| <b>Containers &amp; Packaging</b> |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Glass Packaging                   | 58               | 42              | 58               | 42              | 62               | 38              | 64               | 36              | 65               | 36              |
| Steel Packaging                   |                  |                 | 50               | 50              | 65               | 35              | 64               | 36              | 53               | 47              |
| Aluminum Packaging                |                  |                 | 56               | 44              | 50               | 50              | 62               | 39              | 75               | 25              |
| Paper & Paperboard Packaging      |                  |                 | 20               | 80              | 46               | 54              | 30               | 70              | 41               | 59              |
| Corrugated Boxes                  | 18               | 82              | 19               | 82              | 46               | 54              | 24               | 74              | 22               | 78              |
| Plastics Packaging                |                  |                 | 38               | 62              | 51               | 49              | 50               | 50              | 44               | 56              |
| PET Bottles and Jars              | 54               | 46              | 54               | 46              | 48               | 52              | 55               | 45              | 53               | 47              |
| HDPE Natural Bottles              | 51               | 49              | 52               | 49              | 57               | 43              | 54               | 46              | 56               | 44              |
| Other Containers                  | 47               | 53              | 47               | 53              | 42               | 58              | 54               | 46              | 41               | 59              |
| Bags & Sacks and Wraps            | 31               | 69              | 34               | 66              | 61               | 39              | 40               | 60              | 55               | 45              |
| Other Plastics Packaging          |                  |                 |                  |                 |                  |                 | 57               | 43              | 43               | 57              |
| Wood Packaging                    |                  |                 |                  |                 | 7                | 93              |                  |                 |                  |                 |
| <b>Other Wastes</b>               |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Food Wastes                       | 50               | 50              | 50               | 50              | 57               | 43              | 53               | 47              | 51               | 49              |
| Yard Wastes                       | 45               | 55              | 50               | 50              | 78               | 22              | 53               | 47              | 80               | 20              |
| Miscellaneous Inorganic Wastes    |                  |                 |                  |                 |                  |                 | 55               | 45              | 48               | 52              |

\*Product detail not provided

**Table 4. MSW Residential/Commercial Discard Allocation, by Product (continued)**

| Product                           | New York         |                 | Oregon           |                 | Tennessee        |                 | Washington       |                 | Wisconsin        |                 |
|-----------------------------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|------------------|-----------------|
|                                   | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% | Residential<br>% | Commercial<br>% |
| <b>Durable Goods</b>              |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Major Appliances                  |                  |                 | 38               | 62              |                  |                 | 99               | 1               | 37               | 63              |
| Small Appliances                  |                  |                 | 56               | 44              |                  |                 |                  |                 | 46               | 54              |
| Furniture & Furnishings           |                  |                 | 81               | 19              |                  |                 | 3                | 97              | 38               | 62              |
| Carpets & Rugs                    | 54               | 46              | 64               | 36              |                  |                 | 12               | 88              | 49               | 51              |
| Rubber Tires                      | 57               | 43              | 72               | 28              |                  |                 | 6                | 94              | 1                | 99              |
| Batteries, Lead-Acid              |                  |                 | 100              | 0               |                  |                 | 0                | 100             | 0                | 100             |
| Selected Consumer Electronics     | 53               | 47              | 47               | 53              | 45               | 55              | 58               | 42              | 75               | 25              |
| Bulky Items*                      |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Other Miscellaneous Durables      |                  |                 |                  |                 |                  |                 | 26               | 74              | 31               | 69              |
| <b>Nondurable Goods</b>           |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Newspapers/Mechanical Papers      | 75               | 25              | 42               | 58              | 34               | 66              | 62               | 38              | 61               | 39              |
| Magazines                         | 68               | 32              | 61               | 39              | 43               | 57              | 59               | 41              | 62               | 38              |
| Office-Type Papers                | 30               | 70              | 30               | 70              | 30               | 70              |                  |                 | 33               | 67              |
| Trash Bags                        |                  |                 |                  |                 |                  |                 | 39               | 61              |                  |                 |
| Disposable Diapers                |                  |                 | 65               | 35              | 73               | 27              | 77               | 23              | 58               | 42              |
| Other Nonpackaging Paper          | 73               | 27              |                  |                 | 39               | 61              | 48               | 52              |                  |                 |
| Clothing & Footwear               |                  |                 | 54               | 46              |                  |                 | 82               | 18              | 38               | 62              |
| Textiles*                         | 78               | 22              |                  |                 | 49               | 51              | 65               | 35              |                  |                 |
| <b>Containers &amp; Packaging</b> |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Glass Packaging                   | 77               | 23              | 53               | 48              | 51               | 49              | 65               | 35              | 24               | 76              |
| Steel Packaging                   | 80               | 20              | 52               | 48              | 65               | 35              | 57               | 43              | 54               | 46              |
| Aluminum Packaging                | 66               | 34              | 64               | 36              | 54               | 46              | 56               | 44              | 52               | 48              |
| Paper & Paperboard Packaging      | 40               | 60              | 56               | 44              | 44               | 56              | 38               | 62              | 35               | 65              |
| Corrugated Boxes                  | 39               | 61              | 46               | 54              | 52               | 48              |                  |                 | 37               | 52              |
| Plastics Packaging                | 73               | 27              | 58               | 42              | 56               | 44              | 49               | 51              | 34               | 66              |
| PET Bottles and Jars              | 77               | 23              | 56               | 44              | 65               | 35              | 64               | 36              | 48               | 52              |
| HDPE Natural Bottles              | 66               | 34              | 61               | 39              |                  |                 | 49               | 51              | 52               | 48              |
| Other Containers                  | 74               | 26              | 57               | 43              | 60               | 40              | 63               | 37              | 61               | 39              |
| Bags & Sacks and Wraps            | 72               | 28              | 52               | 48              | 49               | 51              | 47               | 53              | 58               | 42              |
| Other Plastics Packaging          | 53               | 47              | 58               | 42              | 71               | 29              | 10               | 90              | 32               | 68              |
| Wood Packaging                    | 46               | 54              | 19               | 81              |                  |                 |                  |                 | 9                | 91              |
| <b>Other Wastes</b>               |                  |                 |                  |                 |                  |                 |                  |                 |                  |                 |
| Food Wastes                       | 73               | 27              | 48               | 52              | 65               | 35              | 46               | 54              | 51               | 49              |
| Yard Wastes                       | 77               | 23              | 63               | 37              | 52               | 48              | 90               | 10              | 60               | 40              |
| Miscellaneous Inorganic Wastes    | 66               | 34              | 53               | 47              | 50               | 50              |                  |                 |                  |                 |

\*Product detail not provided

**Table 5. MSW Residential/Commercial Generation Allocation, by Product**

| Product                           | New York    |            | Chicago     |            | EPA U.S. 1998 |            |
|-----------------------------------|-------------|------------|-------------|------------|---------------|------------|
|                                   | Residential | Commercial | Residential | Commercial | Residential   | Commercial |
|                                   | %           | %          | %           | %          | %             | %          |
| <b>Durable Goods</b>              |             |            |             |            |               |            |
| Major Appliances                  |             |            | 0           | 100        | 10            | 90         |
| Carpets & Rugs                    | 64          | 37         | 30          | 70         | 80            | 20         |
| Rubber Tires                      | 59          | 41         | 39          | 61         | 5             | 95         |
| Batteries, Lead-Acid              | 64          | 36         | 97          | 3          | 5             | 95         |
| Selected Consumer Electronics     | 53          | 47         | 44          | 56         |               |            |
| Bulky Items*                      |             |            | 35          | 65         |               |            |
| Other Miscellaneous Durables      | 58          | 42         | 32          | 68         | 80            | 20         |
| <b>Nondurable Goods</b>           |             |            |             |            |               |            |
| Newspapers/Mechanical Papers      | 78          | 22         | 46          | 54         | 85            | 15         |
| Books                             | 64          | 36         |             |            | 80            | 20         |
| Magazines                         | 57          | 43         | 40          | 60         | 65            | 35         |
| Office-Type Papers                | 19          | 81         | 12          | 88         | 25            | 75         |
| Standard Mail                     | 85          | 15         |             |            | 65            | 35         |
| Commercial Printing               | 49          | 52         |             |            | 65            | 35         |
| Trash Bags                        |             |            | 36          | 64         | 95            | 5          |
| Disposable Diapers                | 69          | 31         | 75          | 25         | 90            | 10         |
| Clothing & Footwear               | 66          | 34         | 59          | 41         | 60            | 40         |
| Textiles*                         |             |            | 40          | 60         |               |            |
| <b>Containers &amp; Packaging</b> |             |            |             |            |               |            |
| Glass Packaging                   | 56          | 44         | 47          | 53         | 80            | 20         |
| Steel Packaging                   | 69          | 31         | 48          | 52         | 80            | 20         |
| Aluminum Packaging                | 64          | 36         | 25          | 75         | 80            | 20         |
| Paper & Paperboard Packaging      | 53          | 47         | 31          | 69         |               |            |
| Corrugated Boxes                  | 36          | 64         | 16          | 84         | 10            | 90         |
| Gable Top/Aseptic Cartons         |             |            | 26          | 74         | 50            | 50         |
| Other Paperboard Packaging        | 81          | 19         | 52          | 48         | 50            | 50         |
| Bags & Sacks                      | 76          | 24         |             |            | 90            | 10         |
| Other Paper Packaging             | 58          | 42         | 43          | 57         | 70            | 30         |
| Plastics Packaging                | 55          | 45         | 41          | 59         |               |            |
| PET Bottles and Jars              | 58          | 42         | 54          | 46         | 80            | 20         |
| HDPE Natural Bottles              | 63          | 37         | 50          | 50         | 95            | 5          |
| Other Containers                  | 56          | 44         | 43          | 57         | 80            | 20         |
| Bags & Sacks and Wraps            | 53          | 47         | 42          | 58         | 90            | 10         |
| Other Plastics Packaging          | 61          | 39         |             |            | 80            | 20         |
| Wood Packaging                    | 41          | 59         | 2           | 98         | 0             | 100        |
| <b>Other Wastes</b>               |             |            |             |            |               |            |
| Food Wastes                       | 46          | 54         | 40          | 60         | 50            | 50         |
| Yard Wastes                       | 66          | 34         | 53          | 47         | 90            | 10         |
| Miscellaneous Inorganic Wastes    | 52          | 48         | 54          | 46         | 50            | 50         |
| <i>Total MSW Generation</i>       | <i>54</i>   | <i>46</i>  | <i>39</i>   | <i>61</i>  | <i>57</i>     | <i>43</i>  |

\*Product detail not provided

## *References*

California Department of Resources Recycling and Recovery (CalRecycle). "California 2008 Statewide Waste Characterization Study". August 2009.

<http://www.calrecycle.ca.gov/wastechar/wastestudies.htm#2008Study>

Connecticut Department of Environmental Protection. "Connecticut State-wide Solid Waste Composition and Characterization Study, Final Report". May 26, 2010.

[http://www.ct.gov/deep/lib/deep/waste\\_management\\_and\\_disposal/solid\\_waste/wastecharstudy/ctcompositioncharstudymay2010.pdf](http://www.ct.gov/deep/lib/deep/waste_management_and_disposal/solid_waste/wastecharstudy/ctcompositioncharstudymay2010.pdf)

Illinois Recycling Association. "Illinois Commodity/Waste Generation and Characterization Study". May 22, 2009. <http://www2.illinois.gov/gov/green/Documents/Waste%20Study.pdf>

Iowa Department of Natural Resources. "2011 Iowa Statewide Waste Characterization Study, Final Report". September 14, 2011.

<http://www.iowadnr.gov/Portals/idnr/uploads/waste/wastecharacterization2011.pdf>

Commonwealth of Massachusetts. Department of Environmental Protection. "2008 Solid Waste Data Update on the Beyond 2000 Solid Waste Master Plan". April 2010.

<http://www.mass.gov/dep/recycle/priorities/08swdata.pdf>

New York Department of Environmental Conservation. "Beyond Waste: A Sustainable Material Management Strategy" Appendix H. December 27, 2010. <http://www.dec.ny.gov/chemical/41831.html>

Oregon Department of Environmental Quality. Oregon Statewide Waste Composition 2009: Statewide Results spread sheet. <http://www.deq.state.or.us/lq/sw/disposal/wastecompstudy2009.htm>

Tennessee Department of Environment and Conservation. "2008 Tennessee Waste Characterization Study". December 15, 2008. <http://www.tn.gov/environment/swm/pdf/swspfin1.pdf>

Washington State Department of Ecology. "2009 Washington Statewide Waste Characterization Study". June 25, 2010. <https://fortress.wa.gov/ecy/publications/publications/1007023.pdf>

Wisconsin Department of Natural Resources. "2009 Wisconsin State-Wide Waste Characterization Study, Final Report". June 30, 2010. <http://dnr.wi.gov/topic/Recycling/studies.html>

City of Chicago. Department of Environment. "Waste Characterization Study". April 2, 2010. [http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt\\_PDFs/WasteAndDiversionStudy/WasteCharacterizationReport.pdf](http://www.cityofchicago.org/dam/city/depts/doe/general/RecyclingAndWasteMgmt_PDFs/WasteAndDiversionStudy/WasteCharacterizationReport.pdf)

Florida Department of Environmental Protection. Bureau of Solid & Hazardous Waste. "Solid Waste Management in Florida 2010 Annual Report".

[http://www.dep.state.fl.us/waste/categories/recycling/SWreportdata/10\\_data.htm](http://www.dep.state.fl.us/waste/categories/recycling/SWreportdata/10_data.htm)

U.S. Environmental Protection Agency. "Characterization of Municipal Solid Waste in the United States: 1998 Update". July 1999. <http://www.epa.gov/osw/nonhaz/municipal/msw99.htm>