

# Market Assessment for Recyclable Materials in King County: Executive Summary

September 2006

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This document presents a summary of the results of King County Solid Waste Division's 2006 market assessment for recyclable materials generated in King County, completed by Cascadia Consulting Group. The goal of this assessment was to help King County and the cities identify opportunities, establish priorities, and guide programs for market development and increased diversion of recyclable materials from the waste stream. The full report and this summary were completed in September 2006. This executive summary presents:

- Key market findings (page 1);
- An overview of the supply of each material in King County (page 3); and
- Opportunities for public sector action to support, maintain, and expand markets for recyclables generated in the county (page 3).

Additionally, a brief summary of the current status of the supply chain for each material is found beginning on page 7. Materials included in the assessment are electronics, glass, plastics, metals, organics, paper, wood, textiles, and gypsum.

## KEY MARKET FINDINGS

The local, regional, and global recycling industry has matured over the past decade. In most cases, little or no market development assistance is needed from the public sector to find markets or keep materials moving. In general, County and city efforts can focus on increasing supply, addressing quality concerns (especially if occurring at the point of generation), and helping to maximize the value of materials to increase the cost-effectiveness of recycling relative to disposal.

Key findings from the market assessment include the following:

- **Markets could easily absorb additional quantities of most materials collected from King County.** Manufacturers and other end users are demanding recycled plastic, glass, paper, organics, clean wood, electronics, and textiles in large quantities, and supply chains are well established. The exception currently in King County is gypsum wallboard, for which supply is greater than demand.
- **A ban on disposing select residential and/or business recyclables would likely provide additional supply to markets.** From a markets perspective, a disposal ban can be an effective means of increasing supply for materials where demand and prices are expected to be strong. A disposal ban could therefore support the strong and stable markets for cardboard, newspaper, mixed waste paper<sup>1</sup>, PET and HDPE bottles, and aluminum and steel food

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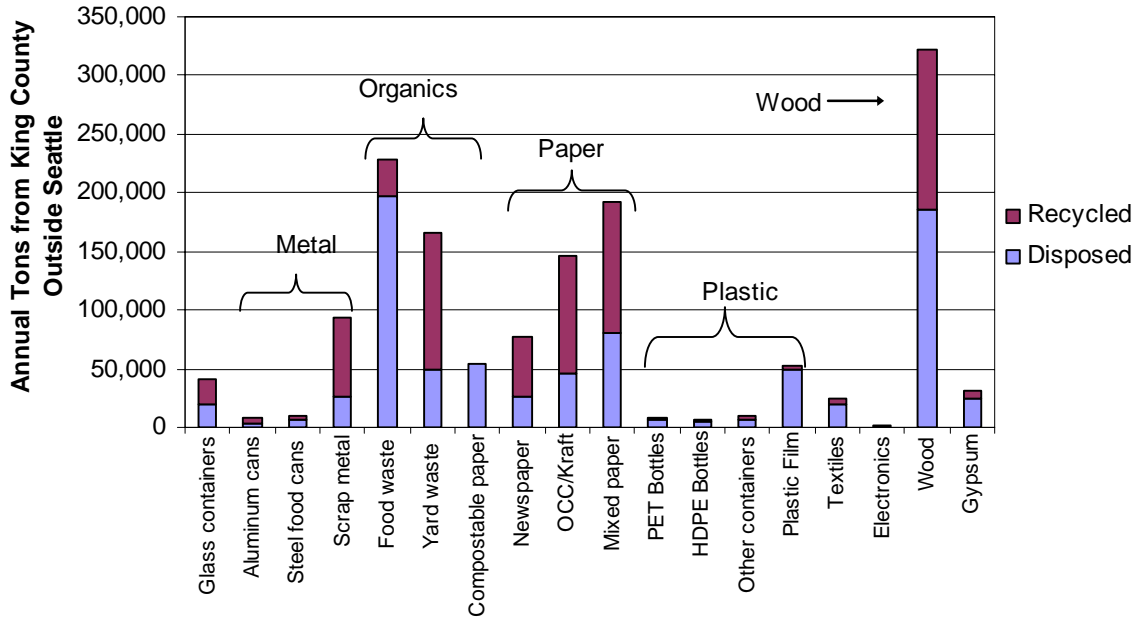
<sup>1</sup> Mixed Waste Paper is the industry term for a grade of recyclable paper that includes magazines, junk mail, and other forms of recyclable paper other than newspaper and cardboard that are often generated in homes.

cans. On the other hand, a ban may be less appropriate for materials where markets are still emerging or where long-term stability has not been demonstrated. Accordingly, a ban may not be advisable for mixed plastics (non-bottle containers and #3 through #7 plastics), where demand and prices are relatively low. Caution is also warranted for glass containers, unless local processing and marketing challenges can be resolved.

- **Glass recycling is in transition.** Even though demand for recycled glass by local bottle manufacturer Saint Gobain Containers is very high, local Material Recovery Facilities (MRFs) and processors are not able to cost-effectively supply sufficient quantity and quality of recycled glass to this market. As a result, much of the glass collected in King County is going to the lower-value construction market. Key factors that contribute to this trend include increased contamination (due in part to single-stream collection and processing), outdated equipment at Fibres (the local glass processor), and an apparent lack of cooperation between local stakeholders.
- **Asia continues to grow as a major market destination for several materials.** Asia is the dominant market for paper and plastics, is a growing consumer of metal, and is sometimes a destination for e-scrap. Contacts interviewed and the literature reviewed suggest that demand in Asia will continue to be strong for at least the next 5 to 10 years.
- **Increased recycling opportunities at transfer stations would help boost material supply to strong markets.** Yard waste and metal are disposed in significant quantities at King County transfer stations, yet both also have strong and stable markets. Transfer station upgrades to collect more of these and other recyclables with strong markets could benefit the recycling industry and support waste reduction and recycling goals.

## SUPPLY OF RECYCLABLE MATERIAL IN KING COUNTY

As shown in the figure below, King County (outside Seattle and Milton) generates more than one million tons each year of the nine major materials covered in this study: electronics, glass, plastics, metals, organics, paper, wood<sup>2</sup>, textiles, and gypsum. Of that total, over 500,000 tons are estimated to be recycled<sup>3</sup>, while more than 800,000 tons are estimated to be disposed. The quantities recycled and disposed vary considerably by material.



## OPPORTUNITIES FOR PUBLIC SECTOR ACTION

One of the primary goals of this assessment has been to help King County and cities identify opportunities and establish priorities for market development and increased diversion of recyclable materials from the waste stream. As in previous market assessments conducted for King County, the consultant assessed options and materials based on criteria concerning the need or opportunity for market intervention and the ability of King County and cities to influence the marketplace. For this study, these criteria are defined as follows:

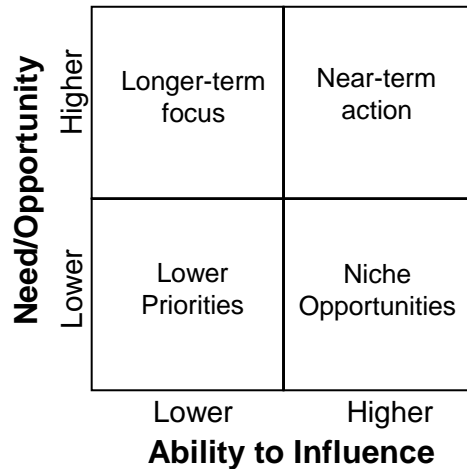
- **Need/opportunity** is a measure of the market development *needs* (such as large or toxic quantities of material being disposed or low market demand) and *opportunities* (such as the potential to create significant new value or substantially increase supply or demand).

<sup>2</sup> The wood quantity includes wood disposed at construction and demolition facilities.

<sup>3</sup> For this chart, the term “recycled” includes wood diverted for use as hog fuel, a use that in some cases is not counted as “recycling.”

- **Ability to influence** is a measure of the degree to which King County and its partners can affect the markets or supply chain for a material in the near term.

Also as in past years, a quadrant chart was used to help categorize the materials into different priority groups. Materials that rate high on both the *need/opportunity* and *ability to influence* criteria are strong candidates for near-term public sector involvement, while materials that receive lower ratings may still provide niche or long-term opportunities. The following chart depicts this chart and displays the four categories (each represented by a quadrant) used in the analysis.



### ***Near-term Action***

The following have been identified as strong candidates for near-term action by King County and its partners (presented in no particular order):

- **Maximize the potential for color-separated, bottle-to-bottle glass recycling.** King County and its partners could convene a glass “summit” and invite all stakeholders (including haulers, processors, and end users) to create solutions that increase bottle-to-bottle glass recycling in the County, including the possibility that local companies (and perhaps public sector partners) could share the cost of capital upgrades needed to market recycled glass to the bottling industry.
- **Implement a disposal ban or other strategies that will increase supply of paper, plastic bottles, and aluminum and steel cans.** The consultant’s analysis suggests that markets are strong, stable, and could support a ban for plastic bottles, aluminum and steel food cans, and recyclable paper. Markets for glass bottles and non-bottle plastic containers could also likely support increased quantities, although a ban may not be appropriate at this time due to uncertainties in the market supply chains for these materials. In addition, care should be taken to clearly define and communicate what materials are recyclable so that a ban or other strategies do not lead to increased contamination. A disposal ban could apply to residents, businesses, or both.
- **Monitor and facilitate smooth implementation of ESSB 6428, the Electronic Waste Recycling Act, in King County.** ESSB 6428 is likely to dramatically increase recycling of used electronic products in King County and throughout Washington State. Although responsibility for implementing ESSB

6428 has been assigned to manufacturers, King County can still take an active role to ensure smooth implementation for local recyclers and material generators. King County could monitor the emerging details of ESSB's implementation to determine unintended consequences, provide assistance to local recyclers, support marketing efforts, as needed, and work with the Department of Ecology and other partners to ensure that recycling of electronic material under the bill meets environmental and health standards. King County can also assist in promoting the new recycling opportunities available under the bill to residents and businesses.

- **Increase food recycling for compost.** Markets for compost are strong in King County and the region, and providing increased feedstocks to the composting industry can both divert material from the waste stream and create value. Food is still a major component of the waste stream, and King County and several cities have been leaders in providing curbside food recycling options for residents as part of the already-offered yard waste collection. Despite this improved access to curbside food collection, few residents take full advantage of the opportunity. A regional outreach campaign could be launched to increase awareness and encourage residents to participate. Cities could add foodwaste to their recycling collection programs.
- **Monitor and promote compost quality.** Monitoring local compost products for consistency and quality and publicizing results could help expand the market for higher value, high quality compost products and help encourage healthy competition. Higher-quality products are desired by many landscapers, nurseries, and home gardeners. Increased product quality could also translate into higher value, potentially increasing the cost-effectiveness of composting relative to disposal.
- **Improve supply of clean urban wood.** Significant quantities of clean urban wood remain in the waste stream and markets for the material are strong. Options under discussion by King County's Wood Markets Planning Team as of June 2006 include a disposal ban on clean urban wood, financial incentives for wood recycling, expanded space at transfer stations for recycling and reuse, and technology to neutralize CCA-treated wood.
- **Develop options for painted wood.** Few markets exist for painted and stained wood. King County could investigate potential markets for these materials, including the possibility of using painted wood as hog fuel if appropriate emissions control technologies are available and cost-effective.
- **Develop markets for gypsum.** Local manufacturers of new gypsum wallboard cannot accept any more recycled gypsum. New markets for gypsum, particularly ones that will pay for the material, are needed before gypsum recycling can reach its potential in King County. Options include assisting processors with developing the cement and acoustical ceiling tile markets for recycled gypsum and the paper backing, respectively.

### ***Niche Opportunities***

This assessment indicates that the following opportunities (presented in no particular order) have a high potential to increase the value of recyclables in the County, even if they would not necessarily substantially increase the quantity of materials being

recycled. Many of these opportunities could perhaps benefit from assistance through the King County LinkUp project.

- **High-value composts:** High-value composts are in demand by certain segments of the agriculture industry (particularly nurseries and vineyards) as well as home gardeners. Producing such higher-value composts from recycled organics in King County may be viable, particularly given the growth in food waste recovery, a high-nutrient feedstock. King County could work with the private sector to identify and develop higher-value compost products out of local feedstocks, including food waste.
- **Computer reuse:** Refurbishing and re-sale can add value to discarded computers and can help provide technology and learning opportunities to low-income and other communities in need. King County could help expand opportunities for computer refurbishing and use existing successful programs in other areas (e.g., Portland) as models.
- **Niche markets for clean urban wood:** Opportunities remain to explore niche and high-value markets for urban wood. Although most clean wood goes to the hog fuel market, local higher-value options include finger-jointed lumber manufacturing, landscaping wood chips, and erosion-control strands. The County could continue to work with manufacturers and consumers through the LinkUp program to develop these markets.
- **Edible food:** Recover more edible food from the waste stream. King County could explore opportunities to better-connect grocery stores, food distributors, institutions, and even restaurants with donation opportunities for perishable food that would otherwise be disposed or composted. Seattle has recently begun a similar program based on Portland Metro's Fork-it-Over program (Portland, Oregon).
- **Gypsum's paper backing:** Gypsum processors do not currently have reliable markets for gypsum's paper backing, although several possible uses exist, including compost, acoustical ceiling tiles, and poultry bedding. King County's LinkUp program could be a natural fit for this type of effort.

### ***Longer-term Focus***

There are several materials for which need or opportunity is relatively high, but for which there are few tangible options for King County and cities to influence the market in the short term. These are generally materials where recycling programs are well-established but for which either (1) capturing additional material would be difficult given current infrastructure, policies, and markets, or (2) markets are currently strong but may need monitoring to be prepared for possible long-term development needs. As a result, the consultant recommends that King County efforts on the following materials focus on long-term action to educate the public, gradually expand service, and provide incentives: plastic bottles, containers, and film; bio-based plastics; paper; scrap metal; tin and aluminum cans; non-reusable textiles; cathode ray tube glass; glass fines (pieces of broken containers too small to sort); and self-hauled yard waste. For further details, please see the full *Market Assessment* report.

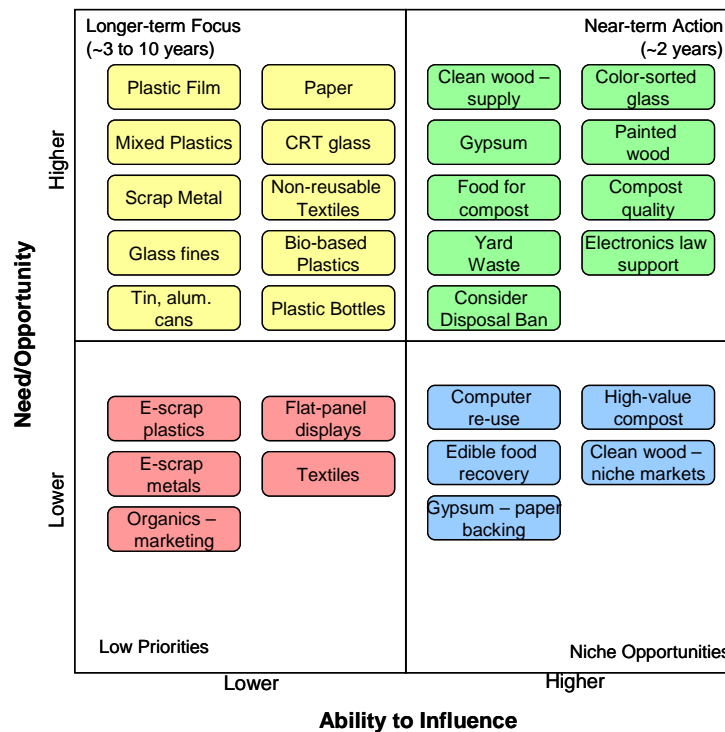
### ***Lower Priorities***

The following materials were classified as lower priority because the existing infrastructure and programs are generally working well (i.e., need is low), markets are

strong, and there are few tangible opportunities to add value or influence the market. As for materials in the “Longer Term Focus” category, materials classified as “lower priorities” would also benefit from education and marketing, expanded service, incentives, or bans, but they need not be the focus of efforts in the short term because the likely benefits are low relative to expected cost and effort. Materials classified as *lower priority* include: textiles, flat-panel monitors; e-scrap plastics (e.g., CRT monitor and television housings); e-scrap metals (such as CPU housings and circuit boards); and organics (general marketing, although specific other strategies are higher priority, as described above).

## Summary

Strong recycling markets for many materials present abundant opportunities to increase recycling and support the health of the local and regional recycling industry. The following chart summarizes this assessment of options and materials.



## Commodity Summaries

The following sections provide brief overviews of key market conditions, current recycling levels, needs, and opportunities for increasing recycling of the nine major commodity categories covered in this Market Assessment study: electronics, glass, gypsum, metals, organics, paper, plastics, textiles, and wood.

### Electronics

Washington’s 2006 Electronic Product Recycling Law (RCW 70.95N) is likely to dramatically increase recycling of used electronic products in King County and throughout Washington State. King County can take an active role to ensure smooth implementation for local recyclers and material generators, and it can work with the State and others to promote reuse and resale and ensure that recycling meets

environmental and health standards. Markets and opportunities vary by electronic product commodity, as summarized below.

- The generation of obsolete or discarded **flat-panel monitors** will increase in the coming years, but local recyclers report that recycling methods and markets are developing in step with growing supply.
- With the continued expansion of markets for plastics, e-scrap **plastics** are being readily marketed both domestically and internationally. Strong markets for these plastics are expected to continue.
- Markets for **metals** recovered from e-scrap are strong, no problems are anticipated, and the need for public sector involvement appears minimal.
- The quantity of cathode ray tube (CRT) **glass** available for recycling in King County is likely to increase in the short term with the transition to flat-panel technology and the upcoming implementation of RCW 70.95N. Since domestic markets have largely evaporated, King County could help ensure that exports of CRT glass do not violate laws elsewhere and are handled in ways that meet environmental and worker safety standards.

## **Glass**

Most glass in King County is handled by two major recyclers: Saint-Gobain uses glass to manufacture new bottles, and Dr. Concrete sells glass fines for construction uses. While manufacturing new bottles is a higher value market, most of King County's glass goes to construction while Saint-Gobain is constrained by the limited supply of recycled cullet meeting its specifications. Factors limiting the recycling of glass into new bottles include the relatively poor quality of glass produced through single-stream collection and processing, the limited and nearly outdated optical sorting equipment at Fibres, and apparent lack of cooperation among local parties. Possible actions for King County include hosting a stakeholder "summit," which may help foster opportunities to increase the value of glass in the local economy. Additionally, King County could help promote the use of glass fines to the construction industry if that market encounters difficulties.

## **Gypsum**

Green building and a strong local construction industry are contributing to a significant supply of scrap gypsum that could be recycled. However, processors and manufacturers report that the local manufacturers will not accept any more recycled gypsum for use in making new gypsum wallboard. New markets for gypsum are needed, particularly ones that will pay to obtain the material. Options include assisting processors with developing the cement market for recycled gypsum and/or the acoustical ceiling tile market for the paper backing.

## **Metals**

Both tin and aluminum cans have high recycling rates and strong markets, yet several thousand tons of these materials are still disposed. Similarly, a sizeable quantity of scrap metal is still disposed in King County, at both public transfer stations and private C&D facilities. Promising opportunities to increase metal recycling include (1) a ban on the disposal of aluminum and tin cans and, for scrap metal, adding recycling capacity to transfer stations as feasible; (2) publicizing existing recycling options (mainly in the private sector); and (3) providing on-call curbside collection for large scrap metal.



## **Organics**

In King County and the region, markets for compost are strong and could absorb more supply. Strategies to increase recovery of food waste and yard waste differ somewhat and are summarized below.

- **Food waste** is still a major component of the waste stream, despite expanded local opportunities for curbside food recycling. King County could launch a regional outreach campaign to increase awareness and encourage residents to participate. King County could also explore opportunities to connect large commercial food waste producers with donation opportunities for perishable food. Most organic material collected for recycling in King County is processed by Cedar Grove into moderate-value compost that is in high demand. Producing higher-value composts may be viable, particularly if the County can help increase the recovery of food waste, a high-nutrient feedstock.
- **Yard waste** remains one of the biggest components of self-hauled waste. King County could consider increasing the number of facilities with green waste drop-off, inform residents and targeted businesses of nearby yard waste drop-off sites, or partner with private compost facilities to provide temporary collection containers at selected transfer stations.

## **Paper**

Markets for paper have been and are expected to continue to be strong. Recycling rates of paper are generally high in King County, yet tens of thousands of tons remain in the waste stream. Most paper recycling programs (including curbside) are mature, so further recycling rate improvements will not come easily. Mixed paper from residents and office paper from businesses present the largest opportunities. Continued education and marketing efforts will help, as would technical assistance and embedded recycling services offered to businesses, but great improvements are unlikely without a significant new driver, such as a disposal ban.

## **Plastics**

With rising oil prices and strong overseas demand, recycling markets for traditional plastics are at an all-time high, although prices vary considerably by type.

- Recycling rates for **plastic bottles** are low in King County (and throughout the country). Markets for both PET and HDPE bottles are strong, yet few promising strategies exist for King County to influence the market dramatically. Options for King County to increase recycling include a disposal ban, increased marketing and education, product stewardship, and expanded recycling in public places.
- Markets for **plastic film** from the commercial sector are strong, and numerous recyclers have capitalized on the high prices and large supply. A significant supply that has not been targeted is plastic film from non-warehouse types of businesses and from residents. Opportunities include educating the public, expanding service, and providing incentives.
- Markets for **non-bottle containers** (i.e., tubs) and **#3-#7 containers** exist, but prices and demand, although at all-time highs, are still far lower than those for PET and HDPE. Despite the low value of the material, King County could boost

its recycling rate by promoting recycling of these materials without adversely impacting the market.

- Recyclers view **bio-based plastics** as a potential problem. Overall, their current market share is tiny, but King County should monitor this issue and consider a product stewardship approach to ensure that bio-based plastics do not hamper local recycling programs.

## ***Textiles***

The existing (largely nonprofit) infrastructure for textile reuse and recycling is well established, appears to be functioning efficiently, and is not currently in need of public sector assistance. Two possible areas for attention are 1) further promotion of these existing opportunities, or 2) addition of collection options at King County transfer stations. To address the several thousand tons of textiles that are still disposed locally, King County could investigate recovering more non-reusable textiles for recycling to other uses, such as rags, insulation fiber, and upholstery fabric.

## ***Wood***

Significant quantities of clean urban wood<sup>4</sup> remain in the waste stream, and markets for the material are strong, particularly for use as hog fuel. Although most clean wood goes to the hog fuel market, King County could continue to work through the LinkUp program to develop local higher-value options, such as finger-jointed lumber, landscaping wood chips, and erosion-control strands. Options include a disposal ban on clean urban wood, financial incentives for wood recycling, expanded space at transfer stations for recycling and reuse, and technology to neutralize treated wood. In contrast, few markets exist for painted and stained wood. King County could explore the environmental implications of using painted wood as hog fuel as well as conduct research into new markets or technologies that could be used to recover this type of wood.

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<sup>4</sup> Urban wood includes dimensional lumber, pallets, crates, manufacturing scrap, engineered wood, roofing and siding, finished and unfinished furnishings, and painted or stained wood.