

**Northwest Carpet Recycling Strategy for
Establishing Carpet Processing Capacity and End Markets for Recovered Material**
prepared by
The Northwest Carpet Recycling Workgroup
March 19, 2010

Introduction

This document presents actions recommended by the Northwest Carpet Recycling Workgroup (Workgroup) for the following objectives:

- Bring carpet processing capacity to the Northwest
- Increase end markets for recovered carpet material

Since convening in August 2009, the Workgroup has reviewed research and solicited business input on actions needed to achieve the objectives stated above. Organized by Seattle Public Utilities (SPU) and King County Solid Waste Division's LinkUp Program (King County LinkUp), the Workgroup members include state and local governments and research university representatives in Washington, Oregon, California, and British Columbia.

Background

Carpet can be recycled. The Pacific Northwest enjoys a convergence of opportunity right now to stop landfilling of this valuable resource:

- There is a large amount of carpet in the waste stream
- Processing technology exists and has proven successful elsewhere in the country
- National end markets exist for recovered nylon, the most common fiber type
- The environmental benefits are well-documented

The Waste Stream: According to the Carpet America Recovery Effort (CARE) 2008 Annual Report, of the 2,821,000 tons (5,642 million pounds) of post-consumer carpet discarded in 2008 in the U.S., 122,000 tons (243.4 million pounds) or 4.3 percent was recycled. A slightly higher percentage (5.2 percent) of post-consumer carpet was diverted from landfills. Currently, most of the 50,000 tons of used and scrap carpet generated in Seattle and King County is being landfilled with area solid waste agencies estimating that only a very small percentage is recycled.

Processing Technology: Currently, the small amount of carpet that is collected for recycling, is sorted, consolidated and shipped primarily to the southeastern U.S. where it is processed to separate the constituent materials. While the Pacific Northwest does not currently have carpet processing capacity, there is a growing network for collection of used carpet for recycling, and several local recycling companies are consolidating carpet and shipping it for recycling out of state. Available processing technologies are promising for establishing local facilities to complement current eastern U.S. infrastructure.

End-Markets: Recycling end-markets for carpet-derived materials in other parts of the country include new fiber for carpet, carpet backing, carpet pads/cushions, textiles, auto parts, wood-plastic composites and flooring. Other end-markets include use as a fuel substitute for coal in industrial boilers.

Environmental Benefits: A 2008 report prepared by Sound Resource Management for SPU found that recycling was by far the preferred end-of-life choice for carpet in terms of greenhouse gas emissions. Specifically, recycling one ton of used carpet into new products reduces greenhouse gas emissions between 8,300-8,600 pounds of carbon dioxide equivalents (the range relates to the distance which used carpet needs to be hauled to be recycled and manufactured into new products). Used carpet disposed in a waste-to-energy incinerator increases climate changing emissions by 2,200 pounds CO₂.¹

Laying the Groundwork

In March of 2008, SPU, with support from the King County LinkUp program, convened a Forum of national carpet manufacturers and recyclers, local flooring sellers, local recyclers and processors, and local solid waste and economic development agencies to explore carpet recycling in the Northwest. The Forum was the culmination of some months of building relationships in the carpet industry locally and nationally, and researching collection, processing, and end-market considerations.

From this Forum, it was determined that a strategy was needed to encourage carpet processing and end market development for carpet-derived materials. A Carpet Recycling Workgroup was formed by SPU and King County LinkUp to create this strategy. A list of Workgroup members who contributed to the Strategy document development is below:

Workgroup Sponsors	Affiliation
Shirli Axelrod	Seattle Public Utilities, WA
Beth Humphreys	King County Solid Waste Division, LinkUp program
Kris Beatty	King County Solid Waste Division, LinkUp program
Workgroup Team Members	Affiliation
Mary Bell Austin	San Mateo County, CA
Joyce Cooper	University of Washington
Karl Englund	Washington State University
Lynn France	City of Chula Vista, CA
Glen Geoff	City of Spokane, WA
Nicole Hoekstra	Western Washington University
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Leslie Kochan	Oregon Department of Environmental Quality
Nancy Leigh	Georgia Tech, GA
Karen Leonas	Washington State University
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Shannon McClelland	Washington Department of Ecology
James Palmer	Washington Department of Commerce
Lisa Sepanski	King County Solid Waste Division, WA
Jay Shepard	Washington Department of Ecology
Lyn Smirl	British Columbia Ministry of Environment
Bill Smith	City of Tacoma Solid Waste Management, WA
Tim Stearns	Washington Department of Commerce
Jan Whitworth	Oregon Department of Environmental Quality

¹ *Environmental Impacts from Carpet Discards Management Methods*; Dr. Jeffrey Morris, 2008.
<http://your.kingcounty.gov/solidwaste/linkup/carpet/project.asp>

At the first Carpet Recycling Workgroup meeting, it was determined that it was crucial to get business and industry input early in the strategy development process. To do this, the Workgroup hosted two business roundtable meetings, in September and October, 2009. The first meeting concentrated on carpet removal, collection, and sorting and the second on end markets and demand-side processing.

The meetings were very well attended with 79 carpet-related and recycling industry representatives and Workgroup members attending the first meeting and 47 attending the second. At these meetings, all parties were asked to respond to key questions about what they thought were the most important activities needed to get carpet recycling established in the region.

The findings from these meetings were then combined with input from the Workgroup members and a list of possible strategies and tactics emerged. The Workgroup has since prioritized and combined tactics into the recommended actions included in this document.

Strategy Document and Action Plan

The Strategy document and action plan below are the culmination of Workgroup considerations, identifying actions and parties to involve, to the best of our current knowledge. In this document, the Workgroup has stated priority strategies, identified needed actions, and considered how to divide up the effort.

It is expected that further details and changes as appropriate will be made during implementation; additional information is always welcome. A number of items in the action plan are already underway, and/or co-exist with other programs in both the public and private sectors; this compilation takes advantage of existing efforts as well as putting forward new measures the Workgroup endorses.

The table below is organized for convenience into work area categories, numbered one through seven, along with a “point person” (or persons) and appropriate parties already involved or expected to be contacted.

Interested parties can track the development of this project and activities by visiting the “Carpet” pages of the King County LinkUp Web site at www.kingcounty.gov/linkup, or by contacting either of the Workgroup sponsors:

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Action	Lead(s) and Others Involved	Timing and Status
<p>1. Product Stewardship: Pursue product stewardship measures, such as legislation, MOUs, product redesign, closed-loop recycling, take-back programs, etc., including:</p> <ol style="list-style-type: none"> a. Participate actively in Carpet America Recovery Effort (CARE) 2012 negotiations, and follow up on the possibility of state-specific MOUs. b. Support CARE efforts to fund end-market development. c. Research, analysis, planning and implementation through the Northwest Product Stewardship Council (NWPSC). 	<p>Lead: Sego Jackson</p> <p>1a and 1b:</p> <ul style="list-style-type: none"> • Jay Shepard, Shirli Axelrod, WA • Jan Whitworth, Scott Klagg, OR • Mary Bell Austin, CA <p>Others involved:</p> <ul style="list-style-type: none"> • CARE • Recyclers • Product Stewardship groups, incl. NWPSC, CalPSC • Cal Recycle • West Coast Climate Forum 	<p>Start: 2010 Duration: 2-5 years</p>
<p>2. Carpet Recycling: Increase demand for carpet recycling, from public and private property owners, architects, designers, and project managers.</p> <ol style="list-style-type: none"> a. Incorporate carpet recycling mandates into public agency/public housing projects and contracts. Specify mandatory recycling of carpet removed in more public agency jobs. b. Engage architects & designers, general contractors to learn how to make recycling more attractive to them and to increase their specifying of carpet recycling. Provide a model carpet recycling specification and lists of approved haulers and recyclers. Work with flooring sellers to educate other businesses. Get more west coast customers to specify carpet recycling. c. Engage general contractors to understand how to make recycling more attractive to them; work with WA State Flooring Association to educate flooring contractors. 	<p>Co-leads: Shirli Axelrod and Beth Humphreys</p> <p>2a: Beth Humphreys 2b: James Palmer</p> <p>Others involved:</p> <ul style="list-style-type: none"> • Public housing authorities • Public agency purchasing managers (including port and transit agencies) • Architect & design firms • Green building organizations (e.g., Ecobuilding Guild, Cascadia Green Building Council) • Flooring sellers, manufacturers' account reps 	<p>Start: 2010 Duration: ongoing</p>

Action	Lead(s) and Others Involved	Timing and Status
<p>3. <i>Demand for Recycled Content Products and Carpet-Derived Commodities:</i> Increase demand for commodities derived from and products made with recovered carpet fiber.</p> <ol style="list-style-type: none"> a. Work with public sector to specify the purchase of carpet and other products made with recycled fiber. b. Work with the private sector (architects, designers, multi-family housing owners, etc.) to specify the purchase of carpet and other products made with recycled fiber. c. Work with local manufacturers to use carpet-derived materials as feedstock. (Consider all fiber types and by-products.) <ol style="list-style-type: none"> i. Consider and research innovative uses in line with regional industry. ii. Research insulation as a potential end-use to tie-in with energy efficiency projects and grants. iii. Look outside traditional uses for plastic products. Look at Northwest manufacturing profile and inventories. iv. Research on green products and life cycle impacts. Lifecycle analysis to be factored into decision making. Use lifecycle assessment databases as a tool for identifying which manufacturers can use the recovered materials. d. Collaborate with the plastics industry, plastics recycling industry (compounders, equipment dealers, market analysts, professional organizations, CARE, Polymers Centers, etc.) to develop end-markets. Research how to break carpet down into constituent materials. Provide a resource to match specification of feedstock to supply chain of local manufacturers. Provide recovered material specs for local manufacturers working with WA Department of Commerce. Current WWU intern working with SPU might present to manufacturers' association to get businesses thinking about working with researchers to come up with solutions. Offer incentives for use of recycled inputs. e. Collaborate with regional universities for product testing, design, engineering, etc. (WSU, WWU, UW). Provide student study projects. 	<p>Co-leads: Shirli Axelrod and Beth Humphreys</p> <p>3a: Shirli Axelrod 3c, 3d and 3e: Karl Englund and Nicole Hoekstra.</p> <p>Others involved:</p> <ul style="list-style-type: none"> ● Public housing authorities ● Public agency purchasing managers (including port and transit agencies) ● Architect and design firms ● University of Washington (UW) ● Western Washington University (WWU) ● Washington State University (WSU) ● WA Manufacturing Services ● WA Technology Center ● Property owners and management firms/organizations such as Rental Housing Association, Building Owners and managers Association (BOMA), WA Apartment Association ● Plastics experts ● Business technology assistance staff 	<p>Start: 2010 Duration: 1-5 years</p>

Action	Lead(s) and Others Involved	Timing and Status
<p>4. Public Policy: Use solid waste or other public policies to influence costs and motivate flow of quality material to recycling.</p> <ol style="list-style-type: none"> a. Consider tip fees and disposal restrictions. b. Consider measures to be part of contractor licensing and/or bonding. c. Certify C&D haulers and C&D receiving facilities to level the playing field and increase transparency and quality. 	<p>Lead: Shirli Axelrod</p> <p>4a: Bill Smith</p> <p>Others involved:</p> <ul style="list-style-type: none"> ● Seattle Public Utilities C&D staff ● Tacoma Public Utilities ● Other Solid Waste Agencies ● Contractor licensing agencies ● Building permitting depts. 	<p>Start: 2010 Duration 2-5 years</p>
<p>5. Asbestos: Reduce asbestos contamination of used carpet.</p> <ol style="list-style-type: none"> a. Establish procedures with local building permit agencies and air agencies requiring and documenting asbestos surveys and abatement before permit work proceeds. Develop increased enforcement measures and joint inspection authority (building inspectors, air, labor and industries, etc.). b. Institute measures applicable to haulers and receiving facilities to motivate a “level playing field” for compliance with asbestos laws. c. Engage asbestos survey and abatement firms in publicizing asbestos laws and liability to property owners/managers and project managers. d. Consider measures that can be part of contractor licensing and/or bonding. 	<p>Lead: Kinley Deller</p> <p>Others involved:</p> <ul style="list-style-type: none"> ● Seattle and King County with Building Departments in their jurisdictions ● Clean Air Agencies ● WA Labor and Industries (L&I in other states) ● Building permitting departments ● Property owners, management firms and organizations (e.g. Rental Housing Association, BOMA, WA Apartment Association) ● C&D and MSW receiving facilities ● Contractor licensing agencies ● Asbestos abatement firms ● Salvage and deconstruction firms 	<p>Start: 2010 Duration: 1-3 years</p>

Action	Lead(s) and Others Involved	Timing and Status
<p>6. Economic Development: Form a consortium to bring a carpet processing facility to the Northwest (multidisciplinary team with manufacturing technical assistance, financials, permit ombudsman, etc.).</p> <ol style="list-style-type: none"> a. Actively reach out to carpet recycling companies and pitch them a package that would motivate them to move to the Northwest. Build legislative support for this recruitment with one or more state legislators. Develop defined list of carpet processing facility parameters. b. Integrate carpet recycling economic development into a larger effort to increase economic development of recycling industries. Facilitate high-level talks between Economic Development and Recycling leaders. c. Create financial incentives for recycling (e.g., tax breaks/credits, permit advantages). Address permits as part of the economic development strategy. d. Create financial incentives, and funding mechanisms and sources, for businesses that use recovered carpet fiber in manufacturing in the region. e. Create financial incentives that help fund local business expansion and/or prototyping of promising new processes or end-products. f. Introduce and support legislation changing state taxes affecting recycling industries, and equipment for recycling industries. g. Work with counties and cities to identify zones, funds/tools that could be offered to help development. Need to create toolkit that make this appealing to companies. h. Show how these are “green jobs.” 	<p>Lead: James Palmer</p> <p>6a-6h: Beth Humphreys and Shirli Axelrod 6b: James Palmer</p> <p>Others involved:</p> <ul style="list-style-type: none"> • Economic Development organizations • WA Manufacturing Services • WA Technology Center • Governor’s office • Shorebank Pacific • Cascadia Revolving Fund • Washington Economic Development Finance Authority • WA Department of Ecology Coordinated Prevention Grants • Stimulus disbursement programs 	<p>Start: 2010 Duration: 1-3 years</p>

Action	Lead(s) and Others Involved	Timing and Status
<p>7. Collaboration: Network and collaborate with interested parties and potential participants.</p> <p>a. Network with carpet recyclers around the country, with carpet fiber and carpet manufacturers and national processing facilities, to share lessons learned and information on new developments.</p> <p>b. Facilitate connections among businesses along the infrastructure chain, convene strategic forums, share contact information, leverage with work in other jurisdictions (like Canada).</p> <p>c. Participate in and plan events (e.g., CARE and others)</p>	<p>Lead: Shirli Axelrod</p> <p>Others involved:</p> <ul style="list-style-type: none"> ● WA State Recycling Association (WSRA) and Association of OR Recyclers (AOR) (and their conferences) ● Construction Materials Recycling Association (NW chapter) ● Carpet recycling companies ● Carpet manufacturers ● Polymers Center ● CARE ● NWPSC ● CalPSC ● CA Resource Recovery Association (and their conference) ● Cascadia Green Building Council conference ● Built Green conference (March) 	<p>Start: 2010 Duration: ongoing</p>

In addition to the activities in the Action Plan above, the following actions were not included as priorities in this Strategy document. However, the Workgroup chose to keep them in the Strategy document so they are captured for potential implementation at a later date.

- Incorporating carpet recycling mandates into stimulus funds and carbon reduction/energy efficiency projects.
- Prepare carpet processing RFP (e.g.: similar to yard waste - direct where to put material, provide containers, and contract for processing).
- Issue RFP and select partners to receive technical and/or marketing assistance.
- Consider marketing through home improvement retailers who claim a green image.
- Address export potential from West coast as attraction for processors/sellers of used carpet fiber.
- Organize a symposium and/or trade show of recycling industries, recycled products manufacturers.
- Launch or join a design “challenge” or competition for processing and products using local recovered materials.
- Establish a “Clean WA Center” type of enterprise, a business development center or agency similar to those in other regions (Mid Atlantic Consortium of Recycling & Economic Development Officials, Southeast Recycling Development Council, New York State, Lowell Center in MA, etc.).
- Consider more collection sites with quality controls in order to support flooring sellers taking back used carpet to recycle; enlist additional flooring sellers to take carpet for recycling; enlist Goodwill, Salvation Army, and/or Savers to be collection sites.
- Tap related industries that recycle other materials to take carpet (e.g. cluster of textile recycling, Buffalo Industries, Goodwill, SOEX) for joint efforts and examples of successful recycling infrastructure/market development.
- Undertake efforts to facilitate reuse of carpet that is still in good condition.
- Learn how asbestos regulations and enforcement work in other states, since Washington’s system of enforcing through building permits doesn’t appear to work well. Potential to add later depending on how the current effort between Puget Sound Clean Air Agency and local building departments works.

Action Plan Implementation

Many of the actions in this Strategy are underway by government agencies and/or businesses, and those efforts have good momentum in the Northwest region. Some Workgroup members may also initiate similar actions in additional jurisdictions or regions. Much of the implementation entails public-private partnerships, with government working cooperatively within and across government agencies and hand-in-hand with private industry. More detailed workplans will be prepared as appropriate, laying out the work to be completed, available resources and the timeline for implementation. The assigned lead for each action will work with interested parties to create the workplan and to guide its implementation.

The Workgroup sponsors (King County LinkUp and SPU) will use e-mail, the website, and meetings as appropriate to keep the Workgroup members and larger interested community up-to-date. The King County LinkUp website will be kept up-to-date with information about this project: www.kingcounty.gov/linkup.

The Workgroup sponsors will review the Strategy periodically and determine when and if updates are necessary. Any updates will be made with participation from the Carpet Recycling Workgroup.