WASHINGTON DEQ RFI RESPONSE: PAPER CUPS

Washington Statewide Recycling List and Needs Assessments

This information is submitted by the Foodservice Packaging Institute in response to the April 1, 2026, Request for Information.

We welcome questions and can provide additional details upon request. Please contact:
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This submission provides technical information and supporting data regarding the recyclability of paper cups, including compatibility with existing recycling infrastructure, material flow behavior, contamination considerations, and end-market viability. Data sources include FPI research, industry studies, and published analyses of paper cup recycling systems.

Background

The Washington Department of Ecology (Ecology) has requested technical information to support development of statewide collection lists and needs assessments required under the Recycling Reform Act passed by the legislature in 2025. The law establishes an extended producer responsibility (EPR) program for consumer packaging and paper products and directs Ecology to evaluate covered materials against specific criteria to determine their suitability for collection across recycling, composting, and other systems.

The Foodservice Packaging Institute (FPI) was founded in 1933 and is the leading authority for the North American foodservice packaging industry. FPI encourages the responsible use of all foodservice packaging (FSP) through promotion of its benefits and members' products. FPI's core members are foodservice packaging manufacturers and their raw material and machinery suppliers. With over 75 members, FPI includes approximately 90% of converters and suppliers in the foodservice packaging industry in North America, and over 200 foodservice operators, distributors, and educational institutions.

FPI is committed to reducing the impact of its products on the environment and is dedicated to making sure these items are recovered and diverted from the landfill. FPI has several ongoing member groups working to increase the recovery of packaging through recycling or composting. These recovery groups focus their efforts on getting more paper and plastic foodservice packaging recycled or composted. Since their inception, these groups have been working with communities, recycling facilities, composters, and end markets to expand and

find stable and sustainable recovery solutions for these valuable materials. This group receives technical support from RRS.

Through its Community Partnership program, FPI has partnered with 30 residential programs to add foodservice items to their accepted material lists. The specific items are determined through consultation with the individual program and the material recovery facilities (MRFs) and end markets that process its materials. Because these efforts are market-based, they have proven stable and sustainable without further assistance from FPI, and the partners report numerous benefits to their programs.

The Paper Cup Alliance (PCA) was founded in 2018 to accelerate the adoption of paper cup recycling in the U.S. This group includes manufacturers, users, and recyclers of paper cups. PCA's efforts complement the Community Partnership program and include market development work and equipment grants for MRFs who require additional sorting to process paper cups.

This Request for Information (RFI) submission provides information regarding recyclability factors related to paper cups to support decisions regarding their inclusion on Washington's statewide collection lists. The data has been compiled with the assistance of technical consultant RRS, who has conducted ongoing research on recycling and recyclability of these materials for FPI and other clients.

FPI Research

Since the inception of its recovery efforts over 15 years ago, FPI has been conducting research on recyclability of foodservice packaging to understand and overcome potential barriers to its recovery. This research has provided the foundation for FPI's successful Community Partnership program. Many of these studies have been collaborations with other industry stakeholders including the Association of Plastic Recyclers (APR) and the Sustainable Packaging Coalition (SPC), and since 2012, much of this research has been conducted with technical support from RRS and other technical experts including Cascadia Consulting, DSM, Stina (formerly More Recycling), and Moore and Associates. Below is an overview of these research efforts and the questions they were designed to address:

Overview of FPI's Foundational Research & Milestones

End Markets

- 2012: Estimated baseline foodservice packaging material generation
- 2013: Estimated impact of FSP on bales
- 2014: Collected and published end markets map for foodservice packaging
- 2015: Analyzed mixed paper bales in Seattle & New York City
- 2021: Joint Declaration by 8 mill groups representing over 35 mills in the U.S. and Canada
- 2021: Mixed paper bale audits and plastic bale audits corroborated 2015 findings
- 2022**:** Released "The State of Paper Cup Recycling" white paper
- 2022: Mixed paper bale audits from three partner MRFs

- 2022: Co-sponsored full access study on selected FSP items
- 2024: Resurveyed and reconfirmed mills for market cup acceptance

Resident Messaging & Collection

- 2012: Learned curbside had greatest volume for collection
- 2013: MRF Benchmarking Study identifying fiber recovery opportunities
- 2014: Food Residue Studies (Boston and Delaware)
- 2016: Co-sponsored SPC Centralized Study of the Availability of Recycling
- 2016: National Resident Messaging Survey
- 2017: Developed graphics & resident education materials for communities
- 2023: Updated 2016 Resident Messaging survey
- 2022: Updated 2013-2014 Food Residue Study
- 2025: WM national portfolio acceptance of paper and PP cups

MRFs/Sortation

- 2014: MRF Material Flow Study
- 2021: Studied paper cup flow (four MRFs)
- 2025: ReMA ISRI's inbound specs adds paper cups

Overviews of studies are available at www.recycleFSP.org

Studies of particular relevance for paper cups are:

- 2022 Food Residue Study
- MRF Flow Studies
- Mixed Paper Bale Audits (included in Appendix)
- 2022 Resident Messaging Survey

In addition, a 2022 white paper by Moore & Associates summarizes the landscape and developments related to recycling paper cups.

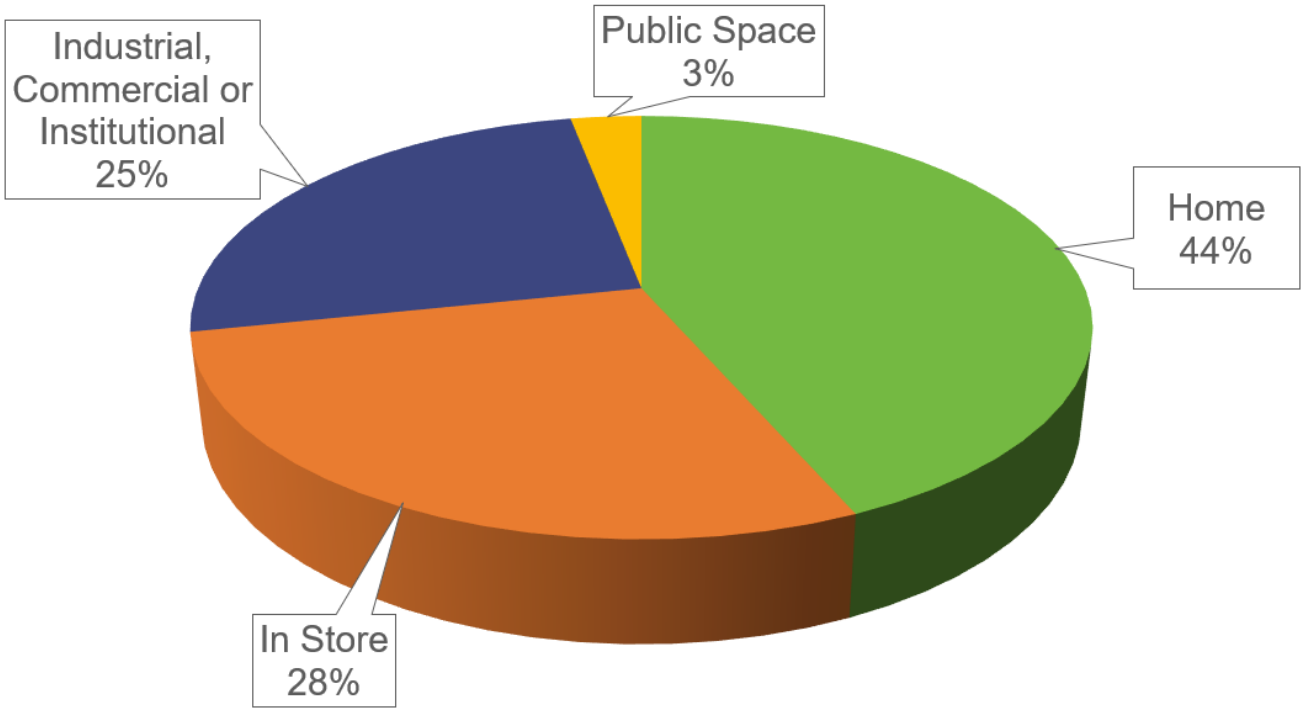
Fiber: Paper Cups

This submission focuses on polycoated paper beverage cups. Most paper cups used in the U.S. are made from solid bleached sulfate (SBS) white paperboard and are lined with polyethylene (PE). A very small percentage are lined with polylactic acid (PLA). Unless otherwise specified, the term "polycoat" cups refers to both PE and PLA-lined cups. Cups used for hot beverages have the polycoat layer only on the inside, whereas cups used for cold beverages have a second layer of coating on the outside to protect the integrity of the cup from condensation. Wax-coated cups no longer play a significant role in the paper cup market.

A1 – Compatibility with Collection, Sorting, and Processing Infrastructure

The Material's Compatibility with Existing (Washington) Recycling Infrastructure

According to FPI research most foodservice packaging is discarded at home or in the workplace. This means that residential curbside collection offers significant potential for capturing this material to achieve optimal diversion. The trend toward takeout accelerated during the pandemic.



FPI research (2012) showing the breakdown of foodservice packaging by point of disposal.

Recycling acceptance for paper cups in Washington varies by jurisdiction, with no consistent statewide policy. Based on FPI access verification, which counts only communities that explicitly list paper cups as accepted on

their official websites, statewide access is estimated at 25%, with the City of Seattle among the early adopters. Additional jurisdiction-specific acceptance information can be provided upon request.

Despite this uneven access at the community level, there is growing evidence that paper cups can be processed at scale within modern recycling systems. WM, the largest recycler and hauler in North America, has recently added paper and cups to its list of accepted materials and committed to ensuring its single-stream facilities can accept, sort, and market them. In Washington, WM operates four regional MRFs including Cascade Recycling Center (Woodinville/Seattle), JMK Fibers (Tacoma), WM Peninsula Recycling (Gig Harbor), and the SMaRT Center (Spokane) that process recyclables from across the state. Additional facilities, including Recology and Republic Services in Seattle, also accept paper cups. The known service areas for four of the six MRFs represent more than 7.7 million households (about 40% of Washington's population). Because service area data for the remaining two MRFs is unavailable, the actual share is higher. Acceptance at these MRFs is particularly notable, as it demonstrates that paper cups can be handled at high volumes within modern, single-stream recycling systems.

FPI is also working with Waste Connections to update outreach materials in Washington to include paper cups and cartons, alongside resident education efforts. While other MRFs in the state may also be sorting paper cups, there remains a gap between processing capability and community-level acceptance and messaging.

Given this variability, FPI does not have detailed insight into how individual Washington MRFs manage the cups they receive, but expects they are directed either to mixed paper or residue streams.

The Practicalities of Sorting and Storing the Material

Recovering paper cups does not require sorting them into a new bale; they can be recovered through existing commodities such as mixed paper or a polycoat bale consisting of cartons and cups.

MRFs who choose to include cups in mixed paper can allow the cups on the fiber line to flow to that bale and can redirect cups from the container line to the fiber line or to mixed paper. Based on bale audits conducted by FPI (see appendix), recovered paper cups make up a very small percentage of the bale (less than 0.5% by weight, often less than 0.25%). Overall cup recovery rates are estimated at approximately 10%. However, MRFs handle large volumes of mixed paper, so storage (and storage time) would not be a concern.

Similarly, MRFs who choose to sort cups into a polycoat bale can pick the cups from the container line and direct them to that bale. This positive sort can be a manual sort, although some MRFs are investing in automated solutions (i.e., optical or robotic sorters) that can recover cups along with cartons and other polycoated fiber. Cups can contribute a significant quantity of material to a carton/polycoat bale, making up around 10-25% of that bale by weight. This additional volume can be welcome as it allows the MRF to reach truckload quantities sooner.

FPI's Paper Cup Alliance has an equipment grant and technical assistance program for MRFs who require additional equipment to process paper cups.

A2 – Ease of Material Identification and Preparation for Recycling

The Ability for Waste Generators to Easily Identify and Properly Prepare the Material

Paper cups are easily identifiable by residents and easy to describe and depict in program guidance due to their distinct shape and the consistent use of the term "paper cup" to refer to them, both in the recycling industry and among the lay public.

The only preparation needed is to empty the cup and remove the lid or any other ancillary items.

FPI inventoried the messaging used in leading recycling programs and reviewed terminology recommended by several industry groups. It also conducted resident messaging surveys in 2016 and again in 2022 to inform its approach. These insights are reflected in its best messaging practices, which are applied through the Community Partnership program in resident communications for each program addition. These best practices include recommended terminology, effective graphics, and simple preparation instructions aimed at promoting recycling clean and empty items and minimizing contamination (the resident education kit, including the study results, is available for download). The recommended graphics feature clean, empty cups, with no lids or straws attached. This messaging strategy has proven effective and, using it in our 30 partner communities has resulted in reduced residue following the communications campaign.

Food Residue & Reduced Contamination

FPI commissioned studies of food residue on foodservice and food-contact packaging in the residential recycling stream in 2013, 2014, and 2022. These studies found that the amount of residue in foodservice packaging was similar to any other type of food contact packaging and determined to be consistent with what markets are accepting. Cups are used to contain liquids, which generally leave minimal residue on cups due to their low viscosity.

The real-world experiences of communities and MRF accepting cups indicate that with good resident education, paper cups and other foodservice packaging can be added successfully while reducing overall contamination. The communities and MRFs that have participated in FPI's Community Partnership program have not reported any problems with quality or marketability of bales as a result of adding paper cups, and the inclusion of foodservice items to residential programs via the partnerships has proven durable. For example, FPI's partnership with Washington, D.C., in 2017 saw contamination rates of nearly 27% before the campaign. After paper cups were added and the "Recycle Right" campaign was launched, contamination dropped to 20%. Importantly, contamination continued to decline in subsequent years as the district maintained regular outreach, reaching 9.6% in 2021, the most recent data available to FPI.

A3 – Environmental and Health Considerations

High-Value Fiber Recovery

Paper cups are composed of high-quality solid bleached sulfate (SBS) fiber, which represents a valuable resource when recovered through recycling. Recycling paper cups allows this fiber to be retained and reused in new products such as tissue, paperboard, and containerboard, whereas disposal pathways such as landfilling or incineration result in the permanent loss of this material. From an environmental perspective, recycling paper cups represents a higher-value outcome compared to composting or disposal, as it preserves fiber for continued use within the paper system.

With respect to health and safety, paper cups are managed within existing recycling systems alongside other polycoated paper packaging and do not introduce unique hazards beyond those already present in the recycling stream.

A4 – Packaging Design Characteristics and Material Flow Information

The Amount of the Material Available

According to industry research, there are roughly 660,000 tons of paper cups produced annually in the U.S.

The U.S. EPA does not track paper cups specifically but estimates that in 2018, 67.4 million tons (134.8 billion pounds) of paper and paperboard were generated in the U.S. municipal solid waste stream (2018 EPA SMM Facts and Figures).

In the case of paper cups, sources suggest that as many as 70% leave the store/restaurant and at least half end up in the home, where they are available to be recycled in the residential stream.

The Anticipated MRF Capture & Yield Loss During the Recycling Process

In a 2015 MRF flow study co-sponsored by FPI (see appendix), approximately one-quarter of the paper cups flowed to the fiber line, and approximately three-quarters flowed to the container line. These numbers represent the average of results from five MRFs with very different configurations and represent a baseline (i.e., MRFs that were not optimized to capture paper cups).

Based on our work with MRFs, a common assumption is that paper cups that are flattened during collection will flow with fiber, while only round cups will flow to the container line.

FPI has conducted several more recent RFID tests (2020 – 2026), using both flattened and intact cups. These studies represent a baseline in MRFs that were not optimized to capture paper cups and were conducted to help those MRFs understand where and how to best capture cups. These studies have shown that approximately 70%-90% of three-dimensional cups flow to the container line, and approximately 60%-80% of flattened cups flow to the container line. It is important to note that these statistics do not represent capture rates, but rather how the cups flow at the 2D/3D sort.

If the targeted bale is mixed paper, cups that enter the container line do not necessarily represent yield losses, as MRFs that accept paper cups will generally capture them from the container line using manual sortation or automated technology. If the targeted bale is a polycoat bale, the percentage of cups that flow to mixed paper does not necessarily represent yield losses, because they also can be recovered through that bale. The rate of successful capture to the target bale depends on a variety of factors including which bale is targeted, the MRF's 2D/3D screening system, the size and weight of the cup, and the use of manual or automated cup sortation. FPI does not yet have data on MRF capture/yield loss from MRFs that are actively targeting cups.

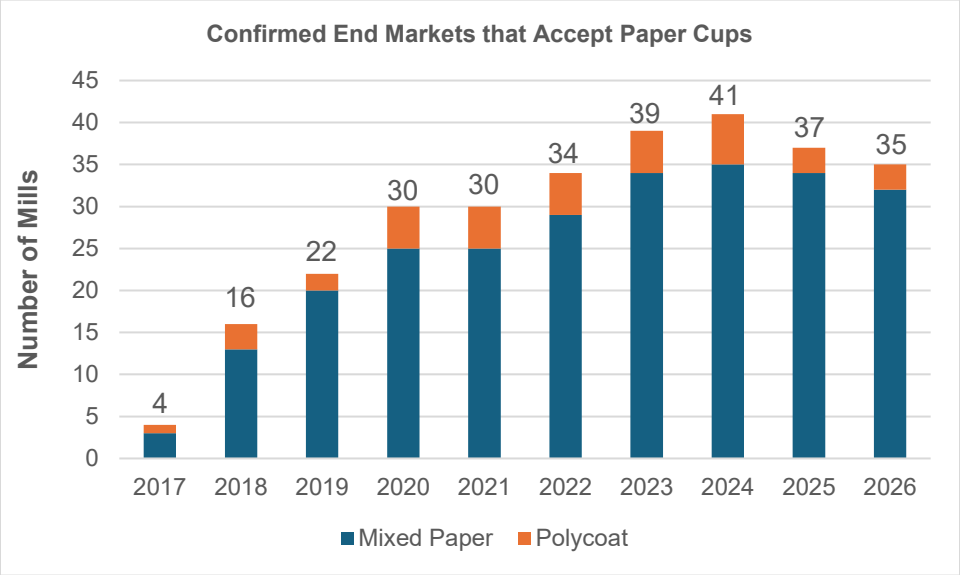
The Anticipated Mill Recovery & Yield Loss During the Recycling Process

Yield varies significantly according to a mill's technology and furnish. Because this is proprietary information, FPI does not have comprehensive data on cup yield. Based on information reported by several members of FPI's mill task force, yield from the cup is in the 70 to 90% range, depending on whether the cup has single- or double-sided coating and the pulping system in use.

A5 – End-Market Viability and Responsible Market Conditions

The Stability, Maturity, Accessibility, and Viability of Responsible End Markets

The paperboard in paper cups contains long, strong fibers that are desired by mills. Traditionally, paper cups and other polycoated items have not been sought by recycled paper mills due to their coatings. However, fiber market trends such as the declining supply of recovered printing grades (e.g., sorted office paper) and the overall desire of the fiber industry to recover more fiber are driving growing interest in this material. Numerous companies have conducted trials of paper cups in their mills and now accept post-consumer paper cups as part of their furnish. The following chart illustrates the change in end market acceptance over the last several years.



As of April 2026, there are 35 confirmed end markets in the U.S. and Canada that formally accept post-consumer paper cups (both single- and double-sided coated cups). Of these, 32 accept cups in residential mixed paper. Another three end markets purchase polycoat bales consisting of cartons and cups. FPI maintains a list of end markets for cups (included as an appendix) and an interactive end markets map that are updated regularly to reflect any changes.

End markets that accept paper cups. Source: https://www.recyclefsp.org/s/End-Markets-for-Paper-Cups.pdf

Notably, the 32 mixed paper mills that have formally confirmed their acceptance of paper cups represent over 75% of the U.S./Canadian mixed paper market by tonnage consumed. FPI facilitates a mill task force that is working to increase recovery of paper cups and paper foodservice packaging. The companies in that task force were joined by several other mill companies to release a joint mill statement of their cup acceptance and commitment to paper cup recycling. The mills that have confirmed acceptance include major North American paper companies such as Georgia-Pacific, WestRock, Essity, Pratt Industries, and Graphic Packaging International, underscoring the credibility and scale of end-market support. This statement is linked here and included as an appendix.

This alignment is further reinforced by recent updates to the Recycled Materials Association (ReMA) ISRI Specifications, the primary standard governing the trade of recycled paper commodities, which now explicitly include paper cups in inbound residential single-stream and dual-stream MRF specifications. Because these specifications are widely referenced in recycling contracts and guide material acceptance across MRFs, mills, and municipal programs, their inclusion of paper cups represents a significant milestone. It signals that the recycling industry has reached alignment on the acceptability of paper cups within established systems and provides a high level of confidence and credibility for their inclusion in community recycling programs. Additionally, the structure of the inbound MRF specification closely mirrors how community recycling lists are written, making it more readily translatable into program guidance and implementation.

At this time, the landscape of mills that explicitly accept cups is concentrated on the eastern half of the U.S. This is in part a function of the overall distribution of paper mills in the U.S., which skews toward the east, and a reflection of the global market dynamics which have long resulted in recovered materials from the western U.S. flowing to overseas markets. While FPI's focus and priority has always been on strengthening North American end markets, some MRFs and brokers do send fiber bales with cups from the western states to Asian markets. Considerably less mixed paper is flowing offshore than it did a few years ago due to changes in China's policy. However, international markets continue to play a role with exports increasingly directed to Southeast Asia and India, and in some cases processed into recycled pulp for use in global paper production.

FPI is particularly focused on expanding end markets in the western United States, including within Washington. Notably, NORPAC (Longview, WA) represents an existing in-state end market that accepts mixed paper, into which paper cups can be sorted and marketed. The presence of a domestic Washington-based mill provides a viable and proximate outlet for fiber recovery, helping to address regional market gaps and strengthen end-market accessibility in the Pacific Northwest.

Because there are still many mills that do not welcome paper cups in their furnish, and because there is still a need for more domestic/North American outlets for materials arising on the west coast, FPI continues to work on end market development. Its mill task force has collaborated with AF&PA to develop information for mills and is engaging directly with mills to offer technical assistance and to facilitate mill trials.

Economic Factors

Recent years have seen dramatic changes in market pricing for mixed paper, as well as fundamental changes in the supply of SOP and other grades. As with any material, strong pricing helps to drive MRF investments in sortation. Currently, mixed paper is trading at around $32/ton in the Northwest (based on data from Fastmarkets RISI). Due to different pricing dynamics for mixed paper vs. polycoat bales, the fact that cups may be marketed in more than one grade can be an advantage; FPI has observed that some MRFs seek to maintain operational flexibility to direct cups to the most economically advantageous bale.

Appendices

- Moore & Associates: White paper
- Multiple companies: Joint mill statement
- FPI and AF&PA: FAQ for Mills
- FPI: Mixed Paper Bales: Audit Results
- FPI: End market list
- RRS, Reclay StewardEdge, and Moore Recycling: MRF Flow Study
- FPI: Food Residue Study Overview