



The Runway to Circularity

Oakland International Airport Terminal 1 Carpet Installation

More than 853 million passengers traveled on U.S. airlines in 2022—just 8% shy of the all-time annual high of 928 million passengers in 2019 and up 30% over 2021 passenger loads. ^[1] Airline travel is steadily returning to its pre-pandemic numbers, and airports are adjusting to the influx.

The **Oakland International Airport** (OAK), which serves the San Francisco Bay area, saw more than 11 million passengers last year. ^[2] The gate-hold rooms in terminals serve as the area where passengers wait to board, board, and deplane aircrafts—meaning they see near constant use. The Port of Oakland, the owner and operator of the Oakland International Airport, was committed to keeping the airport and its terminals in top shape to accommodate its passengers while presenting a modern and clean aesthetic throughout.

Airports across the U.S. see significant traffic that wears on facilities, and especially on flooring. CRI classifies airports as severe to extreme end-use traffic areas, and the combined impact of foot and baggage traffic alone means that airport carpets often have a shorter serviceable life. ^[3] Thus, in 2023, the Port turned to ongoing partner **Hoem & Associates** to assist with updating Terminal 1's flooring as part of a larger overhaul of the 50,000-foot terminal—the largest and most active at the airport.

Sean Hogan led the project on behalf of Hoem, using his considerable knowledge of both flooring and the airport itself. He had been involved in every carpet installation at the Oakland International Airport for the last 30 years and knew without question the right carpet vendor for the project. The current carpet in Terminal 1, Milliken's Ghost Artist collection, was installed more than a decade ago and had lasted well past typical service cycles. "When it came time to replace the carpet in Terminal 1," Sean said, "Milliken was the clear choice."

There is a long history between Hoem and **Milliken & Company**, a diversified global manufacturer with materials science expertise across various industries, including floor covering. Given its wearability and durability, Sean used Milliken carpet for each of the four installs he completed for the Oakland International Airport. Sean knew that sourcing Milliken carpets was the right move for this terminal overhaul, but what to do with the old Milliken carpet his team would remove?



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THE CHALLENGE

In the last 13 years, the landscape of sustainability has changed dramatically. There is more of an urgency to consider the post-consumer life of all products, and carpet is no different.

Carpet offers a number of consumer benefits—underfoot comfort, safety, aesthetics, and sound and ambient noise control all can be enhanced by sourcing carpet for commercial interiors. Yet, the EPA estimates that more than 4 billion pounds of carpets enter the U.S. solid waste stream each year, totaling more than 1% by weight of all municipal solid waste. Carpet is bulky, too, with post-consumer carpet accounting for about 2% of all municipal solid waste. ^[4]

Milliken draws on its materials science expertise to extend the life of its modular carpets, which then decreases the amount of carpet ending up in landfills. A hallmark of Milliken's carpet portfolio is its cushion backing—a designed layer built directly into the carpets to enhance insulation, comfort, acoustics, and, importantly, wear performance. With its proprietary cushion backing, made of up to 90% recycled materials, Milliken's cushion-backed carpets last 40-to-50% longer than hardback carpets with typical severe traffic wear rating.

Milliken's cushion-backed carpet rose to prominence in airport interiors back in the early 1990s. The cushion back absorbed much of the weight impact in the Hartsfield-Jackson Atlanta International Airport, which extended the life of the yarn surface layer. Because of the hard backing used by competitors, the yarn surface layer of those carpets absorbed the impact, resulting in faster and more visible carpet wear and necessitating more frequent replacement cycles. Soon, Milliken carpet could be spotted at airports across the U.S.—with the Oakland International Airport sourcing its first Milliken carpet in the early 1990s.

Using Milliken carpet meant that carpet changes at the Oakland International Airport were largely driven by aesthetics rather than poor performance or product failure. Terminal 1's current Milliken carpet lasted 13 years, nearly twice the expected airport carpet lifecycle. The extended life of Milliken carpet was a considerable sustainability win by itself.

Because sustainability was a key priority for everyone involved in the Oakland International Airport Terminal 1 flooring update, Milliken and Hoem were eager to offer a new post-consumer solution. And given California's extended producer responsibility laws enacted in 2022, the project was mandated to keep as much old carpet out of the landfill as possible.

THE SOLUTION

“Sustainability went from ‘nice to have’ to now a part of every product and process we are a part of,” remarked Joseph Barbareo of [Ascend Performance Materials](#)—a supplier of Milliken and the critical circularity link of the Oakland International Airport carpet install project.

Ascend Performance Materials, a fully integrated solutions provider that develops high-performance materials, acquired a majority stake in an innovative start-up now called [Circular Polymers by Ascend](#). Since 2018, Circular Polymers has provided an alternative recycling pathway that mechanically recycles carpet of any fiber type with upwards of 95% efficiency. Circular Polymers returns roughly 95% of the carpet volume it processes to useable post-consumer material, making recycled calcium carbonate, nylon, polyester, and polypropylene available to Ascend Performance Materials and other buyers in the market.

Circular Polymers recycles post-consumer carpet “dirt and all” while decreasing the time, transportation, and energy costs associated with carpet recycling and returning viable post-consumer materials that can be used in new consumer goods. As a supplier, Milliken routinely sources Ascend fibers for its own products and knew about its investment in Circular Polymers. Milliken presented the idea to Hoem, and together, they approached Circular Polymers about recycling the old carpet coming out of Terminal 1. Circular Polymers responded with an enthusiastic yes.

The end-of-life pathway presented by Circular Polymers aligned the values of everyone involved. Hoem has a sustainability pledge to reuse or recycle all carpet they pull up and diligently adheres to the state’s extended producer responsibility laws. The Circular Polymers partnership strengthens the connection between Milliken and Ascend, longtime sustainability leaders in their respective spheres, and closes the circular loop for its carpet. “We pride ourselves on supporting our customers with integrated systems and mindful products,” added Sarah Enaharo, Global Sustainability Director for Milliken’s Floor Covering Business. “Beyond the net-zero gains we can realize with a partnership like this—directly advancing our own [Science Based Targets initiative-verified net-zero targets](#)—we are demonstrating that the circular economy for carpets is possible and attainable.”

With an eye on circularity at the beginning and end of the project, Hoem and the Oakland International Airport selected [Milliken Motionscape](#) for the new Terminal 1 flooring. With the added benefit of a colorway that would hide soiling well, Motionscape delivered functionality with sustainability and circularity in mind. Offering Milliken’s performance-driven cushion backing and soil-release technology, Motionscape carries an Environmental Product Declaration and Health Product Declaration that can contribute to LEED certification, and a Declare® transparency label complying with the Red List Imperative of the Living Building Challenge. It is Cradle-to-Cradle Silver certified, with 41% recycled content included, and is carbon neutral as part of [Milliken’s M/PACT program](#).



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Sarah Enaharo
Global Sustainability Director for Milliken’s Floor Covering Business



Milliken

THE RESULTS

Hoem installed Motionscape seamlessly in Terminal 1 over nine days with no significant downtime and only minor terminal interruptions. Over 50,000 square feet of old carpet—roughly 15,000 pounds—went to Circular Polymers for recycling. Motionscape, comprising 41% recycled content, now continues Milliken’s product legacy of durability, serviceability, and sustainability that Oakland International Airport has come to rely on.

Joseph with Ascend summed it up best: “Milliken believes in building a product that lasts. Now, it can continue to last even in its post-consumer life.”

Milliken is actively exploring how the company can incorporate Ascend’s recycled fibers into its innovations, inviting further circularity into Milliken’s current portfolio. Circular Polymers by Ascend and Milliken are keen to partner on future projects in California and look forward to the day when this novel recycling process expands its service area beyond California.

The Motionscape installation is part of a broader terminal overhaul that aligns with the Port of Oakland’s sustainability initiatives—including its carbon emission-reduction goals. This project incorporated sustainable design frameworks, like LEED principles, from the beginning. Expanding the project scope to include a circular end-of-life option for the outgoing carpet aligned with the Port’s sustainable mindset, while increasing the value chain’s overarching carbon footprint.

The true success story of this project is reflected across the value chain. Closing carpet’s circularity loop with roughly 95% of the original material returned to the marketplace is a milestone worth celebrating. Harnessing a carbon-neutral carpet that meets or exceeds the sustainability and wellness metrics of the day translated to tangible value for Milliken’s customers and end users. And collaborating with the industry to envision a process where this happens showcases our collective ability to solve challenges together.

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Joseph Barbaree
of **Ascend Performance Materials**

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