WHITE PAPER

Beyond the Gate

How Leading Airports and Lounges Are Turning Nature Into Competitive Advantage

The Case for Biophilic Design in Aviation and Transportation Environments

Executive Summary



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THE ART OF PRESERVED NATURE

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Executive Summary

The Revenue Problem No One Is Designing For

Non-aeronautical revenue - retail, food and beverage, lounge access, and concessions - now accounts for 40 to 60 percent of total airport income at major international hubs. This market is valued at approximately $62 billion globally in 2024 and projected to reach $133 billion by 2034.[1, 2] The single largest variable determining how much of that revenue any passenger spends is not the product mix, the brand portfolio, or the digital pre-order platform. It is how that passenger feels.

Dwell time in terminal retail zones is the primary documented driver of non-aeronautical commercial performance. [3] A passenger under stress moves toward the gate. A passenger who feels at ease explores, shops, eats, and lingers. The environmental quality of a terminal is not a design preference - it is a revenue variable. Most airports are not yet managing it as such.

81%
of air travelers report at least some travel stress [10]

40-60%
of major airport revenue from non-aeronautical sources [2]

$133B
projected non-aero revenue market by 2034 [1]

20 MIN
of nature exposure measurably reduces cortisol [4, 5]

The Science: Brief Encounters Have Real Effects

Research from Harvard, Frontiers, and Cornell consistently demonstrates that even brief contact with nature - as little as 10 to 20 minutes - produces measurable reductions in cortisol and perceived stress.[4, 5, 6] UCL-linked research applying a Stimulus-Organism-Response framework to Jakarta Terminal 3 documented that visible indoor plants directly influence emotional response and perceived comfort in airport settings.[13] Studies in Malaysian and Saudi airports further confirm that biophilic design improves both passenger well-being and brand engagement - a finding with direct commercial implications. [7]

A passenger whose stress is moderated by the environment is not simply more comfortable. They are more commercially available.

Nature exposure suppresses sympathetic nervous system activation - the fight-or-flight response that drives passengers toward the gate and away from the concourse. Environments that reduce this activation measurably change the behavioral profile of the people within them.

Biophilic Design: Four Pathways to Passenger Recovery

Stress Reduction Cortisol reduction in as little as 10–20 minutes of nature exposure.[4, 5, 6]
Autonomic Regulation Suppressed fight-or-flight response; passengers shift from vigilance to exploration.
Cognitive Restoration Natural cues restore directed attention depleted by wayfinding and queuing. [6]
Brand Engagement Biophilic environments improve passenger well-being and commercial engagement simultaneously. [7]

Documented Outcomes in Aviation Environments

Changi Terminal 2: biophilic design as central brand identity [17]	Portland Int'l: mass timber, daylight, canopy-like calm throughout terminal [6]
Heathrow T3 Garden Gate: targeted installation shifts gate area emotional tone [16, 19]	BNA Nashville: world's two largest preserved gardens, 105 ft each, 200K sq ft lobby
Al Mourjan, Hamad Int'l: nature-anchored lounge, 2025 Skytrax Best Business Lounge [23]	Newark United Club: geometric preserved botanical planters by Garden on the Wall® [25]

The Lounge Standard: Where Biophilic Design Is Now Expected

The premium airport lounge has become the most competitive design typology in commercial interiors. Passengers now expect environments that feel residential, curated, and calmer than the general terminal - and operators are responding. The Delta One Lounge at JFK (2024) anchors its wellness focus in natural light, wood, and spa-grade recovery spaces. [22] The JPMorgan Chase Sapphire Lounge at LaGuardia embeds biophilic park references directly into its architectural concept. [21] Gensler's 2025 reporting documents the rise of outdoor spaces, rooftop gardens, and nature-integrated zones across major U.S. airports - now treated as wellness amenities for all passengers. [24]

Implementation Quality: The Specification Problem

Not all green-looking interventions are genuinely biophilic. The specification decision determines whether a nature investment produces measurable outcomes - or quietly undermines them.

	Faux Greenery	Living Plants	Preserved Gardens
Biophilic Benefit	None - synthetic	Authentic	Authentic
Restorative Credibility	Undermined over time	High	High
Maintenance	Dust accumulation	$90K-$120K/yr	Zero
Aviation Suitability	Poor	Complex infrastructure	Optimal
Lifespan	6-8 years	Variable	20+ years
Total Cost of Ownership	Lowest upfront, higher long-term with replacements	Highest overall	Lowest overall

Preserved Gardens: The Middle Path Aviation Needs

Preserved botanical installations originate from real natural matter - real moss, real botanicals, real lichen - processed and stabilized to perform without maintenance in the most demanding commercial interiors. They require no watering, drainage, grow lighting, or scheduled horticultural intervention. They do not wilt, shed, or introduce biological material into controlled environments.

For aviation and lounge environments where maintenance access is constrained, security limits who can work in the space, and long service intervals are the operational reality - preserved gardens are the most appropriate biophilic solution for environments that cannot afford to compromise.

Garden on the Wall® - The Only Fully Verified Option

Garden on the Wall® is the pioneer and leader in preserved garden, moss wall, planter insert, and preserved draping foliage installations for commercial interiors - trusted by Google, Microsoft, Amazon, Mayo Clinic, Memorial Sloan Kettering, Hilton, Marriott, and hundreds of others. With 2,040+ installations across 196,000+ square feet and 60+ Fortune 500 clients, Garden on the Wall® is the only preserved garden provider in the world with a published EPD (Environmental Product Declaration) with complete lifecycle environmental impact data, as of 2026.

7-year Warranty
20+ year product lifespan

Zero Maintenance
No Water, light, or care required

EPD Published
Negative cradle-to-grave carbon

Complete Verification
HPD • Declare • CDPH• ASTM E84

Download the full white paper with complete research citations, detailed ROI calculations, and implementation guidance at gardenonthewall.com. Request samples through Material Bank · CEU available through Architectural Record's Continuing Education Center (AIA/IDCEC/GBCI accredited)