

A photograph of a modern office interior. In the foreground, a woman in a yellow top is seated at a desk, writing in a notebook. To her right, another woman in a red dress is seated at a desk, looking at a computer monitor. In the background, two men are standing near a desk with multiple monitors. The office has a high ceiling with exposed ductwork and lights, and large windows on the right side. A red semi-transparent banner is overlaid on the image, containing the text "DESIGN IMPACTS LIVES".

DESIGN IMPACTS LIVES

AMERICAN
SOCIETY OF
INTERIOR
DESIGNERS



RESEARCH

ASID HQ OFFICE RESEARCH

Pre-/Post-Occupancy
Analysis 2017



In May 2016, the American Society of Interior Designers (ASID) moved into its new corporate headquarters (HQ), a living laboratory for the design community.

Overview

Background

Research Highlights

Design improves
environmental quality.

Design impacts the experience.

Design helps achieve results.

Design lives on.

The ASID Research team partnered with Cornell University, Delos, and the Innovative Workplace Institute to conduct a comprehensive pre- and post-occupancy study of the ASID HQ examining how workplace design impacts health, wellness, employee satisfaction, and work performance. The study began in 2015 and included four independent research projects (one from each respective partner) to accomplish the study's overall research goals: 1) investigate the impact of innovative workplace design on work behavior and performance; 2) examine how spatial design supports organizational goals and work requirements; and 3) demonstrate the impact of design on human sustainability, organizational sustainability, and environmental sustainability. This overview synthesizes the highlights from each of the research projects included in this comprehensive study to tell the ASID HQ story.

Research highlights include:

- Office design improves indoor environmental quality, environmental satisfaction, employee health and wellness, employee retention, employee performance, and resource efficiency.
- Office design shapes the social environment and boosts employee performance.
- Office design, especially when job demands or office culture support the messages communicated through the design, intensifies the power to make cost savings.

This research was funded in part by the generous support of the ASID Foundation.

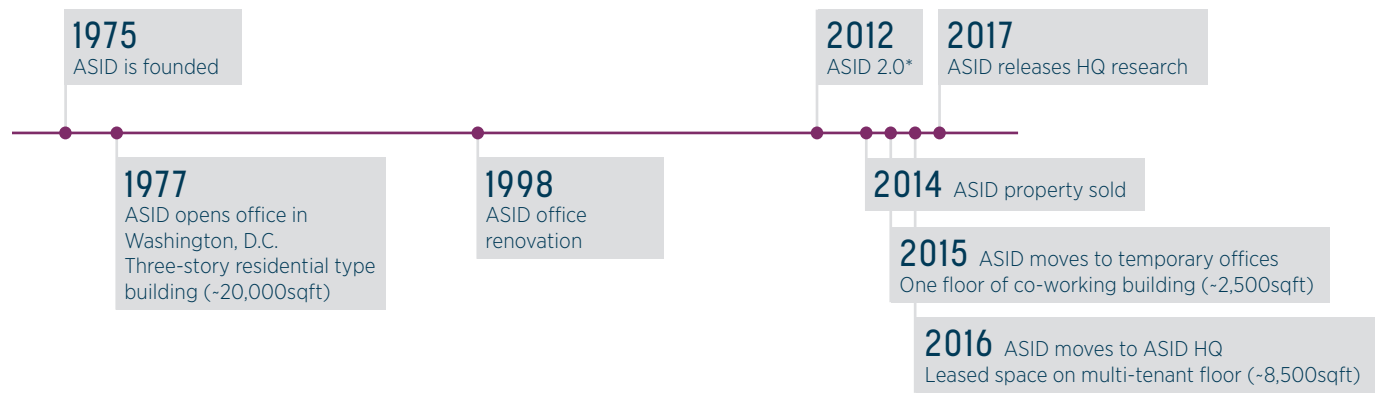
BACKGROUND

The previous ASID office opened in 1977 and occupied a three-story single occupant building on Massachusetts Avenue in Washington, D.C., which was renovated in 1998 to include high partition cubicles, private offices, and formal meeting spaces. In 2012, the ASID National Board of Directors made the decision to sell the property rather than commissioning another renovation project. The property sold before ASID had acquired new office space, providing the opportunity to test out a different setting before determining a long-term future workplace. ASID rented workspaces at a co-working office (previous interim office), shrinking down to about ten percent of the space it formerly occupied. By testing workspace extremes and taking an innovative approach to work, ASID found a solution on 15th Street in Washington, D.C. (current office) that not only fits its current needs, but also has the agility to accommodate unpredictable changes in the future. Along this journey, ASID re-examined its work and work processes, and put research into practice by conducting a pre- and post-occupancy study of the office.

ASID represents the industry through cross-functional and interdisciplinary relationships among designers of all specialties, including workplace, healthcare, retail and hospitality, education, institutional, and residential. Through education, knowledge sharing, advocacy, community building, and outreach, ASID strives to advance the interior design profession and, in the process, to demonstrate and celebrate the power of design to positively change people's lives. It leads interior designers in shared conversations around topics that matter: from evidence-based and human-centric design to social responsibility, well-being, and sustainability. ASID showcases the impact of design on the human experience and the value interior designers provide.



HISTORY OF ASID HQ OFFICES



**ASID National Board of Directors hires new CEO and proposes organizational change*

OFFICE DESIGN

Perkins+Will received the award to design the new ASID HQ office. The office is in a LEED-EBOM Gold-certified building, with several health and wellness amenities such as a building fitness center, showers, changing rooms, and rooftop patio. Once the space was acquired, the designers took the lead in engaging a team of consultants, including lighting, acoustics, biophilia, engineers, commissioning agents, building landlord, and general contractor to achieve all project goals.

PROJECT TEAM

- **Architect/Designer:** Perkins+Will
- **Project Manager:** Savills Studley
- **Real Estate Broker:** Savills Studley
- **General Contractor:** Rand* Construction
- **MEP Engineer:** GHT Limited
- **Acoustical Consultants:** Cerami
- **Lighting Consultants:** Benya Burnett
- **Biophilia Consultants:** Terrapin Bright Green
- **Commissioning Agent:** Bios

ASID took a comprehensive approach to pre- and post-occupancy research by incorporating the following interdisciplinary research projects that established design connections with organizational behavior, health, and other social sciences. Overall research goals included: 1) investigating the impact of innovative workplace design on work behavior and performance; 2) understanding how spatial design supports organizational goals and work requirements; and 3) demonstrating the impact of design on human sustainability, organizational sustainability, and environmental sustainability. Here is a synopsis of each research project with links to download the reports:

ASID: INTERNAL RESEARCH

The ASID Research team conducted a study that investigated organizational work behavior, work dynamics, and work performance as they relate to the office space.

Methods: Interviews with leadership, focus groups with each organizational department, behavior mapping in social spaces, employee surveys, indoor environment metrics (i.e., temperature, relative humidity, sound level, illuminance level, and carbon dioxide level), and space utilization data

Principal Investigator: Susan Chung, Ph.D., Senior Research Associate, ASID

Pre-Occupancy Data: July-August 2015

Post-Occupancy Data: July-August 2017

CORNELL UNIVERSITY: 3C DESIGN

The 3C design study collected social data on occupants' physical activity, speech activity (not language), proximity, and face-to-face interactions to examine workplace dynamics on connectedness, collaboration, and creativity.

Methods: Socio-metric data from badges worn by employees (including an accelerometer, Bluetooth, infrared, and microphone that captures speech frequency, not language), and employee surveys

Principal Investigator: So-Yeon Yoon, Ph.D., Associate Professor, Cornell University, College of Human Ecology, Department of Design and Environmental Analysis

Pre-Occupancy Data: November 2015

Post-Occupancy Data: November 2016

INNOVATIVE WORKPLACE INSTITUTE: CAPTIW

The Comparative Assessment and Performance Tool for Innovative Workplaces (CAPTIW®), an open source assessment tool, generated an advanced workplace analysis on the impact of the performance of the physical workspaces on the organizational innovation strategies and innovation performance.

Methods: Online tool completed by ASID

Principal Investigator: Young Lee, Ph.D., Director, Innovative Workplace Institute

Pre-Occupancy Data: March 2016

Post-Occupancy Data: March 2017

DELOS: WELL BUILDING SURVEY

The Delos Insights – Applied Research Program provided a WELL Pre-/Post-Certification Survey analysis report focused on occupant environmental satisfaction and health.

Methods: Employee surveys

Principal Investigator: Whitney Austin Gray, Ph.D., Senior Vice President, Delos

Pre-Occupancy Data: April 2016

Post-Occupancy Data: April 2017

RESEARCH HIGHLIGHTS

Each research project provided insight on the role of workplace design and its impact on employees and their work. The projects reported on how ASID employees worked in the co-working office, how they work at 15th Street, and any differences that exist. Taking the key findings from each research project into account, here are the highlights on how the current office demonstrates the impact of design.

 Design improves environmental quality.

Health and sustainability is at the heart of the 15th St. office design. Recognizing the impact physical surroundings have on human health, ASID relied on existing research and standards to design a healthy office that is a living and learning laboratory for the design industry. As the world's first space to achieve both LEED-Platinum (v.3) and WELL-Platinum (v.1) certifications, the office is not only validated by third-party institutions as a healthy and sustainable office, but supporting data from pre- and post-occupancy research projects further confirms improved environmental quality and enhanced employee satisfaction on environmental conditions.

ASID HQ OFFICE AT-A-GLANCE*

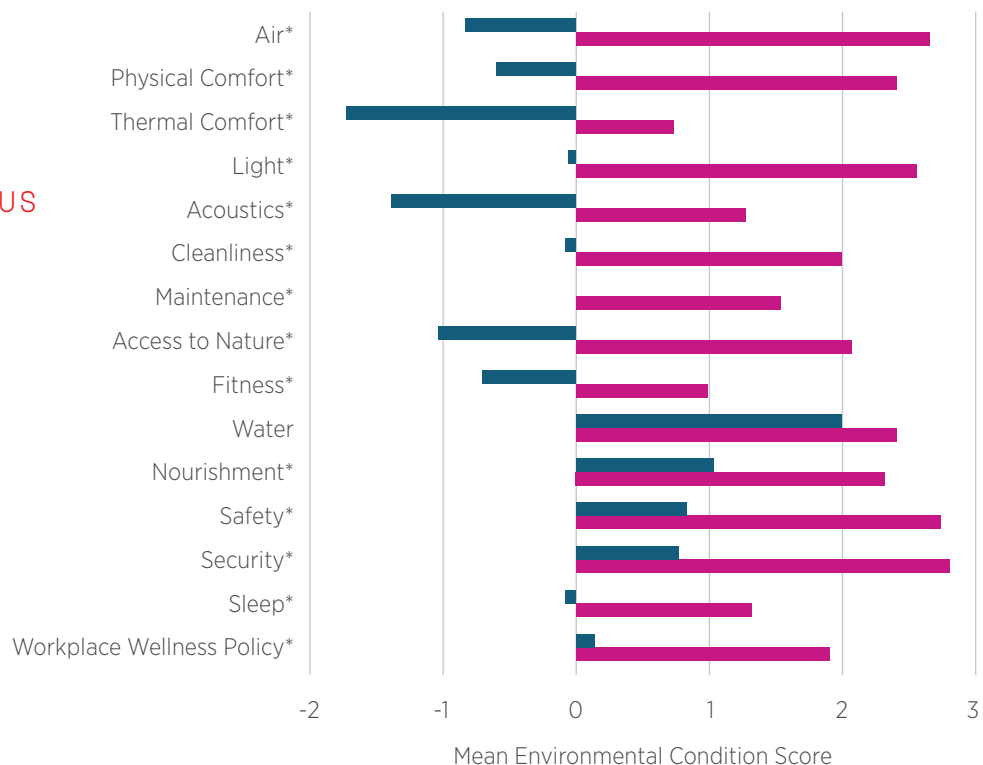
	CO-WORKING OFFICE	15TH ST. OFFICE	
Temperature	23.2° C	23.8° C	
Relative Humidity	45.5 %	38.0 %	
Loudness	72.1 dB	60.8 dB	50% reduction in loudness
Work Surface Brightness	271.6 lx	441.6 lx	63% brighter
CO ₂	1427.5 ppm	596.3 ppm	58% reduction in CO ₂ level

*Average of measurements taken at workspaces at 10:30 a.m., 1:30 p.m., and 4:30 p.m. during one week in Nov. 2015 and Nov. 2016 (15th St. office CO₂ levels measured in May 2017 due to system error in Nov. 2016)

ENVIRONMENTAL CONDITION SATISFACTION SCORES BY OCCUPANCY STATUS

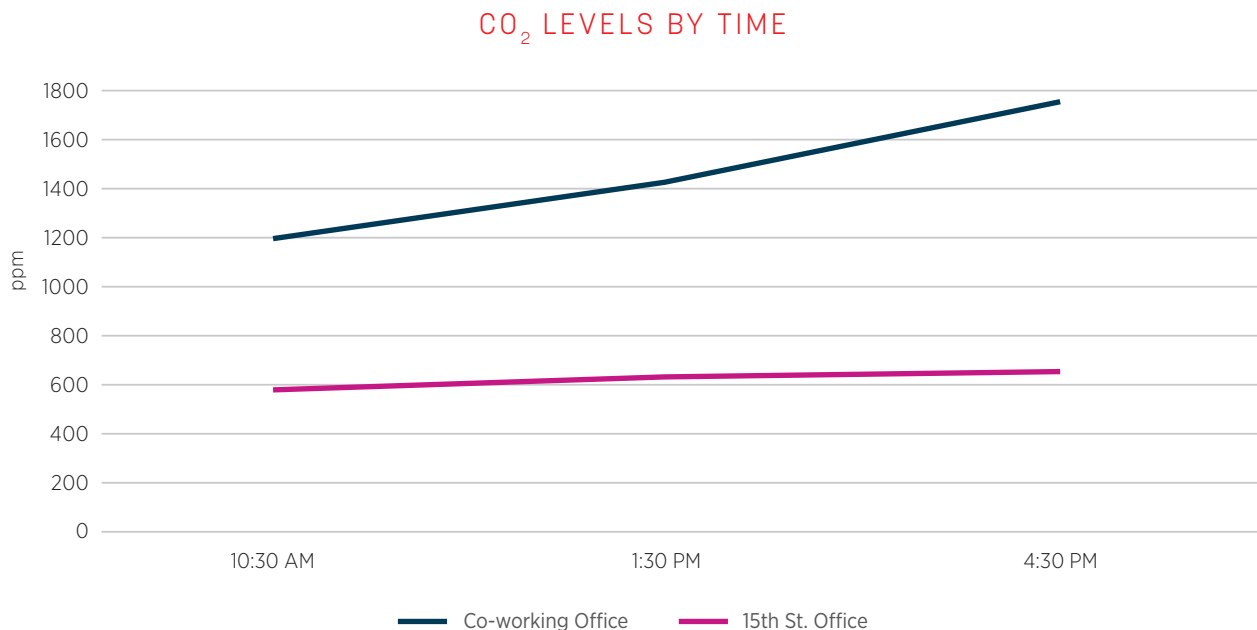
■ Pre-certification
■ Post-certification

*Indicates a statistically significant difference ($p < .05$) between the pre-certification space and the post-certification space.



INDOOR AIR QUALITY

ASID implemented design strategies such as a VOC reduction design that required product finishes, interior paints and coatings, and interior adhesives and sealants to meet multiple standards; an air filtration design that purifies outdoor air and recirculated air; and a ventilation effectiveness design that regulates the ventilation rate of outdoor air to keep carbon dioxide (CO₂) levels in the space below 800ppm. As ASID was monitoring environmental metrics in the office, higher CO₂ levels than the threshold were observed for a few days in November 2016. After investigation, ASID found the outdoor air return was not functioning as designed due to a system error that the building operators were quickly able to correct.



Performance verification tests confirmed the 15th St. office was below the threshold limit set by the WELL Building Standard for formaldehyde, total VOCs, carbon monoxide, PM2.5, PM10, and ozone levels. The average CO₂ level in the overall office in July 2017 was 570ppm during the time of typical occupancy (Monday – Friday, 5:30 a.m. to 7 p.m.), which is similar to the CO₂ level that showed highest cognitive performance in a 2016 research study¹. This reading is 2.5 times less than the CO₂ level measured in the co-working office. Survey results show an increase of 110 percent satisfaction in air quality compared to the co-working office.

LIGHTING

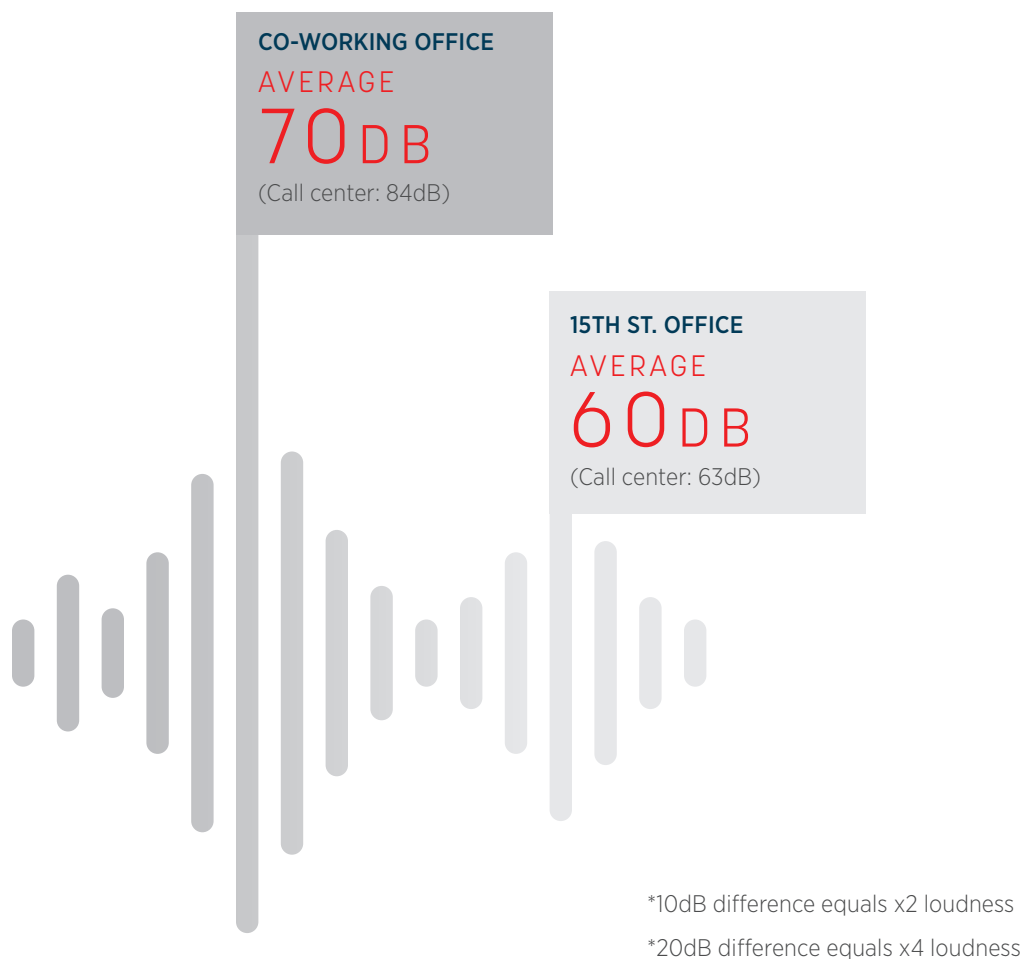
Survey results indicate that all ASID employees have knowledge of circadian lighting and its effects on their health and well-being, and 25 percent of employees attribute circadian lighting at the 15th St. office for their enhanced sleep quality. The design team's lighting consultants designed a circadian protection lighting system to ensure ASID employees continue to stay entrained to the natural daylight cycle, even indoors. Taking into account biologically relevant light quality including color temperature, intensity, duration and timing, light fixtures house specialized cool (5000K for day) and warm (2700K for early evening) fluorescent lamps, not designed to mimic local outdoor lighting conditions, but rather programmed to a customized wellness protocol designed to protect occupant circadian system biological response to electric light across all working hours with latitude-specific seasonal solar angles, geographic location, and yearly local cloud cover also taken into consideration.

Different methods exist when measuring circadian lighting, but according to the WELL performance verification, 81 percent of the tested locations exceed 250 EML (Equivalent Melanopic Lux)² even on an overcast day.



ACOUSTICS

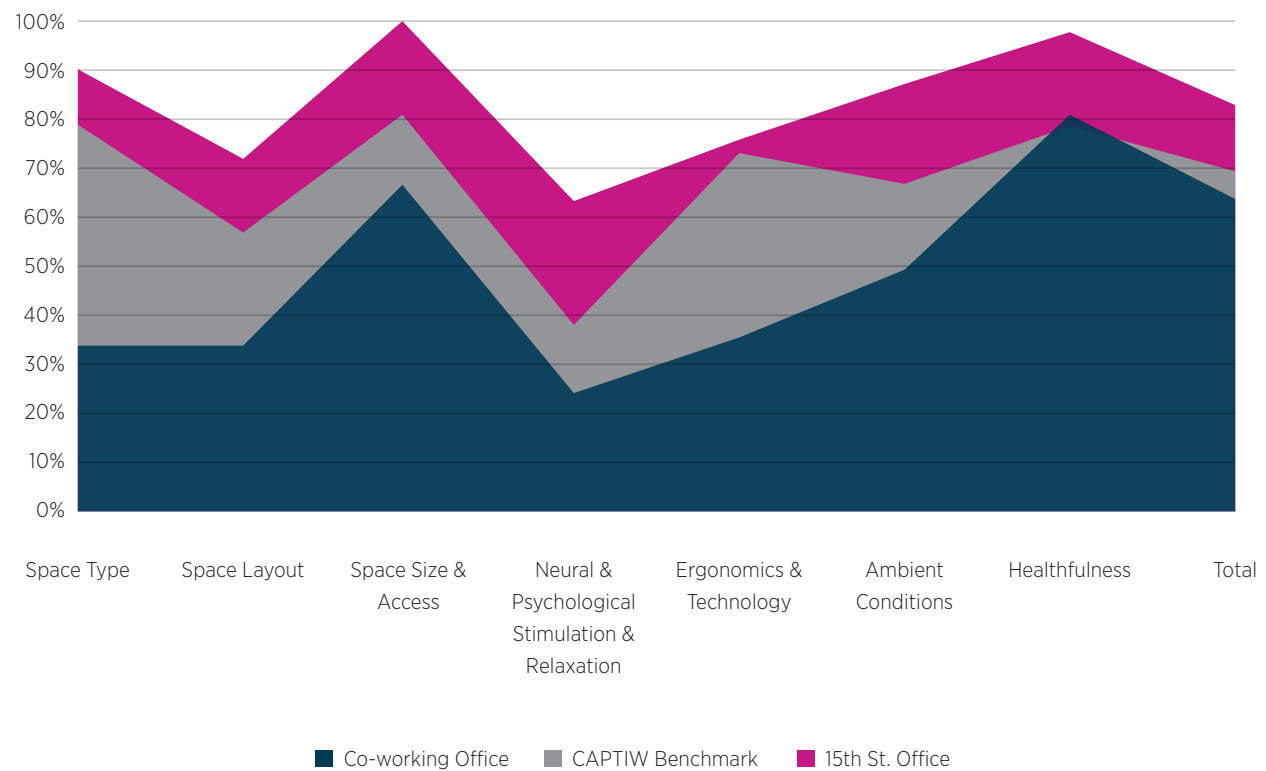
The average sound pressure levels (dB) measured in the 15th St. open office during typical work conditions reduced significantly—measurements were half the loudness in the open office compared to the co-working office. Our call center receives approximately 4,000 calls per month, and sound levels in the call center reduced to a quarter of what they were when specifically comparing them to the previous workspace.



Interestingly, the data shows that ASID employees speak in a softer voice than when they were in the co-working office, and ASID employees say the sound masking system does a pretty good job in cancelling noise and enabling speech privacy at the 15th St. office. Satisfaction with reduced noise and speech privacy increased significantly, with overall satisfaction in acoustical quality improving 92 percent. The design team's acoustical consultants considered the different sources for noise and created a design to provide acoustical comfort appropriate to each of the spatial zones. Strategies include space planning, material selection, and a sound masking system in the open office (46dBA).

SPATIAL QUALITY

The design of the 15th St. office has significantly improved the spatial quality overall. ASID assessed its office using the CAPTIW© worksheet³, which analyzes the performance of physical workspaces in relation to organizational innovation strategies and innovation performance according to seven key performance indicators identified by research: 1) space type, 2) space and furniture layout, 3) space size and access, 4) neural and psychological stimulation and relaxation, 5) furniture ergonomics and technology, 6) ambient conditions, and 7) healthfulness.



The 15th St. office scored an 83.9 percent of the total 100 points possible, with top indicators being space size and access (100%), healthfulness (98.8%), and space type (91.7%). All indicators are a significant improvement compared to the co-working office, and higher than the benchmark scores—further validating how exemplary the 15th St. office is compared to others. However, the tool identified several areas in need of improvement, such as having more low-tech collaborative tools in the open workspace and recharge spaces for play. Additionally, ASID employees mentioned the need for heads-down space that does not allow disturbance. Although the private offices provide quiet individual work, the glass doors keep the occupant visually connected to the rest of the office allowing for disruptions and affording visual distractions.



Design
impacts the
experience.

Design impacts the intangible, such as the experience people have in the space. ASID employees' experiences in the office are influenced by multiple factors including the individual design components (e.g., lighting, acoustics, color, texture, etc.), the space in its collective form, and the social environment generated by the occupants. Referring to humancentered design, ASID first examined its corporate identity, team roles, individual responsibilities, work processes, and work behaviors to ensure that its office was an extension of the organization. In doing so, the design of the 15th St. office had a resounding effect, generating more positive experiences than initially intended.

STIMULATES COLLABORATION

The 15th St. office is free address, enabling employees to choose their workstation each day. The unassigned seating arrangement sparks spontaneous interactions in the open office while offering opportunities to cross-pollinate among teams and to get to know each other on a social level. With this office layout, ASID work crossed over the tipping point to become more collaborative than concentrative. ASID employees rely more on having conversations in the office to get their work done (17 percent increase), especially since they are in close proximity. The office also plays a role in facilitating communication among employees and in supporting the sharing and exchanging of ideas.

71%
AGREE

My workplace helps
facilitate communication between
employees.
(39% agreed in the co-working office.)

83%
AGREE

I have access to spaces
that support the sharing and
exchanging of ideas.
(39% agreed in the co-working office.)



CONCENTRATIVE



INTERACTIVE & COLLABORATIVE

CO-WORKING OFFICE

53%

47%

15TH ST. OFFICE

44%

56%

CREATES ATTACHMENT

Humans spend about a third of their day, or half of their waking hours, in the office. During focus groups conducted at the co-working office, ASID consistently heard from employees that they didn't feel a sense of ownership or pride in their workplace due to it being a co-working space. These temporary conditions led to low scores on place attachment; however, these scores improved significantly after the move to the 15th St. office. ASID employees' satisfaction in several environmental conditions such as lighting quality, noise reduction, speech privacy, available space, visual privacy, and ease of interaction contribute to place attachment. Particularly, the significant effects between ease of interaction and place attachment suggest that workplace design plays a role in shaping a social environment that engages employees in the office.



PLACE ATTACHMENT
SCORES IMPROVED

69%

ESTABLISHES SUPPORT

The workplace is comprised of both the physical and social environment, and these two should naturally go hand in hand for the organization to thrive. At ASID, visual privacy and ease of interaction were identified as important factors leading to perceived social support in the office, measured by social attachment and perceptions of organizational (peer and supervisor) support, and these factors improved significantly in the 15th St. office. More interestingly, when ASID employees perceive social support in the 15th St. office, they tend to have higher job satisfaction, be more creative, and be more productive.



Visual Privacy



Ease of Interaction

SOCIAL SUPPORT

- Social attachment
- Organizational (peer & supervisor) support

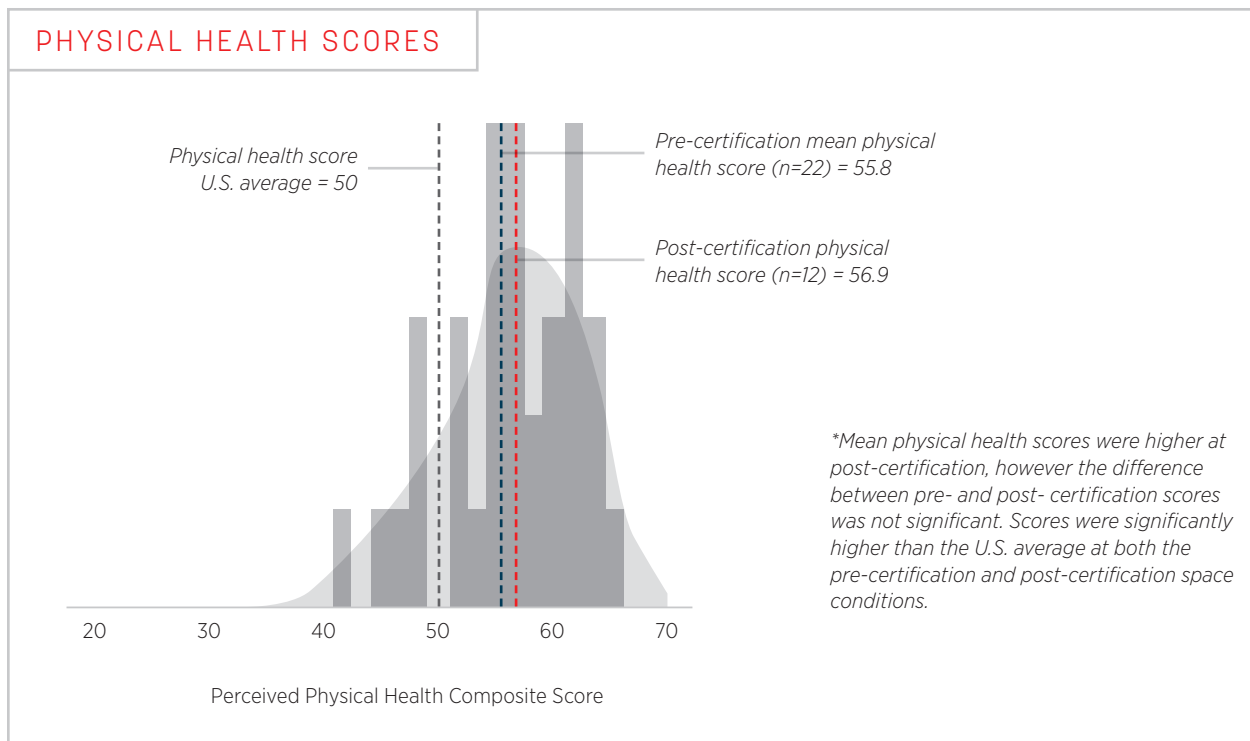


Design
helps
achieve
results.

Thoughtful design can support organizational priorities such as, employee health, productivity, and financial return. By incorporating multiple innovative features, design has positively affected the health and well-being of employees while boosting resource efficiency. The following highlights the initial research results from one year of occupancy and suggest positive outcomes will continue to be uncovered over time.

HEALTH

The health and wellness features in the 15th St. office enable and encourage healthy behaviors in various ways including access to a fitness center, sit/stand workstations, healthy snacks, filtered water and air, and a wellness room. The common areas are centralized in the office encouraging employees to take a few extra steps to access the copy room and café, which also happen to be the only two areas with trash bins. These examples and many others have resulted in a two percent improvement in physical health scores within a year of occupying the 15th St. office.

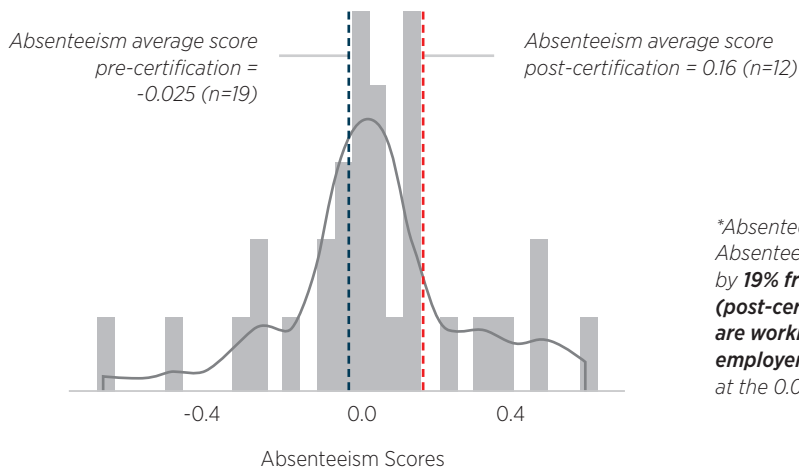


PRODUCTIVITY

The design standards applied in the 15th St. office guide ASID to achieve their goals in sustainability and employee health. Beyond these direct effects, ASID is seeing increases in several productivity measures alluding to the impact of design on productivity. Absenteeism scores (ranging from -1 to 1), measured by how much employees are working more than expected by their employer, improved by 19 percent. This moves the previous negative score (-0.025: employees worked 2.5 percent less than expected) to the positive range – the current score of 0.16 indicates employees are working 16 percent more than expected, which equates to 9.6 minutes more work completed per hour⁴. Presenteeism (ranging from 0 to 100) has also improved, indicating that on average, employees feel they are working at 90 percent of their possible job performance, which is a 16 percent increase to what was reported in the co-working office.

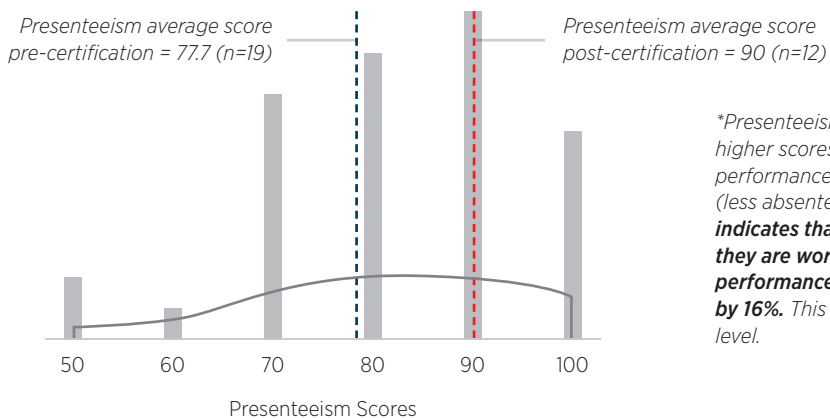
Satisfaction in visual privacy leads to perceived organizational productivity, which could mean that those who can tolerate the openness of the office can accomplish work more efficiently and effectively. Employees that rated higher on place attachment, perceived social support, stress tolerance, and interaction with others were also associated with higher productivity scores.

ABSENTEEISM



Absenteeism scores range from -1 to 1. Absenteeism scores improved (less absenteeism) by **19% from -0.025 (pre-certification) to 0.16 (post-certification), which indicates employees are working 16% more than expected by their employer. This increase is statistically significant at the 0.05 level.*

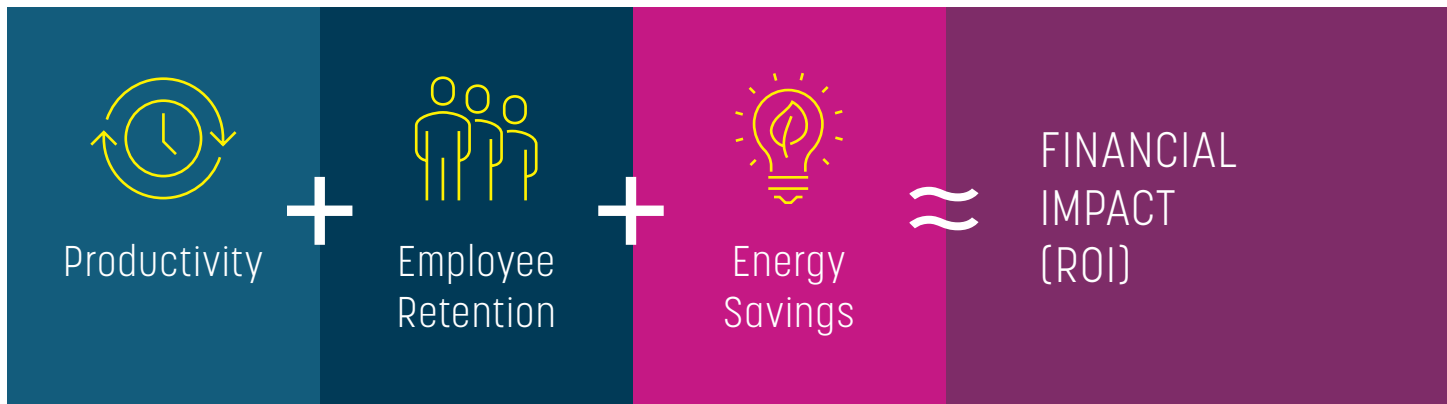
PRESENTEEISM



Presenteeism scores range from 0-100 with higher scores indicating higher self-rated work performance. Presenteeism scores improved (less absenteeism) by **16% from 77.7-90. This indicates that on average, employees feel they are working at 90% of their possible job performance, increasing their job performance by 16%. This is statistically significant at the 0.05 level.*

RETURN ON INVESTMENT

The impact of design resonates beyond the individual and to the organizational bottom line. Using a calculation determined by ASID, the financial impact to the organization's bottom line accounts for employee productivity, employee retention, and energy savings. Taking the average employee cost in Washington, D.C., including salary, benefits, overhead, and other costs, and applying the 16 percent productivity increase reported over the first year at the 15th St. office, calculations made by ASID indicate it will recoup its investment in the first half of its 10 year lease agreement.



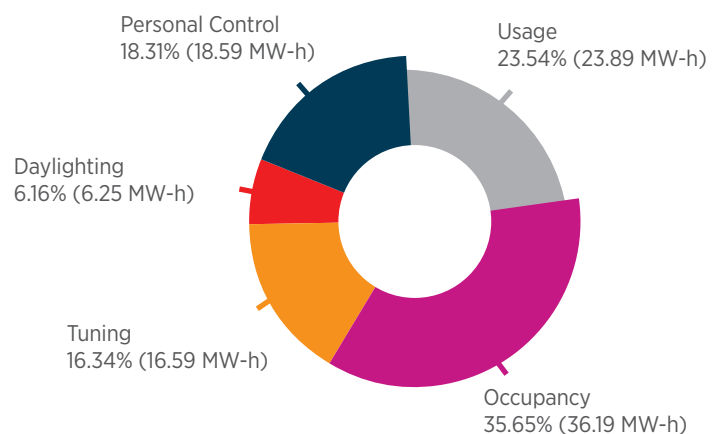
EMPLOYEE RETENTION

ASID expects the financial benefits to be even greater than the calculations on productivity alone. Findings from the 3C Design study confirm that perceived environmental quality has a significant effect on turnover intention, especially when controlling for job demands and control. Further investigation on this relationship uncovered environmental quality having a positive effect on employee retention, whereas job demands have negative effects. ASID has yet to translate this into an actual number, but the consensus from other studies⁵ suggest the cost savings from retaining an employee are remarkable. Office design, especially when job demands or the office culture support the messages communicated through the design, intensifies the power to make cost savings.

ENERGY SAVINGS

The research findings show the 15th St. office has saved over 76 MWh in lighting energy over the first fifteen months of occupancy, based on Lutron's Quantum® Green Glance® software. That amounts to \$7,635.60 in cost savings and more importantly, 38.2 tons of coal not burned and 72.9 tons of CO₂ not emitted into the atmosphere. We save 78.2 percent, on average, of the energy we would use each day if we were to have lights full on, using strategies like daylighting, tuning, occupancy sensors, and personal control systems.

ENERGY SAVINGS BY STRATEGY





Design
lives on.

The new ASID corporate headquarters on 15th St. is a living laboratory for the interior design industry. Equipped with sensors to monitor the indoor environmental qualities of the space in real time, and beacons to track how ASID employees are utilizing their spaces, this data has already helped ASID correct system errors and has sparked ideas on how to better use its space. The ASID HQ office is an example of how research data can be used in making good design decisions and demonstrating the value of design. The office research will carry on including periodic formal post-occupancy evaluations, and ASID will share updated findings as it continues to learn from its space. ASID looks forward to discovering how design impacts its life and how the future of its workplace will unfold over time.

For more details on the 15th St. office design, view the 3D virtual tour, read the 15th St. office case brief, and check out product details in the 15th St. office brochure – all available on asid.org.

Get detailed information by reviewing the research reports from [ASID Research](#), [Cornell University](#), [Delos](#), and the [Innovative Workplace Institute](#).

ABOUT ASID RESEARCH & KNOWLEDGE MANAGEMENT

ASID Research and Knowledge Management activities include both internal and external research, where the collection, organization, analysis, and dissemination of information about our members, programs, and on the broader interior design industry provide decision makers with reliable, unbiased information on the practice, business, and impact of design. ASID Research & Knowledge Management is committed to providing tools and resources to help the design community, and to identifying innovative projects to share as best practices for every sector. Contact research@asid.org for questions.

ABOUT THE ASID FOUNDATION

The American Society of Interior Designers Foundation (ASIDF) supports endeavors that capture and disseminate knowledge, encourage innovation, and benefit the health,

safety, and welfare of the public through interior design research, scholarships, and education. ASID Foundation initiatives include Transform, an applied research grant program, and partnerships with The 1+ program and the National Building Museum. Learn more at asidfoundation.org.

ABOUT ASID

The American Society of Interior Designers believes that design transforms lives. ASID serves the full range of the interior design profession and practice through the Society's programs, networks, and advocacy. We thrive on the strength of cross-functional and interdisciplinary relationships among designers of all specialties, including workplace, healthcare, retail and hospitality, education, institutional, and residential. We lead interior designers in shared conversations around topics that matter: from evidence-based and human-centric design to social responsibility, well-being, and sustainability. We showcase the impact of design on the human experience and the value interior designers provide.

ASID was founded over 40 years ago when two organizations became one, but its legacy dates back to the early 1930s. As we celebrate nearly 85 years of industry leadership, we are leading the future of interior design, continuing to integrate the advantages of local connections with national reach, of small firms with big, and of the places we live with the places we work, play, and heal. Learn more at asid.org.

FOOTNOTES

¹ Allen, J. G., MacNaughton, P., Satish, U., Santanam, S., Vallarino, J., & Spengler, J. D. (2016). Associations of cognitive function scores with carbon dioxide, ventilation, and volatile organic compound exposures in office workers: A controlled exposure study of green and conventional office environments. *Environmental Health Perspectives*, 124(6), 805-812. doi:10.1289/ehp.1510037

² The WELL Building Standards uses EML for measuring circadian lighting and requires more than 75 percent of tested locations to be above 250 EML to achieve the circadian lighting precondition feature.

³ The Comparative Assessment and Performance Tool for Innovative Workplaces (CAPTIW[®]) was developed by a collective effort among industry and academic partners with support from the American Society of Interior Designers Foundation (ASIDF) Transform Grant for research projects advancing the profession.

⁴ Fisk, W. J., & Rosenfeld, A. H. (1997). Estimates of Improved Productivity and Health from Better Indoor Environments. *Indoor Air*, 7, 158-172. doi:10.1111/j.1600-0668.1997.t01-1-00002.x

⁵ e.g., Bersin, J. (August 16, 2013). Employee retention now a big issue: Why the tide has turned. LinkedIn: <https://www.linkedin.com/pulse/20130816200159-131079-employee-retention-now-a-big-issue-why-the-tide-has-turned/>; Boushey, H., & Glynn, S. J. (November 16, 2012). There are significant business costs to replacing employees. Center for American