The NIBS Low Vision Design Committee

An Overview

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NIBS Low Vision Design Committee
Abstract

NIBS formed the Low Vision Design Committee (LVDC) in November 2011, based on a recommendation from the 2010 NIBS Workshop on “Improving Building Designs for Persons with Low Vision.” The Committee organized this Symposium and is meeting, this afternoon, for the third time. It now has more than 20 members including architects, engineers, lighting and interior designers, clinicians, researchers and educators, and representatives of facility owners and managers. They are working in three interdisciplinary teams: 1) Codes, Standards and Guidelines; 2) Research and Development; and 3) Outreach and Education. This is an open committee and others are welcome to join.

Introduction and Issues

“We don’t see with our eyes, we see with our brains.”
Americans with Disabilities Act of 1990 (ADA) require accommodations for legally blind persons (i.e., visual acuity $\geq 20/200$ or visual field $\leq 20$ degrees in better eye) but not for other persons with low vision and related impairments. Current building codes, standards, and regulations do not address accommodations for persons with low vision and related visual impairments. Moreover, mandated reductions in building energy use can compromise health and safety of occupants in the visual environment.

Foundation of the Low Vision Design Committee

To address these issues, NIBS formed the Low Vision Design Committee (LVDC) based on a recommendation from the Workshop: “Improving Building Designs for Persons with Low Vision.” This Workshop was conducted by NIBS in September 2010 at the request of Vijay K. Gupta, Chief Mechanical Engineer in the Office of Design and Construction, Public Buildings Service, U.S. General Services Administration. This request derived from his long-standing commitment to improve the performance of public and private buildings through excellence in design and operations. This Workshop was the last in a series of 18 that he conducted through the HVAC Excellence Program, which he initiated in 2002. The premise for the Workshop was based on the following evidence:

- For 20 years, two strong driving forces have influenced the design and performance of these public buildings [4]:
  1) GSA’s Design Excellence philosophy “to provide dramatic improvements in the design, preservation, and construction of federal buildings.”
     - HVAC Excellence Design reviews revealed substantial increases in daylighting and corresponding impacts on thermal loads; and
  2) Federal mandates to significantly reduce the consumption of energy in these buildings [4, 5].
     - HVAC Excellence Design reviews revealed lowered allowable electrical power requirements and corresponding reductions in illumination levels.

- As discovered in Post-Occupancy Evaluations (POEs) that were conducted under Gupta’s supervision, these driving forces resulted in less than expected improvements in occupant satisfaction with regard to perceptions of thermal and IAQ conditions, acoustics, lighting, and accessibility [6].

- Subsets of “low vision” occupants were not surveyed or interviewed during the POEs. However, Gupta’s personal condition of low vision increased the awareness of the POE team members to glare, accessibility, and related design issues that must be addressed, especially in public spaces such as entrance lobbies, atriums, and corridors, to accommodate the visual requirements for safety and well-being of all persons in these environments.

For the first meeting of the LVDC, a Concept Paper was prepared in October 2011 by a steering
committee to address and analyze issues and knowledge gaps that were identified during the Workshop, and to propose plans to address them through evidence-based improvements in designs and operational procedures for new and existing buildings [7]. Analysis indicated that four major learning outcomes were expressed by the participants of that interdisciplinary Workshop:

1. Clinicians need a better understanding of lighting and accessibility exposures that “low vision” patients experience while in “built environments.”
2. Designers need a better understanding of the lighting and accessibility needs of “low vision” persons while in “built environments.”
3. A common vocabulary is needed for clinicians, design practitioners (e.g., architects, interior designers, lighting designers, engineers), building owners and managers, and policy makers for all built environments.
4. There is a need to balance federal and other mandates for reduced energy consumption against the needs of all building occupants, including people with low vision, to have adequate illumination.

A set of short, intermediate, and long term plans was proposed in the Concept Paper as guidance for development of the LVDC.

Organization and Activities of the LVDC

An organizational meeting of the LVDC was held on 3 November 2011 through the generous support and encouragement from the Hulda B. and Maurice L. Rothschild Foundation, and its President: Dr. Robert Mayer. The following Mission Statement was recommended by the Committee at that meeting and subsequently approved by NIBS:

“The mission of the Committee on Low Vision Design is to address the needs of all occupants of the built environment, including those with low vision, through improvements in designs and operational procedures for new and existing facilities to enhance the function, safety, and quality of life. The Committee will identify existing knowledge and needs for further research to accomplish these objectives.”

The LVDC now has more than 20 members including architects, engineers, lighting and interior designers, clinicians, researchers and educators, and representatives of facility owners and managers. The LVDC is now functioning in three interdisciplinary teams:

Codes, Standards and Guidelines

The focus of this subcommittee is to coordinate with other codes and standards-writing organizations to assure that provisions for low vision occupancy are integrated into these documents. Recent activities include:
• Coordination of LVDC activities with those within the U.S. Access Board.
• Participation in reviewing and proposing revisions to three documents:
  o The 2010 *Guidelines for Design and Construction of Health Care Facilities* is being revised by the Facilities Guidelines Institute (FGI) for 2013. A new Vol. 2 is being developed: *Design and Construction of Long Term Residential Health, Care, and Support Facilities*, which will include requirements for Independent Living Facilities, Assisted Living Facilities, Nursing Homes, Hospice Facilities, Adult Day Care Facilities, Wellness, Diagnostic & Treatment Facilities, and Rehabilitation Facilities.
  o ANSI/ASHRAE/IESNA 90.1-2010 (2014): *Energy Standard for Buildings Except Low-Rise Residential Buildings*. Currently, no illumination values are provided, and lighting power densities have been lowered without consideration of the low vision population. Members of the LVDC have recommended revisions to accommodate the low vision population.
• Development of a new NIBS *Design Guideline for Health and Safety in the Visual Environment*. Version 1 of this evidence-based guideline has been drafted and is now being reviewed by members of the LVDC. Version 2 for public review is planned for April 2013. The plan is to develop a Standard from this Guideline which can then be referenced in the forthcoming International Building Code in 2018. The Guideline will be continually updated based on new evidence.

Research and Development
The focus of this subcommittee is to identify research needs and develop projects to demonstrate improvements in visual environments that enhance the health and safety of occupants, including those with low vision. Recent activities include:

• Based on lessons learned from the Workshop, Dr. Robert Massof, Professor, Lions Low Vision Research and Rehabilitation Center, Johns Hopkins School of Medicine, submitted a research proposal involving five universities and NIBS to the NEI/NIH entitled: “*Computational Model of the Perception of Environments by People with Low Vision.*” It centered on building and integrating four models:
  o A physical model that measures and shows how environmental light impinges on the cornea from a set vantage point.
  o A computational model measuring how light is absorbed by the eye.
  o A computational model showing how light absorption is processed into visual sensation.
  o A computational model that allows observers to see optimal processing of different visual perceptions (including contours, depth, and patterns).

Although the proposal received favorable peer reviews, it did not survive the final round of review for funding. It is now being reviewed and revised for subsequent submittals.
• Committee members are compiling information regarding evidence-based data that can
be used in the development of the NIBS Guideline.

- Proposals have been submitted to two potential sponsors for support of the NIBS Guideline and Standard development.

Outreach and Education
The focus of this subcommittee is to increase general awareness about the importance of design for health and safety in the visual environment, and to develop educational programs that include new design, construction, and operational information on objective measurement and control of the visual environment.

Recent activities of this subcommittee include:

- Members have participated and presented in four seminars and symposium:
    - Dennis W. Siemsen, OD, presented the paper: “Improving Building Design for Persons with Low Vision.”
  - IES Symposium on Lighting and Senior Living, 6-7 March 12. Six members of the LVDC attended and participated in the symposium, in Washington, DC.
  - Seminars at AIA Annual Convention, 18 May 12.
    - Robert Dupuy and Eunice Noell-Waggoner addressed the topic of lighting for older people, and where ASHRAE standards stand on the topic.
    - John Eberhard addressed “Brain-Mind Connections to Architecture.”
  - IES Conference and Annual Meeting, 11-13 Nov 12. Three members of LVDC attended and participated in the Conference, in Minneapolis, MN.

- Invited presentations by Jim Woods have been given at:
  - AIA DC 2030 Challenge Seminar, 9 May 12, Washington, DC: “Building Skin – The Importance of the Thermal Envelope”
  - Two Lions Club Meetings at Springfield-Franconia, VA, Host Chapter on 13 Mar 12; and at Fairfax, VA, Host Chapter on 20 Nov12: “Improving Performance of Buildings for People with Low Vision.”
  - Westminster-Canterbury of the Blue Ridge, Charlottesville, VA: “Improving Performance of Buildings for People with Low Vision.” This Continuous Care Retirement Community has a Low Vision Residents Group with more than 80 resident members. They have indicated interest in participating in studies sponsored by NIBS. WCBR is now constructing a new addition.


- Sponsorship of this Symposium: “Creating Supportive Environments for Persons with Low Vision.”
  - The purpose of this symposium is to acquire information from several perspectives pertaining to the performance of buildings that are occupied by
persons with low vision.

- These perspectives include: architecture and design; medical; resource utilization (i.e., lighting, power and energy), and owner’s requirements.
- Evidence from these perspectives will be useful in planning further activities of the LVDC.

Conclusions

1. Nearly 20% of the people in the US over the age of 40 have chronic visual impairment.
2. Current codes and standards do not address accommodations for the visually impaired, except for those who are legally blind.
3. Interdisciplinary efforts are needed to develop criteria and standard methodologies for verifying building performance that involves the visual environment.
4. Improved control for health and safety in the visual environment will benefit all occupants and enhance environmental and economic sustainability.

References


