

## Good Show

### *Stadium-style Theater Seating Draws Applause in Maryland*

**W**hen Loews Cineplex Rio Cinemas in Gaithersburg, Md. decided to renovate its 14-theater facility a year ago, the management had more in mind than just a fresh coat of paint. Today the Cineplex Rio boasts stadium-style seating in 18 theaters, several universal design features, and the Pyramid Award from the Maryland's Montgomery County Commission on People with Disabilities.

According to some viewers with disabilities, most stadium-style theaters around the country locate their accessible seating too close to the screen for comfortable viewing and fail to provide easy access around the theater. These and other accessibility issues have prompted regional and national discussions by accessibility advocates, architects, designers and representatives of the motion picture and theater owners,

offering new insight into safe, comfortable and convenient access for people with disabilities. At the Loews Cineplex Entertainment corporate office in New York, executives decided to look beyond minimum ADA compliance to the concerns of its patrons with disabilities. Michael Norris, executive vice president of Loews Cineplex Entertainment, worked with Senior Vice President of Construction and Design John

See Stadium-style, page 14



The universal design of the seating accommodates a wide range of users.

## Access Board Issues Final Guidelines on Play Areas

**I**n October, the U.S. Architectural & Transportation Barriers Compliance Board (Access Board) issued final accessibility guidelines for newly built or altered play areas. The guidelines are one of the first of their kind in providing a comprehensive set of criteria for access to play areas.

Included in the guidelines is a requirement for surfaces that are maneuverable using a wheelchair, but soft enough to limit injury from falls. For wheelchair access, surfaces are required to be "firm, stable, and slip resistant" as specified in the Americans with Disabilities Act Accessibility Guidelines (ADAAG) and to meet the new ASTM standard F1951-99, which is based on a measurement of the physical effort to maneuver a wheelchair across a surface. Accessible surfaces within the use zone (the ground level area beneath and immediately adjacent to a play structure) are also required to be "impact attenuating" in compliance with ASTM 1292-99 requirements for drop testing. It's no longer enough to

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## Universally Accessible?

**Editor's Note:** *Universal Design Newsletter* Publisher John Salmen received the following e-mail concerning the Universal Designers & Consultant's website, [www.UniversalDesign.com](http://www.UniversalDesign.com). It provides an opportunity to address issues related to universal design and evolving technology.

**SUBJECT:** How can you claim to be Universally Accessible?

**Dear Universal Design,**

How can you claim to use Universal Design if you insist on the latest version of Netscape or IE? That is not accessibility. That is not Universal Design either. Should I mention the missing alt tags or the frames without title tags? Come on you can do a lot better.

*Mike Burks, Chairman Internet Society SIG for Access to the Internet for people with Disabilities and a Member of the Advisory Board Internat'l Center for Disability Resources on the Internet*

**Dear Mr Burks,**

Thanks for your recent e-mail message providing a critique of our website. We always appreciate feedback from our friends, clients and website visitors. Moreover, replying to your message gives me the opportunity to make an important distinction.

We would NEVER claim to be universally accessible!

Universal Designers & Consultants Inc. established the website, [www.UniversalDesign.com](http://www.UniversalDesign.com) website more than four years ago (before Bobby was widely available) and have made only minor updates to the system since then. We are planning a major revision this year, so your comments and

suggestions come at a great time.

Your comments, however, are even more important because of the wider issue they uncover – the enormous rate of evolution in the field of Universal Design. Our practice in the field of architecture (where the concept of Universal Design was born) has undergone significant change over the last 10 years. When we started publishing *Universal Design Newsletter* in 1993, an Internet search found no hits on the term “universal design.” A recent search on Alta Vista found 12,606 references, demonstrating the fact that people are uncovering valid new ways of applying and evaluating the concept.

The seven principles of Universal Design developed by Ron Mace are being stretched as bright new

minds are applying the concept to an ever widening circle of issues, from telecommunications and fashion design to urban design and wilderness trails.

What this has shown us over and over again is that there is only one absolute in Universal Design, which is: “no one knows it all.” We can all learn more about designing the environment to better meet the needs of the human condition.

That is why we would never be so presumptive as to use the term “universally accessible.” No one can be that definitive. That term came from an attempt in the late 1990s to mix accessibility requirements with the art of Universal Design. Accessibility requirements are mandatory legal minimum criteria, while Universal Design is (and we think should be) an ever evolving art.

The true spirit of the Universal Design movement is captured in the act of learning from each other – also known as user involvement. When we learn, our thinking changes and evolves. I have a growing appreciation for what Dr. Edward Steinfeld termed “Universal Design-ing” where the end result is less important than the process used to get there. User involvement in the design process may, in the long run, be more valuable than the actual result it produces. This is especially true as the results are judged by people coming after the design process who have higher and higher standards of what is “good design.” Inevitably, what was once thought of as being state of the art, is later found to be lacking in some newly discovered aspect of good design.

By nailing universal design to the standard of accessibility, we would establish a minimum level of acceptable universal design. We would say that this is good enough. It's all you have to do to be acceptable. With that act, we would ensure that people will never have to exceed it, effectively putting an end to the need for ongoing user involvement, the learning it generates and the ultimate evolution of the art.

Thanks again for your suggestions and comments. It is a good way to evolve and to expand the art of Universal Designing.

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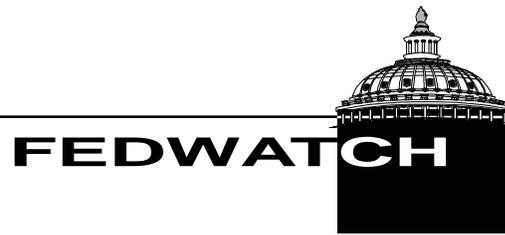
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## Colorado City and DOJ Reach Transportation Agreement

Last month, the Department of Justice (DOJ) and the City of Steamboat Springs, Colo. reached an agreement that resolves a complaint filed by two individuals alleging the city violated the Americans with Disabilities Act (ADA). The agreement marks the first time the DOJ has intervened in an ADA suit challenging the provision of public transportation services.

The suit alleged that by purchasing inaccessible used buses for its public transportation system, failing to properly maintain and repair wheelchair lifts on its buses, and failing to properly train city bus drivers on how to operate their wheelchair lifts, the city violated the ADA.

Among its provisions, the agreement calls for the City of Steamboat Springs to have all vehicles in its active inventory readily accessible to and usable by individuals with disabilities who use wheelchairs. The agreement still requires the approval of the court.

## Access Board Issues Technology Standards

There are now new guidelines for the federal government to follow for ensuring accessibility to electronic and information technology. Published on Dec. 21 by the US Architectural & Transportation Barriers Compliance Board (Access Board), the standards apply to all federal agencies when developing, procuring, maintaining or using such technology. The unique standards, the first of their kind in the federal sector, cover various means of disseminating information, including computers, software, and electronic office equipment. They include a mix of prescriptive requirements and performance criteria.

The Access Board developed the standards under section 508 of the Rehabilitation Act as amended by Congress in 1988. The standards are to become part of the federal government's procurement regulations. However, a federal agency does not have to comply with the technology accessibility standards if it would impose an "undue burden" to do so. An agency claiming such an exemption, must explain why meeting the standards would pose an undue burden for a given procurement action, and must still provide people with disabilities access to the information or data that is affected. ■

**The unique standards, the first of their kind in the federal sector, cover various means of disseminating information....**

### Universal Design & ADA Resource

- See national and international **examples of universal design** in architecture and products.
- See **practical design tips**.
- Read profiles of **industry people and projects**.
- Find new **program and project ideas**.
- Track the evolution of **regulations** related to the ADA.

Now available! A complete set of past issues of *Universal Design Newsletter*. One volume includes an index and 8 issues. Volumes 1-4 are available. For more information, contact *UDN* at 301.270.2470 (v/tty) or 301.270.8199 (fax).

### Visitability Comes to an Illinois City

New single and two-family dwellings in Urbana, Ill. built with city funds must now be "visitable" according to a recently passed city ordinance. The ordinance requires:

- At least one no-step entrance that is served by accessible walks or ramps;
- Landings on a visitable route be no less than 36" by 36" ;
- All doors or openings have a minimum net clear width of 32";
- Each bathroom must have reinforced walls to allow for the future installation of grab bars;
- Wall electrical outlets must be at least 15" above the finished floor; and
- Light switches, thermostats and other control devices must be mounted no higher than 48" above the finished floor.

According to Concrete Change, an organization dedicated to increasing visitability, the scope of the Urbana ordinance is similar to those in Austin, Texas, and Atlanta, Ga. Proponents have been pursuing passage of the measure for two years.

Concrete Change is pushing to make all homes visitable. The basic tenants of the movement are to make all homes visitable and narrow the emphasis from a "list of possible or desirable access features to the most essential features." ■

## Recreation Research Roundup

All accessible trail surfaces are not created equal. A multi-year study by the National Center on Accessibility, a collaborative program of Indiana University and the National Park Service, has found that some surface treatments stand the test of time better than others.

The purpose of the research project was to compare the effectiveness of surface treatments for creating a trail accessible to people with mobility impairments. Specifically, the study examines the longitudinal effects of surface treatments on surface firmness and stability, the costs of applying the treatments, and their relative maintenance demands. The trail base contains compacted soil indigenous to central Indiana.

After two years of use, the test plot with limestone and Mountain Grout Soil Stabilizer has shown the least wear of all the plots. The plot with Road Oyl Resin Modified Emulsion has also shown little wear and has proven to be very useable by people with mobility impairments.

The poorest performing test plots were those with soil alone or a soil and limestone combination. Both have shown substantial decay. When wet, the soil test plot was deemed inaccessible by people with mobility impairments.

**When wet, the soil test plot was deemed inaccessible by people with mobility impairments.**

Test results of the various surface applications can be viewed on the NCA website at [www.indiana.edu/~nca/research/trailresearch.htm](http://www.indiana.edu/~nca/research/trailresearch.htm).

### Outdoor Recreational Activities Popular With All

People with and without disabilities participate in the same outdoor recreation activities, at similar rates, according to a U.S. Forest Service study of outdoor recreation among the U.S. population.

The National Survey on Recreation and the Environment (NSRE) sought information on levels of participation, constraints, and attitudes of people with self-identified disabilities toward outdoor recreational activities. Conducted from January 1994 through April 1995, the survey included information from more than 17,000 Americans over the age of 15. Of the respondents, 1,252 reported having some sort of disability.

The study found that people under the age of 55 who noted a disability tended to have a higher participation rate in recreational activities than their non-disabled peers. However, people over the age of 55 who reported disabilities also reported much lower participation rates than those without disabilities.

See Recreation Round Up, page 15

### Play Areas, *from page 1*

install an accessible surface – the guidelines also address the requirement to maintain such surfaces.

Advocates for people with disabilities welcome the new surfacing requirements. “The language is clearer and more strong in the final guidelines than it was in” the initial drafts, said Cindy Burkhour, a consultant with the Access Recreation Group and a member of Access Board’s play areas regulatory negotiation committee. “An accessible surface has to be maintained in order to remain accessible.”

Burkhour noted that a surface may be accessible when it is first installed, but as children play and the surface gets “kicked up” by typical use, height for transfers are diminished and big holes are worn under swings and at the ends of slides. “If the surface is not maintained, the whole playground will be inaccessible,” she said.

Disability advocates have also applauded its requirement for ground level activities. “If it wasn’t required that there be ground level activities, there would be nothing for some kids to do. Some kids can’t do things without their assistive devices,” said Burkhour.

She says that she would have preferred a lower trigger for the number of elevated components that required the installation of a ramp, but that the guidelines represent a “truly negotiated document.” “Everybody came as a group, everybody made compromises. It is a consensus document that we all support,” said Burkhour.

John McGovern, executive director of the Northern Suburban Special Recreation Association in Chicago, noted that parks and recreation departments across the country spend millions of dollars building play areas and that these guidelines will help in their decision making. McGovern, who was also on the regulatory negotiating committee, said he looks forward to seeing what creative solutions play equipment manufacturers are able to develop.

The guidelines address play areas provided at schools, parks, child care facilities (except those based in the operator’s home) and other facilities subject to the ADA. The requirements will become mandatory only if the Department of Justice incorporates them into its ADA standards. 

**FINLAND: Project INCLUDE, Information Technology Applications**

“Just tell us exactly what we have to do to accommodate the needs of disabled and elderly people, and we will do it,” is the ideal question that the INCLUDE Project hopes that the information technology industry in Europe will ask. The INCLUDE website provides practical knowledge and technical assistance from experts on every phase of the development, production, marketing and evaluation process for information technology and transmission – or telematics, as it is known in Europe. Check out the useful site at [www.stakes.fi/include/](http://www.stakes.fi/include/).

The INCLUDE Project is a huge European-wide effort funded by the European Commission, to improve the development of information technology so that mainstream products better meet the needs of users with disabilities and those who are older. Coordinated and hosted by the National Research and Development Centre for Welfare and Health/STAKES, Finland, the project builds on the rich history in telematics of dozens of European partner organizations. US and other international technology efforts are referenced throughout the website.

The “What’s New” page includes the full *Handbook on Inclusive Design of Telematics Applications* for producers of information technology. Although the handbook can be freely printed, it is most effective on the web, where the Internet links reach expertise worldwide. The comprehensive book addresses everything from marketing challenges to optimizing profitability and to the common resistance to user involvement. Trends in technology, evaluation tools and design-for-all are covered. It includes examples of inclusive design ranging from SmartCards, Smart Houses, to self-service machines and video telephones. General questions concerning the INCLUDE project may be addressed to: Jan Ekberg, Project Coordinator, at: [jan.ekberg@stakes.fi](mailto:jan.ekberg@stakes.fi).

“World Update” is written by Elaine Ostroff, founding director of Adaptive Environments Center. If you have information about international universal design efforts that you would like to see published in *Universal Design Newsletter*, send it to: 6 Grant Ave., Takoma Park, MD 20912; or via e-mail at: [UDandC@erols.com](mailto:UDandC@erols.com).

**GERMANY: Finding Accessible Features in Berlin**

In April 2000 we helped you find your way around Amsterdam. Now you can learn about the accessible features in Berlin – which is not the most accessible city. If you are planning a trip to Berlin, or if you are considering a web-based inventory on accessible features for your city, check out the Movado website at [www.movado.de/indexe.html](http://www.movado.de/indexe.html).

It has a searchable database (in both English and German) that allows you to look at the details of over 50,000 facilities that have been surveyed. The pull down menu system displays the types of places such as retail, recreation, health facilities and hotels. For example, after clicking on health facilities, you will find a list of varied settings such as acupuncturists, dentists, and neurologists. You can then get detailed information for the width of the doors, height of the thresholds, etc.

Clicking on the address will also bring up a map. Although the emphasis in the web database is on information for people who use wheelchairs, Movado also addresses issues of vision and hearing. Its goal is to improve life for all people and it is trying to convince the city to “design-for-all.” Movado is a private association partly supported by the German government, the Berlin County Council’s Employment Office, and the European Union.

**ITALY: Usability of Italian Towns**

Towns in northern Italy are more accessible than those in the south, according to a national survey conducted by Altroconsumo, an Italian consumers association, in partnership with associations of people with disabilities. The survey examined the built environment for accessibility and usability in 17 towns all over Italy to learn what has been done and what could be improved. Eight of the 17 towns received a good evaluation.



The Wittenbergplatz Underground Station in Berlin has lifts that open onto the platform.

Photo: B. Agergaard/Crisp & Clear



[The Movado website] has a searchable database (in both English and German) that allows you to look at the details of over 50,000 facilities that they have surveyed.



The pathways in this and other Italian towns were surveyed to assess usability.

Photo: Luigi Biocca

# Brookfield Zoo: An Adventure in Universal Design

## *A Winner from the Search for Universal Design Exemplars*

Chicago's 216-acre Brookfield Zoo has carefully designed features within its overall design to accommodate the needs and wants of its 2.2 million annual visitors.

Built on flat terrain, the zoo has 10 miles of paved walkways that provide access for all visitors. It includes 17 outdoor exhibit areas, a naturally wooded area and a nature trail surrounding a four-acre lake with waterfowl. Its 15 buildings provide nine acres of indoor exhibit space.

Visitor amenities include accessible trams with assistive listening systems, Braille and large print maps, signage with large, high-contrast type, mounted in locations which are easy to read at close range and pictures and/or graphics supporting messages and information provided in type.

### **Equitable Use**

Windows into large exhibits provide viewing opportunities for children and adults, as well as wheelchair users. Large diverse groups can view exhibits simultaneously.

### **Simple and Intuitive Use**

Visitor maps are presented in large print include color coding and graphic symbols for key elements. This is helpful for people who are visual learners, people who are non-English speakers, who have low

vision, who have limited color acuity, who have cognitive disabilities, or who have forgotten their reading glasses.

### **Perceptible Information**

Many of the exhibit displays include tactile signage or alternate formats (such as Braille) and touchable replicas for users who have vision disabilities. Others provide audio output and the tram is equipped with assistive listening devices.

### **Low Physical Effort**

Electronic convenience vehicles and the tram enable people with limited mobility or stamina or with temporary injuries to enjoy all parts of the zoo.

### **Size and Space for Approach and Use**

Life-sized sculptures are placed in open areas and at convenient heights for approach by all visitors including wheelchair or scooter users, people of short stature, and children in strollers. Sculptures are placed so that they do not constitute protruding objects. 

*Editor's Note: This article is the latest in a series showing projects from National Endowment for the Arts-funded design competitions. For more information on this project, contact the Center for Universal Design at [www.design.ncsu.edu/cud](http://www.design.ncsu.edu/cud); 800.647.6777 (voice); or 919.515.8548 (voice/tty).*

**Visitor maps presented in large print also include color coding and use of graphic symbols for key elements.**

## Search Continues for Director of Center for Universal Design

The Center for Universal Design, College of Design, North Carolina State University is continuing its search for an executive director.

The director's primary responsibilities are to provide energetic leadership in strategic planning, resource development and project implementation. The director has overall responsibility for staff recruitment and coordination, fiscal management and contractual accountability to multiple public and private funding sources. In addition, the director is responsible for developing and maintaining relationships with professional design constituencies, disability communities, business communities, and government agencies while also serving as the Center's senior spokesperson to diverse national and international audiences. The successful candidate will have the opportunity to teach and conduct research with the College of Design. The position involves a moderate amount of travel.

Qualifications: The candidate preferably will hold a professional design degree or advanced research

degree and will have a minimum of five years of experience in administration of research, design, training, or service programs in areas related to accessible and universal design or assistive technology. Other strong combinations of education and experience in a field related to universal design will also be considered as a qualification for candidacy. The candidate must have a successful track record in grant writing, resource development and fundraising, and knowledge of private and public funding sources. The position demands excellent written, verbal communication and interpersonal skills, and the ability both to lead and work effectively within groups. The candidate should also have the ability to conceptualize and communicate the relationship of universal design with issues of disability rights and independent living.

Position Status: Full-time appointment includes university fringe benefits. The position is funded by the College of Design and grants from the National Institute on Disability and Rehabilitation Research at the US Department of Education. The director

See Executive Director Search, page 14

# Universal Design and the Palm Beach Ballot

Amidst the confusion surrounding the Gore-Bush presidential election, one thing was clear: The Palm Beach, Fla. “butterfly” ballot -- poorly designed and difficult to understand -- serves as one source of a contentious problem -- and also underscores the value of universal design in everyday life.

Universal design is a concept that, in theory, makes life easier for everyone, not just people with disabilities.

Simply put, universal design, it is the design of environments, products and systems that are easier for everyone to use and that do not discriminate against any group.

The following Seven Principles of Universal Design were developed by a group of experts: Equitable Use, Flexible Use, Simple and Intuitive Use, Perceptible Information, Tolerance for Error, Low Force of Effort, and Size and Space for Approach and Use.

The ballot design used in Palm Beach, clearly, didn't follow all of these universal design principles. The design did have large type to help older voters. However, it also had significant characteristics that violate two of the tenets of universal design, Simple and Intuitive Use and Tolerance for Error.

To be most usable to the widest variety of individuals, the design of a ballot should:

- 1) not require a lot of conscious thinking, instructions or experience to use properly; and
- 2) help alert users to a mistake and allow them to correct it without disastrous consequences.

Why isn't the Palm Beach ballot simple and intuitive to use? There are three reasons, well under-

stood by researchers in the field of human factors, that help shed some light on this question.

First, the layout of the ballot was unusual, because it did not follow the format commonly used to associate two rows of related information. Typically, rows of information would be organized into two columns, one for the candidate's name and one with a check-off box for that candidate -- a practice, in fact, reflected by Florida state election law. However, in this case, the designers of the form chose one

punch out column for two rows of candidates. This is a very different conceptual model that, to be effective, requires a graphic design which focuses attention on the unusual arrangement. This was attempted with arrows, but apparently not adequately.

Second, there is a design concept for relating actions to consequences called “natural mappings.” A common example is the mapping of controls to burners on a stove. We have all encountered a stove where the layout of the controls is different than that of the burners. A natural mapping where the controls and burners are placed in the same pattern is much easier to use because figuring out which control to use for which burner is intuitive.

In the Palm Beach ballot, the mapping of names to holes was not a natural mapping. The first name on the list (Bush) was matched to the first hole, but the second name (Gore) was matched to the third hole. Because Bush was at the top, it was easy to determine which hole should be used for him, while for Gore and Buchanan, it was much more difficult.

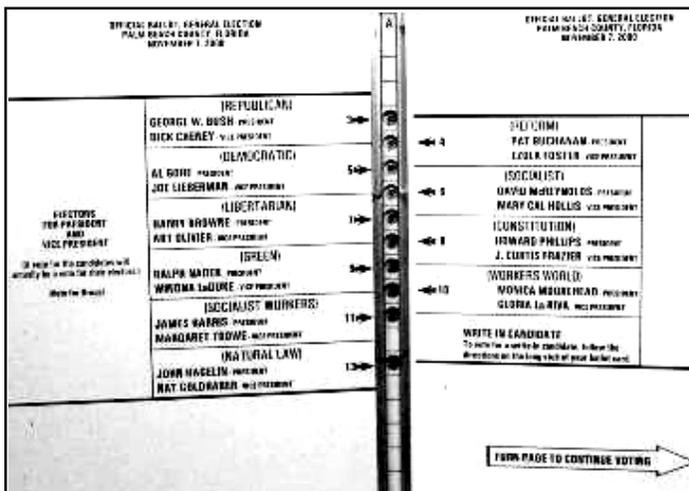
In fact, it is not far fetched to interpret the Gore line as having two or three optional holes. This interpretation is reinforced by the fact that the lines separating each of the parties bracketed more than one hole.

Third, the lines at the top of the ballot on each side were offset. This was probably an attempt to reinforce the fact that the candidates on the left corresponded to alternating holes. However, voters generally expect borders like these to line up. If they don't, how are they to be interpreted? Although there are arrows to indicate which hole to punch, the lack of a natural mapping and the offset lines are confusing. It is easy to assume that the holes were mistakenly offset.

Commentary  
Ed Steinfeld,  
Aaron Steinfeld and Lisa A. Goldstein



*In the Palm Beach ballot, the mapping of names to holes was not a natural mapping.... In fact, it is not far fetched to interpret the Gore line as having two or three optional holes.*



## News from the Center

November marked the first anniversary of operation for the RERC on Universal Design at Buffalo. By fall, construction of our new facility on the third floor of Hayes Hall was nearly complete.

Two renovated bathrooms – one ADA compliant, the other an “experimental” bathroom with cutting edge technology and universal design elements – and



The women's restroom in the new RERC on UD facilities includes many universal design features.

the creation of a secure separate wing for the center were the first elements complete. The final phase of construction will renovate the RERC's Design Lab and display space so that the finished center will not only more easily house research, outreach and training programs, but also function as a show-

case for applied examples of universal design.

### Spreading the Word

During its first year, RERC made more than 20 conference presentations, reaching more than 3,000 professionals, consumers and designers. It organized a Visitability education training and coordination conference in Atlanta this summer. Representatives from 10 cities discussed strategies for promoting the inclusion of Visitability standards in private and pub-



RERC organized a visitability conference in Atlanta last summer.

licly funded housing projects and toured examples of Visitable units. The conference spawned a PowerPoint presentation on the concept (which will be made available to the public through conferences and the worldwide web) and a consumer-oriented strategies booklet.

In addition, the RERC presented the Visitability Advocacy strategies as a workshop at the “Doors 2 Inclusion” conference, in December at Baton Rouge, La. The conference was sponsored by the Louisiana Assistive Technology Access Network (LATAN).

RERC Project Directors Professor Abir Mullick and Beth Tauke were also featured at the recent Congress on Environmental Design for the New Millennium, which took place in Korea in November and attracted nearly 2,000 attendees. Between them, Mullick and Tauke co-authored and delivered six research papers and moderated the workshop Universal Design Begins with U(sers).

In addition, Mullick, a consultant to the United Nations on universal design, delivered a keynote address at the conference entitled, The Universal Bathroom: Design for Everyone.

### UBD on the Go

The RERC continues to promote its traveling Unlimited by Design (UBD) exhibit. Pre-production work on a videotape promoting the Unlimited by Design exhibit is underway, and the RERC has already received several requests to host its travelling version of the UBD. Currently available materials on the exhibit include a PowerPoint presentation and a schedule of projected costs associated with hosting the exhibit.

### Year End Review

Ed Steinfeld, Steve Truesdale and Victor Paquet travelled to Washington, DC for the RERC's formative (Year 1) Review by the National Institute of Disability and Rehabilitation Research (NIDRR). The comments and suggestions of the reviewing panel will be incorporated into the program to make it even more effective. One immediate change will be an enhancement of communications between RERC and its project advisors.

For more information on any topic in this article, please contact RERC Assistant Director Steven Truesdale at 716.829.3485 x 335 or AJ Imiolo at 716.829.3485 x 329. Visit our websites:

[www.ap.buffalo.edu/~rercud](http://www.ap.buffalo.edu/~rercud)

[www.ap.buffalo.edu/~idea](http://www.ap.buffalo.edu/~idea)



## Measuring the Universal Usability of Buildings

In November, the Rehabilitation Engineering Research Center (RERC) on Universal Design at Buffalo began a multi-year research project to prove that universally designed buildings are more usable than those that are “accessible.”

“Part of the challenge of advocating Universal Design as a standard for professionals is to differentiate Universal Design from one more set of measurements and/or regulations,” says Ed Steinfeld, director of the RERC on Universal Design at Buffalo. “UD does not represent a specified set of outcomes, but rather a fundamental change in the way the design process is viewed.”

According to Steinfeld, this differentiation is easy to describe conceptually: An accessibly designed product service or system provides additional and/or more inclusive service for those with disabilities, but does not change the experience of the non-disabled user of that product service or system. However, because the universally designed product, element or environment presumably provides additional benefits and advantages “equally” to all members of a community providing “concrete” proof of this difference has always been problematic.

During the project, entitled “Buildings in Use,” participants’ experiences with similar features in two buildings – one universally designed and the other merely ADA compliant (accessible) – will be compared. The primary objective of this project will be to demonstrate the ability of universal design to produce buildings which are quantifiably more usable by all people than comparable buildings created without universal design in mind.

Through four comparative studies of pairs of buildings currently in use, the project will test three commonly accepted hypotheses about the benefits of universal design:

1. Non-universally designed buildings are less usable for people with impairments than they are for people without impairments;
2. The usability of universally designed buildings for people with impairments is not significantly different than their usability for people without impairments; and
3. Universally designed buildings are more usable for people both with and without impairments than equivalent non-universally designed buildings.

Three groups of adult participants with single impairments (i.e., mobility impaired, hearing impaired and vision impaired) and a fourth group of adult participants without impairments will be recruited to experience each pair of buildings.

Each participant will be individually guided into

and through both buildings by a member of the research team. Immediately after a participant encounters one of the 10 design features under study, the tour guide will pause the tour and ask the participant a series of standardized questions about the usability and acceptability of the design feature just experienced.

These design features will be compared:

- path(s) of travel for entrance and egress;
- the lobby;
- general illumination;
- orientation and way-finding systems (e.g., signage);
- horizontal mobility systems (e.g., circulation corridors);
- vertical mobility systems (e.g., stairs and elevators);
- public restrooms (including the door, toilet and lavatory);
- public amenities (public telephone, water fountain etc.);and
- matched program areas in each building.

Participants will be video taped and their reactions studied. Researchers will examine the perceived usability and acceptability of each design feature and the evaluations of the participants’ actual physical encounters with those same features.

This project will study one pair of buildings during each of the next four years, beginning with the headquarters of Lighthouse International in New York City – which was one of the first buildings to be designed using universal design principles.

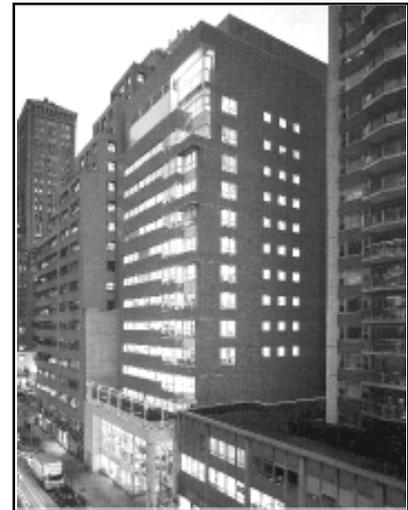
The research is expected to result in criteria to evaluate universally designed buildings. Eventually, usability and acceptability norms could be established.

Such norms should also be useful during the eventual development of formal standards for universal design.

The results of the research project are expected to demonstrate significant benefits of universally designed buildings relative to equivalent ADA compliant (yet non-universally designed) buildings for people of all abilities.

Professor Gary Scott Danford, of UB’s School of Architecture, is director of the Buildings in Use Project. For more information, please contact RERC Assistant Director Steven Truesdale at 716.829.3485 x 335 or AJ Imiolo at 716.829.3485 x 329 

**The research is expected to result in criteria to evaluate universally designed buildings.**



### **Palm Beach Ballot**, *from page 7*

Viewing the ballot from an angle, unlike the straight-on view shown in the press, would lead to additional difficulty in lining up the arrows with the guide holes. Older voters may be hesitant to lean over the ballot for a better viewing angle for fear of losing their balance.

Regarding "tolerance for error," a second principle of universal design that was all but ignored – the obvious question is why didn't the ballot allow a voter to correct an error? Once voters punched out the hole, they had no recourse. Even if they did discover their errors, they could do nothing to fix them, short of asking for a new ballot. Whether or not they had the knowledge or opportunity to do so is unknown. It may be likely that those who did make an error and discovered it, punched out a second hole, but this effectively disqualified their vote. In fact, this could be what happened to a large portion of the estimated 19,000 double-punched ballots. Of course, voters must be aware that they made an error before taking any action at all. The guide holes mask the ballot in a way that prevents easy detection of errors. The punch card method also lacks feedback to the voters for help spotting mistakes. Pen and lever based voting methods provide clearer visual identification of the choices made. With a computer based process one could even summarize the result of a voting session and have the voter confirm it before registering the ballot.

In the total scope of things, this poor design for correction and feedback is the worst aspect of the ballot's design. These flaws were then exacerbated by the fact that a time limit of five minutes was imposed on Palm Beach voters. Although voters may have been told that they could ask for help, it is unlikely that many would admit that they had a problem during the course of voting. Such an admission in front of a room full of people would be embarrassing, not to mention the fact that it could result in a violation of the privacy expected in the voting booth. Moreover, there's no guarantee that volunteers available for assistance at polling places would provide assistance with such problems. The odds are

they would be too busy to help every confused voter.

Two voters quoted by ABC.com illustrate the design problems described above. One of them said "By Gore there were two holes ... I had to figure out which one. I asked one of the ladies for help and she didn't know. When I left I figured out I voted wrong." Another voter complained, "I don't know if I voted wrong ... Republicans had only one hole, Gore-Lieberman had two. I think I did right, but it was very confusing."

It is no wonder that the poor ballot design caused such a problem in Florida. The US Census reported that in 1998, 18.3 percent of the population in Florida was 65 or over compared to 12.7 percent in the total US population. Older people have a more difficult time adjusting to new conceptual models as well as making decisions in short time frames. Because of conditions associated with the aging process, they are more likely to have limitations of vision and cognitive deficits that affect overall performance enough to make them more sensitive to poor design.

The angry reaction of many senior citizens to the ballot design is an interesting development. For many years, people have been advocating universal design and predicting that the aging "Boomer" generation will eventually bring with it a greater demand for it. Too often, older people blame themselves for difficulties they experience using the environment and everyday products. However, this should not be the case. If designed correctly, products and the environment can be used by almost everyone without assistance from others. These angry senior citizens are only voicing their demand for design that does not discriminate.

The ballot snafu is particularly useful as a lesson on the influence of design on our lives. A ballot's poor design could actually determine who becomes president of the country. Even something apparently as simple as a ballot's layout cannot be taken lightly.

Although younger people also had problems using this ballot, the older population, in all probability, encountered them far more frequently. As the baby boom generation ages, we can expect many more examples of bad design to gain the public's attention. Many of such examples are already well known to the experts: seat belts, voicemail menus, income tax forms, toilets, and VCRs. An aging society requires environments, products and systems that are more usable and friendly for all.

Perhaps the lesson of the ballot will raise the consciousness of politicians to the point that universal design becomes a political issue. Which party will pick up the torch first? 

**As the baby boomer generation ages, we can expect many more examples of universally bad design to reach the public's attention.**

*The contents of this insert are provided by the Rehabilitation Engineering Research Center (RERC) on Universal Design at Buffalo, which is sponsored by a grant from the National Institute of Disability and Rehabilitation Research (NIDRR) U.S. Department of Education (DOE). The contents do not necessarily represent the policy of DOE. Readers should not assume an endorsement by the federal government.*



## Website Spotlight: RESNA offers help for designers, engineers & builders

Designers, engineers and builders looking for technology and disability resources will find answers on the Rehabilitation Engineering and Assistive Technology Society of America (RESNA) website. RESNA is an interdisciplinary association of people with a common interest in technology and disability. A visit to [www.resna.org/taproject/policy/community/HMRG.htm](http://www.resna.org/taproject/policy/community/HMRG.htm) provides information on assistive technology and home modifications, including laws and guidelines; initiatives from the Assistive Technology Act grantees; advocacy, financing, modification and research resources; accreditation; online courses; and a bibliography. The uncluttered, no-frills design of this site makes it easy to access specific information quickly or scroll through the entire page for definitions and a comprehensive listing of books, articles, guidelines, accessible home plans, newsletters, reports, videos and slide shows.

The website also contains information on the society as well as a job bank, government affairs and educational technology sections and links.

## Directory of Accessible Building Products 2000

This comprehensive, 94-page directory, published by the National Association of Home Builders (NAHB) Research Center, contains accessible building products for kitchens, laundry rooms, bathrooms and stairways, including cabinets, doors, windows,



assistive hardware, climate control instruments, gas shut-off valves, plumbing systems, ramps and more. Each section features detailed product information – from dimensions and construction materials to warranties, certifications, special options and manufacturers' addresses.

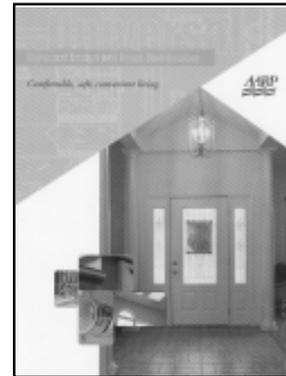
The *Directory's* appendix lists additional publications on building guides, waste management, housing, accessibility, quality management, standards and services. To order, contact the NAHB Research Center at 800.638.8556 or visit [www.nahbrc.org](http://www.nahbrc.org).

## AARP's *Universal Design and Home Modification*

The American Association of Retired People (AARP) has published a booklet highlighting the features of a universally designed home. The home was built with the support of AARP and other organizations to raise awareness among consumers, designers, architects, remodelers and builders. The 32-page, full-color booklet includes details about the home and its features, as well as information on modifying existing homes to enhance resident independence, control and convenience.

In addition to providing the floor plan, elevation renderings, product listings (with 1998 prices) and

resources for the universally designed home, the booklet uses color photographs to highlight exterior, entryway and interior accessibility features. The Modifications Section explains the importance of accessibility, offers a few simple tips to enhance safety and comfort and provides guidance on selecting a contractor and financing remodeling. To order, visit [www.aarp.org](http://www.aarp.org).



## "The ABCs of Accessibility" Video Series

This five-part video training course, produced by accessible design consulting firm ADAPtations Inc., provides education and product recommendations for designers and builders in the field of accessible design. Each video offers a comprehensive look at key areas, from basic design issues and client assessment to accessible bathrooms, kitchens and other living spaces. Using real-life situations, the videos provide practical, proven solutions for creating accessible living environments for people with disabilities and the aging population.

The first video in the series, *Crossing the Line: Designing for People with Disabilities*, is available now. *Up Close and Personal: Client Assessment* and *When You Gotta Go, You Gotta Go!: Designing Accessible Bathrooms* are scheduled for release in spring 2001. *Cookin' with Access: Designing Accessible Kitchens* and *Room to Roam: Accessible Design for All Living Spaces* are due out in fall 2001. To order *Crossing the Line* (\$95 + shipping and handling) or for more information, call 877.746.2227. 

*The 32-page, full-color booklet includes details about the home and its features, as well as information on modifying existing homes to enhance resident independence, control and convenience.*

## Universal Design Exemplars Announced

**M**ore than 30 projects were selected as examples of excellence in universal design by the Center for Universal Design's Universal Design Exemplars search, with the support of the National Endowment for the Arts and The NEC Foundation of America.

The 32 winners were selected from design disciplines including architecture, landscape architecture, industrial design, interior design and exhibit design.

A panel of nine jurors reviewed the entries and helped recommend the final projects. Those selected have been combined in a CD-ROM available from the Center for Universal Design.

The winners are:

- Alex Wilson Community Garden, Kent Ford Design Group, Toronto, Ontario
- Allegro Cookware, Metaphase Design Group, St. Louis, Mo.
- Amphitheater at Bradford Woods, National Center on Accessibility, Martinsville, Ind.
- Apollon Lamp, Tokyo Design Network, Tokyo, Japan

- The Art House, Action Wood Technologies, Clinton Township, Mich.
- Barrierfree Kitchen, KIDStudio Corporation, Yokohama, Japan
- Brookfield Zoo, Brookfield Zoo, Brookfield, Ill.
- Chuo Silver Zone, Nikken Sekkei Ltd., Bunkyo-ku, Tokyo, Japan
- Cridge Centre, Donna Riddell Design, Victoria, B.C.
- The Dorcas Project, The Dog Rose Trust, Ludlow Shropshire, UK
- Freewheeling, Mountain Cabin, Asheville, N.C.
- GE Living Center, Mary Jo Peterson Inc., Brookfield, Conn.
- Graniteville Playground, Playground Environments, Quogue, N.Y.
- Handy Birdy Pen, Environmental Design Studio, Tokyo, Japan
- Health Buddy, IDEO, Palo Alto, Calif.
- IT-G1000 Telephone, Sony Corp., Tokyo, Japan
- LifeSpan Seating, LifeSpan Furnishings LLC, Emeryville, Calif.
- Ludus Lever Handle, Colombo Design SPA, Terno, D'Isola (BG), Italy
- MAE Ticket Machine, CRID, Barcelona, Spain
- Microlet Finger Device, Metaphase Design Group, St. Louis, Mo.
- Millay Colony for the Arts, Michael Singer Inc., Wilmington, Vt.
- Museo Columbia and Musee Des Beaux Arts, Coco Raynes Associates Inc., Boston, Mass.
- National Building Museum, Washington, D.C.
- Portal Shield, Carlson Technology Inc., Livonia, Mich.
- Rinku Park, SEN Inc., Osaka, Japan
- Sensory Garden, SEN Inc., Osaka, Japan
- Shougai Juutaku, Sekisui House Ltd., Kyoto, Japan
- Stadium Seating, Volunteers for Medical Engineering Inc., Baltimore, Md.
- System for Handrails, HEWI Inc., Lancaster, Pa.
- TransG(tm) Interior, Lear Corporation, Southfield, Mich.
- Video Entry System, Aiphone Co. Ltd., Nagoya, Japan
- Window Ease, A-Solution, Albuquerque, N.M.

**The 32 winners were selected from design disciplines including architecture, landscape architecture, industrial design, interior design and exhibit design.**

### World Update, *from page 5*

ation for overall usability.

The towns selected for the surveys had populations ranging from 50,000 to 3 million and represented the lead towns within each of 17 regions. The survey looked at four aspects of each town: Accessibility of public buildings and facilities; Information about town services; Mobility effectiveness of the transportation system; and Usability of basic services and recreation facilities.

The accessibility evaluation tool was a detailed questionnaire completed by a person using a wheelchair who was experienced in barrier-related problems. The qualitative review of information addressed all materials, including maps, general guidance and websites, provided by the municipalities. The transportation evaluation included basic movement throughout the town.

The combined tabulations of all areas resulted in a measurement of usability for each town. Although now there is great divergence in providing access to facilities and services, there is a growing effort to develop policies for renovation and for providing services to enable all citizens to fully use their urban environment.

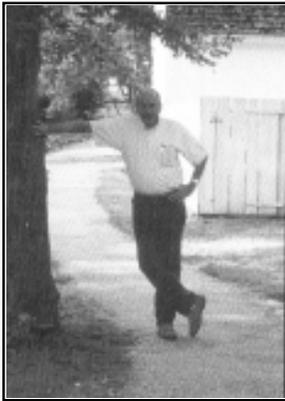
For more information, contact Luigi Biocca, CNR CITE at [md3285@mclink.it](mailto:md3285@mclink.it).

For more information on the competition, contact the Center for Universal Design at [www.design.ncsu.edu/cud](http://www.design.ncsu.edu/cud); 800.647.6777 (voice); or 919.515.8548 (voice/tty).

**PRODUCTS**

**Pathway Binder for ADA Compliance**

Used for natural pathway restoration in historic Williamsburg, Va., Klingstone 400 is a high-viscosity, high-strength liquid polyurethane binder designed

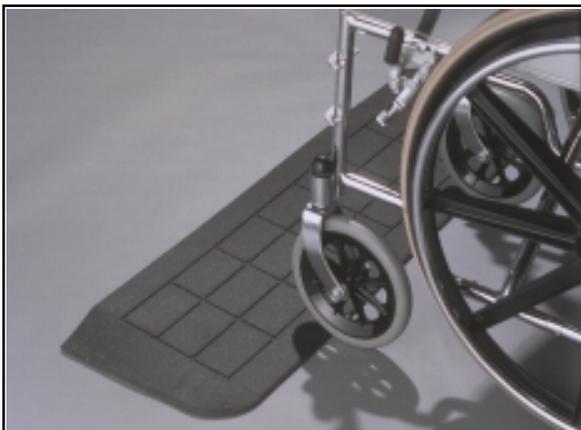


to prevent erosion, stabilize pathways and cart paths -- making them useable by people with disabilities. The product is environmentally safe, non-hazardous to transport, permanent and easy to apply on stone, sand and other fine soils where an aggregate of up to 3/4 inch is desired. Simply pump or pour onto the area to be treated and let

cure for 24 to 48 hours. In addition, Klingstone distributor Green Mountain International provides toll-free and on-site technical assistance.

**Modular Ramp System**

Made entirely of recycled rubber, the EZ Edge<sup>a</sup> Modular Ramp system provides a smooth transition from floor or walkway levels to existing thresholds or elevations. The anti-slip surface, rounded 1/4-inch leading edge and 22-degree side slopes provide a safe and gentle approach, while the molded traction pads provide additional anti-slip protection and visual appeal. The ramps, which can be cut, trimmed and notched to fit any threshold configuration, install easily with silicone adhesive to concrete, tile, marble, glass, wood (including painted surfaces) and natural and synthetic fibers. Manufactured by Van Duerr Industries, EZ Edge was created to meet or exceed several ASTM tests and the ADA.



**Accessible Shower Accessories**

Best Bath Systems, a division of Fiberglass Systems, Inc., offers a variety of accessible shower accessories that fit its own Access ADA and Barrier Free shower units as well as other brands. The removable lightweight

ramp, constructed of fiberglass with a gelcoat finish to match the shower, features a durable, non-skid textured surface and will fit both 48- and 60-inch



openings. The semi-permanent threshold adaptor, made of white powder-coated aluminum, is available in three models to fit openings up to 60 inches wide, and the collapsible water retainer, molded from heavy-duty rubber, installs easily with glue and silicone to most accessible shower unit.

**Wheelchair-Accessible Picnic Table**

The extended ends and raised top-measuring a full four inches higher than standard picnic tables-makes BARCO Products' Model FP1030 picnic table accessible to two wheelchairs. Constructed of 100 percent recycled plastic, the sturdy, maintenance-free one-



piece unit measures 29 inches wide, 96 inches long and 33 inches high with two 10-inch wide, 72-inch long and 21-

inch high benches. The table is available in three color combinations: green base with cedar table and benches; brown base with cedar table and benches; and gray. ■

**Green Mountain International, Inc.**  
(Klingstone 400)  
235 Pigeon Street  
Waynesville, NC 28786  
Phone: 800.942.5151  
[www.mountaingrout.com](http://www.mountaingrout.com)

**Van Duerr Industries**  
(EZ Edge<sup>a</sup> Modular Ramp System)  
820 W. 7th Street  
Chico, CA 95928  
Phone: 800.497.2003  
[www.dstraut.com/vanduer](http://www.dstraut.com/vanduer)

**Best Bath Systems**  
(Accessible Shower Accessories)  
4545 Enterprise  
Boise, ID 83705  
Phone: 800.727.9907  
[www.best-bath.com](http://www.best-bath.com)

**BARCO Products Company**  
(Wheelchair-Accessible Picnic Table)  
11 N. Batavia Avenue  
Batavia, IL 60510  
Phone: 800.338.2697  
[www.barcoproducts.com](http://www.barcoproducts.com)



Visit *Universal Design*  
Online at  
[www.UniversalDesign.com](http://www.UniversalDesign.com)

## Stadium-style, *from page 1*

Faltings and the New York City-based architectural firm of Shuman, Lichtenstein, Clamen, Efron to advance the design of stadium-style theaters. "For every new facility or renovation, there's a design prototype that we follow," says Norris, "but we also watch what works and what doesn't as we build, and we improve upon that design with each subsequent project." Consequently, this renovation meets the spirit of the ADA requirements to make movie-going more comfortable for people with disabilities.

Montgomery County Commission member and past chair of the Commission's ADA subcommittee, Cindy Buddington, is no stranger to many of the flaws found in the design of movie theaters. Awkward seating, small restrooms, inaccessible concession stands and staff-operated mechanical lifts have challenged and restricted the mobility of Buddington using her wheelchair. Some of the newly designed stadium-style cinemas, although ADA compliant, give people with disabilities accessible viewing positions that are right down in front, just a few feet from the screen.

"What really impressed me about the Loews Cineplex Rio renovation is that they made the wheelchair seating more comfortable by moving it back several rows," says Buddington. "Although I'd prefer to have more freedom in seating location, at least I'm not straining my neck or moving my head back and forth to watch the action on the screen."

In addition to relocating the wheelchair seating several rows back – roughly 10 feet further back than in previous theater designs – Loews Cineplex Rio added wider than normal wheelchair positions and innovative companion seating with movable armrests to accommodate smooth transferral and larger patrons, as well as people who want to hold hands in the theater without the intervening arm rest.

Buddington was also pleased to see other improvements made to the newly renovated facility, including upgraded restrooms with a wider stall and accessible sinks, hand dryers and faucets; concession stands that feature lowered counter space for convenient wheelchair access; and a gently sloping ramp to replace a staff-operated mechanical lift, allowing patrons of all abilities to move more easily into the theaters.

"One of the most remarkable things about this theater is the staff's willingness to continue to evaluate and improve the facility as the state of accessibility is further defined and advanced by new technology," says Buddington. "Even though they currently meet ADA compliance in the restrooms, they have agreed to take out a four-foot-wide toilet stall and install a five-foot-wide stall with an acces-

sible baby changing area, losing one stall."

The Kermit Mohn Barrier-Free Design Award, presented annually to a public or private facility that has adapted its facility to meet the access needs of people with disabilities in accordance with the Americans with Disabilities Act, is one of several



The concession stand design works for all.

annual Pyramid Awards sponsored by the Montgomery County Executive, Department of Health and Human Services, Office of Human Resources and Commission on People with Disabilities.

In presenting the award to Loews Cineplex Rio Cinemas last October, the commission noted that [the Rio Cinemas theaters] want to provide choice and comfort for their patrons," adds Buddington. "This theater has the nicest stadium seating and access of any theater in the area." □

**"One of the most remarkable things about this theater is the staff's willingness to continue to evaluate and improve the facility as the state of accessibility is further defined and advanced by new technology."**

Cindy Buddington,  
Former Chair ADA  
Subcommittee,  
Montgomery County  
Commission on on  
People with Disabilities

## Executive Director Search, *from page 6*

reports to the Dean of the College of Design. The position includes appointment to research faculty status in the most relevant department in the School of Design.

Applications should be submitted as soon as possible. The position became available Jan. 1, 2001 and will remain open until filled.

Send letter of interest, curriculum vitae, samples of writing and names of three persons who can be contacted to provide recommendations. Forward all materials to:

Search Committee  
Center for Universal Design  
College of Design  
Box 8613,  
NC State University  
Raleigh, NC 27695-8613







Printed on recycled paper with vegetable inks.

**Jan. 8-10, 2001:** *The US Architectural & Transportation Barriers Compliance Board* will hold its bi-monthly meeting in Washington, D.C. For more information, contact the Access Board at 202.272.5434 (v), 202.272.5449 (tty).

**Jan. 16, 2001:** *Home Sweet Home* will be offered as part of the DBTACs ADA Distance Learning Series. The one-hour program, presented by Kathy Gips of Adaptive Environments and Gladys Sumbry of the US Dept. of Housing and Urban Development, will discuss accessible housing issues. For more information, see [www.adagreatlakes.org](http://www.adagreatlakes.org).

**Feb. 8, 2001:** *2nd Annual Caring Communities for the 21st Century: Imagining the Possible*, United Nations Headquarters, New York. Organized by the International Council for Caring Communities, the conference is designed to build bridges and develop projects, services and products that support the needs of people of all ages. For more information, contact ICCC via fax 212.759.5893 or e-mail [iccc@undp.org](mailto:iccc@undp.org).

**Feb. 20, 2001:** *What's Wrong with this Picture?* will be offered as part of the DBTACs ADA Distance Learning Series. The 90-minute program, presented by Mark Derry of Eastlake Derry & Associates, this web-based presentation will be on the application of the ADAAG and include practical solutions to maximize access. For more information, see [www.adagreatlakes.org](http://www.adagreatlakes.org).

**Feb. 22, 2001:** *Missouri Park and Recreation Association Conference*, St. Louis. The conference will include a presentation from Access Board staff. For more information, contact Peggy Greenwell at 202.272.5434, x134 (v), 202.272.5449 (tty).

**March 12-14, 2001:** *The US Architectural & Transportation Barriers Compliance Board* will hold its bi-monthly meeting in Washington, D.C. For more information, contact the Access Board at 202.272.5434 (v), 202.272.5449 (tty).

**April 17, 2001:** *To Complain or Not to Complain? Mediate? or File Suit?: Unraveling ADA Resolution Options* will be offered as part of the DBTACs ADA Distance Learning Series. The one-hour program, presented by Peter Maida of the Keybridge Foundation and Barry Taylor of Equip for Equality, will discuss the ADA complaint process. For more information, see [www.adagreatlakes.org](http://www.adagreatlakes.org).

**June 1-5, 2001:** *Inclusion by Design: Planning the Barrier-Free World*, Montreal, Quebec, Canada. The event is hosted by the Canadian Council on Rehabilitation and Work. Participants will look at inclusive policies which can be developed and implemented through government, corporate and community infrastructures. For more information, see [www.ccrw.org](http://www.ccrw.org).

Events to be placed in the UDN Calendar must be submitted to the editor two months before the publication date.

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20912

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