



Working toward
universal access
through research,
design & education

December 2003

Dear Friends & Supporters

Another year makes its retreat, and those of us at Beneficial Designs would like to look back on what a year 2003 has been.

Once again, the Beneficial Designs team, compiled of three offices and several consultants, has had a very exciting year. We are nearing completion on some cutting edge projects while continuing to develop ideas for new ones.

In addition to many locations throughout the United States, 2003 proved to be an eventful year, taking us as far as Switzerland and New Zealand.

We would like to share with you a few of the projects we have been working on this past year. Thank you for your continued support and interest in our work. All of us here at BD would like to wish you a joyful holiday season.

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Funding agencies and other acronyms:

DOT Department of Transportation
FHWA Federal Highway Administration
ISO International Organization for
Standardization

NICHHD National Institute of Child Health and
Human Development

NIH National Institutes of Health

RESNA Rehabilitation Engineering and
Assistive Technology Society of
North America

SBIR Small Business Innovation
Research

USDA United States Department of
Agriculture

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UTAP Coordinator Workshops

Kathy, Peter and consultant Patti

This year 96 individuals were trained to lead assessments, using the Universal Trail Assessment Process. The UTAP Coordinator Workshops were held in Arizona, Nevada, California, Pennsylvania, and Virginia. Workshop participants included trail professionals, college students, and volunteers. Several UTAP Workshops are being planned for 2004 to be held in Nevada, California, Pennsylvania, and Texas. Contact <trails@beneficialdesigns.com> for workshop dates and locations.



TrailWare: UTAP Software

NIH/NICHD SBIR Phase II Grant #2 R44 HD36538-02
Kathy, Seanna, Peter and consultants Patti, Joan, John, Jay & Dan

TrailWare, the data processing software for the UTAP, is in its final stages of development. Several agencies and organizations have been participating in beta-software evaluations to assist in creating an effective data analysis tool. Future plans include adding modules that will identify compliance with design guidelines, reports for trail managers and users, and the use of a hand held data collection device. TrailWare Training Courses are also available and will be held in California, Nevada, and Texas during 2004.

Trail Explorer Website

DEd SBIR Phase II Grant #ED-98-CO-0046
Kathy, Peter and consultants Patti & Joan

The Trail Explorer Website <www.trailexplorer.org> continues development as a searchable on-line database to provide Trail Access Information on hiking trails in the U.S. and Canada. The Trail Explorer Website allows data to be easily uploaded from TrailWare to post on the site.

Training Program for UTAP Trainers

USDA SBIR Phase II Grant #00-33610-9415
Kathy, Peter and consultant Patti

A UTAP Trainer Course was held in June 2003 in Minden, Nevada. There are now 59 trainers available throughout the U.S. and Canada to train or assist with UTAP Coordinator Workshops.

National Highway Institute Course on Pedestrian Design

Peter & consultant Julie K

Peter and consultant Julie Kirschbaum (currently finishing her masters at MIT) have been teaching a course based on the two books that were created for the FHWA: "Designing Sidewalks and Trails for Access: A Best Practices Design Guide" and "A Review of Existing Guidelines and Practices." DOT roadway design engineers mainly attend the course. Both books are available through: <wwwcf.fhwa.dot.gov/environment/rt_pubs.htm>

Nevada Recreation Trails

Peter and consultant Patti

The goal of this project is to make Trail Access Information (TAI) widely available for a variety of trails in Northern Nevada. Phase I of this project assessed approximately seven miles of trails managed by five different agencies. Assessments were conducted by BD's trail assessment team consisting of Layne, Andrea, Kallie, Jason, and Ericka.

Surface Accessibility

NIH SBIR Phase II Grant #2 R44 HD30979-02
Denise & Peter

The Rotational Penetrometer is now being distributed by Beneficial Designs. This portable tool can measure the firmness and stability of trail surfaces, carpet, and other pedestrian routes. Denise is on the ASTM Committee that develops playground accessibility standards. Beneficial Designs continues to conduct playground surface accessibility testing (ASTM F1951) on a contract basis for surface manufacturers.

Canoe Seating System

NIH/NICHD SBIR Phase II Grant
#2 R44 HD36944-02A1
Allen, Denise, Seanna & Peter

BD will be working with Wilderness Inquiry in Minneapolis to refine the canoe seat design and conduct evaluations. The seat attaches to the sides of the canoe, replacing the existing seat. It provides back and side support to improve balance and comfort.

FlexRim

NIH/NICHD Phase II Grant #2 R44 HD36533-02A2
Mark, Peter & consultant Jamie

The FlexRim is a compliant handrim that replaces the rigid interface between the wheelchair wheel and the handrim. It adds flexibility to reduce the impact forces experienced by users. Subject evaluations will take place in 2004. The project is currently in Phase II and is expected to be complete in August of 2004.

GripRim

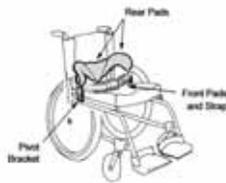
NIH/NICHD Phase I Grant #1R43 HD42875-01
Mark, Peter & consultant Jamie

The GripRim is an ergonomic handrim add-on that enhances the standard handrim. It is designed to provide an enhanced functional contact over the entire grip surface as well as improve the fit of the handrim to the hand. The project is currently being reviewed by NIH for Phase II funding.

HipGrip

NIH/NICHD Phase II Grant #2R44 HD36156-02A2
Allen, Denise, Seanna & Peter, and consultants Amy & Jamie

The HipGrip is a spring-loaded pelvic support device for persons who have difficulty maintaining pelvic positioning. It allows users to lean forward and then the device gently assists them back into an upright position. BD is currently completing the Phase II development work. The 3-6 month user evaluations are now complete and data analysis is underway. Bodypoint Designs signed a licensing agreement to distribute the HipGrip.



Ski Area Accessibility

Peter continues to consult for the ski industry, helping to make their facilities and programs more accessible. He is also chair of a RESNA committee that developed specifications and test methods for adaptive ski equipment. The document is under final revision and will soon become a national standard. The committee met in December of this year in conjunction with the annual Ski Spectacular event in Breckenridge, Colorado.



Wheelchair Standards

Paralyzed Veterans of America
Peter & Denise

As Chair of the RESNA Technical Standards Board, Peter oversees the work of all RESNA standards committees. Peter still serves as Chair and Denise as Secretariat of the RESNA Standards Committee on Wheelchairs. Annual meetings were held this year in conjunction with the RESNA conference in Atlanta. Peter also continues as Convener of the ISO Working Group on Wheelchair Test Methods. Peter attended ISO meetings in Zug, Switzerland in May and in Christchurch, New Zealand, with Denise in October.

Wheelchair Seating Standards

Allen, Denise & Peter

Denise, Allen, and Peter continue to participate in the development of ISO standards for wheelchair seating. These standards cover terms and definitions, and testing of postural support devices and seat cushions.

Adjustable Skeletal Loading Indenter

NIH/NICHD Phase I Grant #1R43 HD043509-01
Allen, Alida, Peter & consultant Jamie

Allen, Alida, Peter, and consultant Jamie have created an adjustable skeleton to simulate pelvic tilt, rotation, and obliquity, which is surrounded by gel to simulate soft tissue. The indenter will be made available for testing of seat cushions.

Design Consulting

We continue to provide testing and design services on a consulting basis for the seating and wheeled mobility industry. BD is still assisting Independence Technology, a Johnson & Johnson company, with the design of the seating system of the iBOT Mobility System <www.indetech.com>.

Wheelchair Training Guides

Denise & Peter

The Manual and the Powered Wheelchair Training guides provide wheelchair users and therapists with step-by-step instructions for negotiating various environments. Both books are available through PAX Press, a division of BD.



MEET THE BD TEAM

❖ **Peter Axelson**, founder and Director of R&D, leads BD and spends much of his time traveling throughout the world to attend meetings and present our work. He's also a pilot and avid mono-skier.

❖ **Denise Axelson**, Research Coordinator, oversees the research at BD and assists with technical writing and grant proposals. She loves to play volleyball, ski, and cook.

❖ **Allen Siekman**, Director of Seating & Design, oversees the seating and design projects. He restores antique autos and coaches and umpires youth softball teams.

❖ **Mark Richter**, Research Engineer, is working on the FlexRim, the GripRim, and product liability research. He just completed his doctorate in mechanical engineering at Stanford University.



❖ **Bill Blythe**, Technical Assistant, is in charge of things that plug in. He likes to cook, play guitar, work with computers, and lead worship at church with his wife Jennifer.

❖ **Jason Chiang**, Technical Assistant, helps with various projects. He enjoys playing basketball.

❖ **Kimberly Clarkston**, Project Engineer, conducts literature research, assists with subject recruitment, and product testing. She enjoys volleyball, rollerblading, and hiking.

❖ **Megan Crowe**, Office Assistant, contributes to various office duties. She is a senior in high school and enjoys trail horseback riding and motocross.

❖ **Shelly Guzman**, Office Assistant, helps with office tasks. She is a junior in a high school and enjoys dancing, traveling, and shopping.

❖ **Seanna Kringen**, Research Associate, assists with the research components of our projects. She enjoys swimming and hiking with her husband and three children.

❖ **Alida Lindsley**, Project Assistant, contributes to the design and fabrication of various prototypes. She plays Ultimate Frisbee, hikes, surfs, and enjoys the arts and creating.

❖ **Jamie Lummus**, Administrative Assistant, oversees office administrative functions. She enjoys scorekeeping for men's league softball, coaching cheerleading, and her Cairn Terrier.

❖ **Kathy Mispagel**, Project Coordinator, organizes UTAP projects and TrailWare development. She is excited about getting married to her fiancé, Harvey Newman, on February 16, 2004!

❖ **Russell Rodriguez**, Research Engineer, works on the FlexRim and GripRim while pursuing his masters in Biomedical Engineering. He enjoys wakeboarding, mono-skiing, hand cycling, tennis, basketball, and sled hockey.

❖ **Carla Shepard**, Bookkeeper, is in charge of BD finances. She enjoys four-wheeling, playing piano, singing, and cross-stitching.

❖ **Kevin Woods**, Project Engineer, works on the FlexRim and GripRim, while doing research for his masters in Biomedical Engineering. He enjoys hiking, Ballroom dancing, and restoring his 1890's Victorian home.



❖ **Amy Hayes**, Physical Therapist, works on the HipGrip project. She enjoys the outdoors, volleyball, hiking, and biking.

❖ **Patti Longmuir**, Research Scientist, focuses on accessible recreation projects. She enjoys the outdoors, and fixing up her house.

❖ **Jamie Noon**, Seating Designer, contributes to product development. He also works with non-profit organizations to establish clinics in developing countries that provide rehabilitation technology.



We would like to thank past employees Layne Aufenkamp, Andrea Forsyth, Kallie Goheen, Ericka MacCabe and Nathan Sanford whose work on our projects was invaluable. We also wish to thank consultants Mike Passo, Stacy Rose, Julie Kirschbaum, Joan Lowden, Jay Schaffer, and Dan Michaels who have made significant contributions to our projects this year. We are grateful to our technical consultants Bill Adams, John Endter, Arne Folkedal, and JD Tipton, Robyn, and Dan Morgan for their assistance with our facilities.