



Working toward
universal access
through research,
design & education

December 2005

Dear Friends & Supporters

We moved! After leasing space at the historic Minden Butter-Creamery building for five years, we moved to a newer building near the Minden airport. Please note our new contact information below.

The trails component of Beneficial Designs continues to grow as more and more attention is given to outdoor recreation access. Our standards work also continues to increase as more accessibility goals are accomplished through standardization of recreation environments and the products used in those environments.

We completed our seating related Small Business Innovation Research (SBIR) Grants and closed our Santa Cruz office during 2005. However, Seanna Kringen, Alida Lindsley, and Kathy Newman continue to work for us as consultants out of their home offices in Santa Cruz. Allen Siekman started his own consulting business and continues to offer seat cushion testing through his new company, Central Coast Testing.

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 happy new year.

Management Team

Peter Axelson

Mark Richter

Staff

Denise Axelson

Harmony Bennington

Bill Blythe

Paula Frey

Kimberly Lilley

Alicia Sturgess

Project Consultants

Seanna Kringen

Alida Lindsley

Patti Longmuir

Kathy Newman

Jamie Noon

Carla Shepard

Allen Siekman

Minden Office

2240 Meridian Blvd.
Suite C
Minden NV 89423
v 775.783.8822
f 775.783.8823

Mailing Address

PO Box 69
Minden NV
89423-0069

Santa Cruz Office

249 Shoreview Dr.
Aptos CA 95003
v 831.685.4798
f 831.685.4798

Nashville Office

3301 Cobble Street
Nashville TN 37211
v 615.837.6902
f 615.837.6908

Internet

mail@beneficialdesigns.com

www.beneficialdesigns.com

UTAP Coordinator Workshops

Paula, Peter and consultants Patti & Kathy

This year more trail enthusiasts were trained to lead assessments, using the Universal Trail Assessment Process, bringing the total number of UTAP Coordinators trained to over 750. Several UTAP Workshops are being planned for 2006. The next one will be held in Reno, Nevada 12-13 February during the Professional Trail Builders Conference. For workshop dates and locations, contact <trails@beneficialdesigns.com>.



Surface Accessibility

NIH SBIR Phase II Grant

#2 R44 HD30979-02

Peter & Denise

The Rotational Penetrometer (RP) is now being incorporated into ASTM F1951, the testing standard for playground accessibility, which is currently being revised. The RP is distributed by Beneficial Designs and can measure the firmness and stability of trail surfaces, carpet, and other pedestrian routes.



TrailWare^{2.0} UTAP Software

NIH/NICHHD SBIR Phase II Grant

#2 R44 HD36538-02

Peter and consultants Kathy, Seanna, Patti, Joan, John, Bill, Jay & Dan

TrailWare^{2.0}, data processing software for the UTAP is available to generate trail access information, signage and trail management reports. Several state agencies and organizations are using TrailWare for their trail assessment needs. The next TrailWare^{2.0} training will be held in Reno, Nevada 14 February 2006 during the Professional Trail Builders Conference.

Nevada Recreation Trails

Peter, Paula 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. We completed our 2003 project of assessing 11 trails managed by five different agencies and have just begun our 2005 project for assessing nine parks and trails managed by six different agencies in Northern Nevada. Each trail has Trail Access Information posted on fiberglass signposts at various access points to the trail.

Tahoe Meadows Interpretive Trail	
Length	1.5 mi (2.3 km)
Hiking	
Dogs On Leash	
Grade	
Typical Grade	2.3%
7% of the trail is 6%	
327 ft (100 m) is 7%	
2% grade is a standard ramp	
X-Slope	
Typical Cross Slope	2.0%
96% of the trail is 9% to 5%	
304 ft (93 m) is 6% to 10%	
Tread Width	
Typical Tread Width	7.5 ft (2.3 m)
Minimum Clearance Width	42 in (107 cm)
Surface Type	
Aggregate / Gravel	
62% is Firm or better	
1408 ft (429 m) is Soft or worse	
Obstructions	
Rock	2 inches high
Stick	1 inch deep
Road	2 inches high
<small>WARNING: This signpost has been placed at an access point to the trail. It is not intended to be used as a barrier or to restrict access to the trail. It is intended to provide information to trail users.</small>	
Trail Access Information	

High Efficiency Trail Assessment Process

USDA SBIR Phase II Grant

2005-03226

Peter, Bill, Paula & Mark and consultants Patti & Dan

Phase I of the research and development was completed for a portable data collection cart that will allow the Universal Trail Assessment Process (UTAP) to be completed by one person. Phase II began in 2005. This device will enable outdoor recreation and trail access routes to be assessed more efficiently.



Trail Access Information Signage



Tahoe Meadows Interpretive Trail
Lake Tahoe, Nevada

Canoe Seating System

NIH/NICHD SBIR Phase II Grant
#2 R44 HD36944-02A1

Peter & Denise and consultants Alida, Allen, Seanna & Patti

BD designed, evaluated and refined two seat systems for use in canoes. Wilderness Inquiry evaluated the seats in the field. The seat attaches to the sides of the canoe, replacing the existing bench seat. It provides adjustable pelvic, back, and side supports and has an adjustable seat angle to improve balance and comfort. Kevin Carr with Chosen Valley Canoe Accessories is preparing to manufacture and distribute the adaptive canoe seat.

Universal Design Guidelines for Fitness Equipment

NIH/NICHD Phase I Grant
#1 R43 HD049236-01

Peter, Bill & Paula and consultants Seanna, Patti & Jamie

The universal design of fitness equipment guidelines (UDFE) project is developing design, construction, and installation guidelines for the universal design of aerobic and strength training equipment. This research is also developing a model step-by-step process for the modification of existing equipment, a system for identifying universally designed products for consumers, and data on the cost-benefits of universally designed fitness equipment.



FlexRim

NIH/NICHD Phase II Grant
#2 R44 HD36533-02A2

Mark & Peter and consultant Jamie

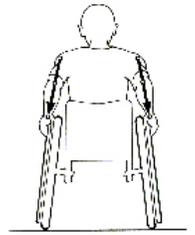
The FlexRim is a compliant handrim that replaces the rigid interface between the wheelchair wheel and the handrim. It adds flexibility to reduce the impact forces experienced by users. We are currently working on licensing agreements with potential manufacturers to make this product commercially available.

OptiFit

NIH/NICHD Phase I Grant
#1 R43 HD047071-01A1

Mark, Peter, Kim & Adam

The current state of knowledge in adjusting a wheelchair to fit a specific user is very limited. This Phase I project developed a systematic approach to optimally fit a wheelchair to an individual user so that seated posture and propulsion ergonomics are maximized. Subject testing has been completed and data analysis is in progress.

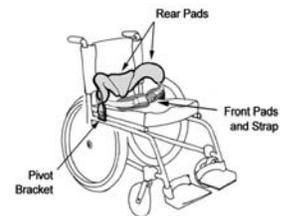


HipGrip

NIH/NICHD Phase II Grant
#2R44 HD36156-02A2

Peter & Denise and consultants Allen, Seanna, Amy Hayes & Jamie

The HipGrip is a dynamic spring-loaded pelvic support device for persons who have difficulty maintaining pelvic positioning. The HipGrip allows the user to lean forward and provides variable resistance to assist the user back into an upright position. Beneficial Designs successfully completed this project and the HipGrip is currently being manufactured and distributed by Bodypoint <www.bodypoint.com>.



Accessible Trail Gate Barrier

USDA SBIR Phase II Grant
2005-00325

Peter & Paula and consultants Patti, Seanna, Alida, Jamie & Mike Sealey

The goal of this project is to design a trail gate barrier that will restrict access to motorized trail vehicles that can increase the environmental degradation of the trail, but allow access to all non-motorized users and personal mobility devices. Current gates that allow mobility devices also allow small motorized vehicles, forcing land managers to choose between providing access to people with disabilities and protecting the trail environment. Four design

concepts have been created and we are drafting a proposal for Phase II support.

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 standards committee that developed specifications and test methods for adaptive ski equipment. The document has just gone through final balloting and will soon become a national standard.

The committee met in December 2005 in conjunction with the annual Ski Spectacular event in Breckenridge, Colorado.



conference in Atlanta. Peter also continues as Convener of the ISO Working Group on Wheelchair Test Methods. ISO meetings took place in Bristol, UK in May and in Atlanta, Georgia in November 2005.

Wheelchair Seating Standards

Denise & Peter

Denise 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.

Design Consulting

We continue to provide testing and design services on a consulting basis for the seating and wheeled mobility industry.

Wheelchair Training Guides

Denise & Peter

The Manual and 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.



Wheelchair Standards Paralyzed Veterans of America Research Program

Peter & Denise

As Chair of the RESNA Technical Standards Board, Peter oversees the work of all RESNA standards committees. Denise still serves as Secretariat. Annual meetings were held this year in conjunction with the RESNA

Special Thanks and Acknowledgments

We would like to thank past employees Shelly Guzman, Jamie Lummus, Andrew Mattson, and Kevin Woods whose work on our projects was invaluable. We also wish to thank additional consultants Amy Hayes, Mike Passo, Jean Minkel, and Dan Michaels who have made significant contributions to our projects this year. We are grateful to our technical consultants Bill Adams, John Endter, Tom Frazier, Eric Class, and Jay Frey for their assistance with our projects and facilities.

We would also like to thank Wilderness Inquiry for their assistance in the development and evaluation of the canoe seating system.

Funding agencies and other acronyms:

ISO International Organization for Standardization

NICHD National Institute of Child Health and Human Development

NIH National Institutes of Health

SBIR Small Business Innovation Research

RESNA Rehabilitation Engineering and Assistive Technology Society of North America

USDA United States Department of Agriculture

MEET THE BD TEAM

MANAGERS

❖ **Peter Axelson**, founder and Director of R&D, leads BD. When he is not traveling to present our work he loves spending time with Denise and Ria Maye. He's also a pilot and avid mono-skier.

❖ **Mark Richter**, Research Engineer, is working on the FlexRim, the OptiFit, and HETAP. Mark became a dad this year to his new son Trevor. Congratulations to Mark!

STAFF

❖ **Denise Axelson**, Research Engineer, assists with research and standards development work. She loves being a mom to Ria Maye, and enjoys playing volleyball, skiing, and cooking.

❖ **Harmony Bennington**, Office Assistant, helps with office tasks. She is a senior in high school and likes skiing, running, and helping others.

❖ **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.

❖ **Paula Frey**, Research Associate, is an occupational therapist and contributes to the research/clinical needs of our work. She organizes UTAP and trail assessments. She enjoys running, hiking and biking with her husband Jay.

❖ **Adam Karpinski**, Research Engineer, works on the FlexRim and OptiFit projects. Adam just completed his Master's degree in Biomedical Engineering from Vanderbilt University.

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

❖ **Alicia Sturgess**, Office Assistant, helps with office tasks. She is a junior in high school and likes to run track.

CONSULTANTS

❖ **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**, Product Designer, contributes to the design concepts for various projects. She plays Ultimate Frisbee, enjoys the outdoors, the arts, and creating.

❖ **Patti Longmuir**, Research Scientist, focuses on accessible recreation projects. She enjoys the outdoors, and is currently working on her Ph.D.

❖ **Kathy Newman**, UTAP Master Trainer, is on advisory status on trail-related projects. She is now a full-time mom!

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

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

❖ **Allen Siekman**, previous Manager of the Santa Cruz Design Center and seating designer, is now a project consultant. He continues to perform cushion testing through his new consulting business Central Coast Testing.

MEET THE BD TEAM

Peter



Denise



Mark



Bill



Seanna



Paula



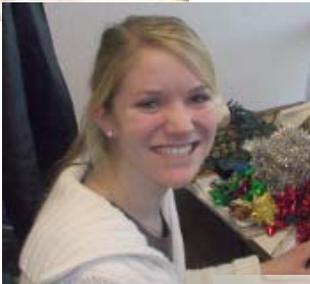
Kim



**Happy Holidays
from the
BD Team!**



Kathy



Carla



Alicia

Harmony



Adam

Jamie.

Allen

Patti

Alida