



Working toward
universal access
through research,
design & education

December 2013

Dear Friends & Supporters,

The Beneficial Designs' team had a busy year.

Our wheelchair test lab was quite busy this year and we continue to devote time and resources to wheelchair standards development. The trails and pedestrian access components of Beneficial Designs continue to grow. We are developing new technologies with USDA government-funded research and development that improve the efficiency of conducting assessments of outdoor recreation environments.

As a result of our work through our RERC RecTech on the Development of Uniform Standards for Accessible Fitness equipment, two standards addressing general criteria of all fitness equipment were published through ASTM this year. See news release:

www.astm.org/standardization-news/update/inclusiveuse-fitness-equipment-ja13.html

Our team for the RERC for the Advancement of Cognitive Technologies on the Development of Uniform Standards for Cognitive Technologies is seeking input on product usability, see:

www.facebook.com/CognitiveAccessibility

www.beneficialdesigns.com/universal-design-and-standards/development-of-uniform-standards-for-cognitive-technologies/survey

We are now offering sidewalk assessment services as a result of the successful completion of our Automated Public Right-of-Way Assessment Process and associated equipment that reduces the time to identify safety hazards and access issues in the sidewalk environment by 80 to 90%. The work was highlighted in the December 2013 issue of **"Wired"** Magazine.

We would like to share with you the status of our current projects and our successes over the last year. Thank you for your continued support of our work. We wish you the very best for the New Year!

STAFF

- ❖ **Peter Axelson**, Founder and Director of R&D, presents our work worldwide. He loves spending time with his daughter and is an avid mono-skier and pilot.
- ❖ **Bill Blythe**, Technical Assistant, he enjoys spending time with his wife, likes to cook, play guitar, work with computers, and leads music at his church.
- ❖ **Barton Cline**, Software Developer and Electronics Technician, enjoys in-depth Bible study, family time, languages (incl. computer lang.), and loves his job.
- ❖ **Jaime Skilling**, Marketing and Project Manager, is attending Law School and enjoys dancing and singing.
- ❖ **Stephen Pieters**, Technician, is happily married, enjoys riding motorcycles, fishing, and spending as much time as possible in the outdoors.
- ❖ **Paul Schnorbus**, Machinist, likes Legos, machining, target shooting, camping, and a well told story.
- ❖ **Samuel Schnorbus**, Shop Assistant, is attending classes at WNC and enjoys snowboarding, paintballing, and shooting.

- ❖ **Nathan Tolbert**, Sidewalk Assessment Coordinator, loves hiking, fishing, and camping with his wife and sons, and enjoys coaching high school basketball.
- ❖ **Sharon Vazquez**, Office Coordinator, loves to read, spend time with her family, and bake.
- ❖ **Cali Vazquez**, Youngest Recruit (Sharon's new baby girl), enjoys being held and looking cute.
- ❖ **Rebecca Wrucke**, Office Assistant, enjoys spending time with family. Also enjoys illustrating, photo-restoration, reading, music and is a newly minted tax-pro for the 2014 tax season.
- ❖ **Sierra Stulac**, Office Assistant, studying Psychology at UNR, loves to dance, run, and bake.

CONSULTANTS

- ❖ **Mary Axelson**, Technical researcher and writer for the Cognitive Technologies Standards project, loves to read, write, and roam the Colorado Mountains with her husband and teenage daughter.
- ❖ **Martin Clemons**, Electronics Circuit Designer, keeps busy with his wife Katie as a flight instructor and aircraft inspector on the side.
- ❖ **Harmony Hilderbrand**, her wedding photography business has taken off. She just completed training the new RESNA ATSB Secretariat and will finish up various tasks at BD as a consultant.
- ❖ **Ben Hubbard**, Graphic Artist, is currently traveling on charity work with his wife and loves to paint and hike.
- ❖ **Seanna Kringen**, Research Associate, focuses on universal design projects, enjoys traveling with her husband and three children.
- ❖ **Ted Nagel**, Graphic Artist, enjoys hanging out with Christian friends and loves entertaining, whether with his barbershop chorus, karaoke, or as a solo artist.
- ❖ **Kent Nelson**, Continues to assist Peter with the assessment of amusement park rides.
- ❖ **Mike Passo**, Outdoor Recreation Access Expert, Peter & Mike helped with the development of an accessibility plan for the San Francisco Bay Area Water Trails Network working with the California State Coastal Conservancy. Mike is consulting with the Developed Outdoor Recreation Assessment Process (DORAP).
- ❖ **Carla Shepard**, Bookkeeper, is now full time at Max Mobility, with past employee Mark Richter, making the new SmartDrive. Carla will continue to assist with our grant work accounting as a consultant.
- ❖ **Jo Anne Snarr**, Accountant, owner of The Balance Sheet, is our new bookkeeper working here in the Carson Valley. Jo Anne loves to ride her bike, ride horses and play golf when she is not crunching numbers.
- ❖ **Jeremy Vican**, Trails Assistant, enjoys hiking, photography, and trail related projects.

BOARD MEMBERS

- ❖ **Bill and Nancy Axelson**, Mr. and Mrs. Ax have long advised BD on a variety of financial, management and marketing issues. They continue to provide advice and guidance. Bill has an extensive background in sales and marketing. Nancy is an accomplished watermedia artist who was just juried in her 17th AWA show last fall.
- ❖ **Chris Lynskey**, is intimately familiar with the sidewalk assessment process and with his vast range of financial and management experiences, he is able to guide and advise BD when needed. He loves golf, skiing and gets regular exercise when he and his wife are walked by Micah their golden retriever.

UTAP & TrailWare^{2.0} Workshops

NIH/NICHD SBIR Phase II Grant #2 R44 HD29992-02

NIH/NICHD SBIR Phase II Grant #2 R44 HD36538-02

There are currently over 1,100 trail enthusiasts who have been trained to lead assessments using the Universal Trail Assessment Process (UTAP). Workshops have been held this year by the Florida Parks Service in April, by Northern Virginia Community College in November, and by Beneficial Designs at the Professional Trail Builders Association (PTBA) Conference in Albuquerque, NM in February, at the 21st American Trails International Trails Symposium in Phoenix, AZ in April, and at the Mid-America Trails and Greenways Conference near Chicago, IL in October.



Scheduled Trainings for 2014 include one in early January for the National Parks Service in San Francisco, CA and one on March 29, 2014 at the Texas Trails & Active Transportation Conference in Fort Worth, TX. Another training is tentatively scheduled as part of the PTBA Conference in April 2014. Beneficial Designs provides the UTAP training materials and tools through PaxPress while American Trails coordinates the training courses. TrailWare 2.0 can be used to generate Trail Access Information, signage, and trail management reports. Data is uploaded to www.trailexplorer.org, the TrailExplorer Website. For more information, contact trails@beneficialdesigns.com or visit www.americantrails.org.

Nevada Recreation Trails Program & NV State Parks

NVRTP Grant #FY 2008-22 & FY 2010-11

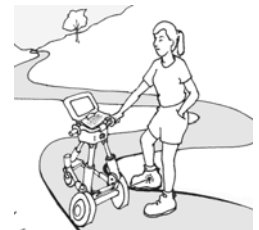
We are finishing our third Nevada Recreational Trails Program project to provide signage throughout Nevada. Our goal is to continue making Trail Access Information (TAI) widely

available in Nevada for a variety of trails and trail users. To date, we have assessed over 200 miles of trail in 26 different park areas. We have installed 15 different panel maps and over 100 TAI signs. We recently delivered another 58 panel maps and 118 more TAI signs that will be installed in 14 more Nevada State Parks.

High Efficiency Trail Assessment Process (HETAP)

USDA SBIR Phase II Grant # 2005-03226

This project created the Wheeled Instrumentation Sensor Package (WISP) to collect more accurate, objective information about trails, including shared-use paths, backcountry single-track trails, OHV, and cross-country ski trails. HETAP systems are being purchased by private entities, state and city land managers, and the National Park Service throughout the U.S. and Canada. This system has been commercially available through Beneficial Designs since 2009. HETAP workshops are available to help train personnel on using the HETAP software and hardware (see UTAP & TrailWare^{2.0} Workshops). A software update will be available soon that includes improved functionality. We are now able to create a custom summary report for your agency and embed it into your software. If you have been spending time translating the summary report into a format specific to your agency, send us that form and we will create a custom summary that you can install into your HETAP software. Contact trails@beneficialdesigns.com for more information.



Nature Trail

Fort Churchill
State Historic Park

Length 1.6 mi (2.5 km)

Elev Gain 45.2 ft (13.8 m)

Elev Loss 265.7 ft (81.0 m)

 Hikers

 Bikes

 Dogs on Leash

 No Equestrians

 No Motorized Vehicles

 Grade

Typical Grade 3.8%

8% of trail is 10% to 20%

132 ft (40 m) is 20% to 37%

Standard Ramp Grade 8.3%

**Trail Access
Information
Signage Sample**

Accessible Trail Gate Barrier

USDA SBIR Phase II Grant # 2005-00325

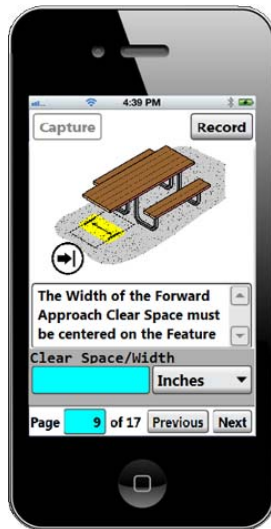
The Pedestrian and Motorized Vehicle Trail Traffic Counter is now available for commercial purposes. The counter is designed to identify and count trail entry and exit by both pedestrians and motorized vehicles. A mechanical trail gate barrier is also available to be used on its own or with the electronic

system. Contact trails@benficialdesigns.com for more information.

A Standardized Assessment Process of Outdoor Recreation Facilities (DORAP)

USDA SBIR Phase I & II Grant # 2008-33610-18906

With the Accessibility Guidelines for Outdoor Developed Areas (AGODA) becoming law for Title I entities in Nov 2013; it is only a matter of time before a similar version is adopted for Title II entities. BD was awarded a Phase II grant in 2013 to complete the development of the Developed Outdoor Recreation Assessment Process (DORAP). This project will create repeatable measurement methods for assessing the accessibility of outdoor constructed features found in outdoor recreation areas such as parks and campgrounds. A process and collection method will be created to assess the 18 features defined in AGODA. These features include among others: picnic tables, tent pads, outdoor rinsing showers, grills, and fire rings. The result of this project will include the collection process provided in a mobile app that will be available for select mobile platforms.



Public Right-of-Way Assessment Process to Determine Accessibility

US DOT #DTRT57-08-C-10058 & DTRT57-10-C-10081

Beneficial Designs has developed the automated Public Right-of-Way Assessment Process (PROWAP) that systematically measures elements within the pedestrian environment, such as curb ramps, severe cross slopes, trip hazards, and pathway obstructions. We have been able to reduce the time to perform assessments by 80-90% of the time generally required to perform assessments manually. In addition to the assessment cart, we have wireless devices to measure tripping hazards and linear measurements of features and sidewalk panels. We have recently contracted work with

the Nevada Department of Transportation and another local agency to provide assessment services. We are actively seeking out opportunities to provide assessment work for other agencies to help them prepare their federally required ADA Transition Plans for the sidewalk environment. The PROWAP System recently received national recognition in a profile in the December 2013 issue of "Wired" magazine.



Surface Accessibility

NIH/NICHD SBIR Phase II Grant #2 R44 HD30979-02

The Rotational Penetrometer (BDRP) measures the firmness and stability of indoor and outdoor surfaces, including: trail surfaces, carpet, and other pedestrian routes. An updated version of the RP will soon be available through Beneficial Designs.

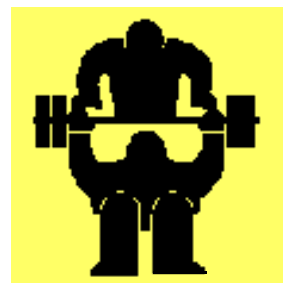


Universal Design Guidelines for Fitness Equipment (UDFE)

NIH/NICHD SBIR Phase I Grant #1 R43 HD049236-01
RERC NIDRR Grant #H133E070029 & H133E120005

ASTM F3021 and F3022 Standards for UDFE Specifications and Test Methods are now published and available through www.astm.org.

We are now in year two of another five-year RERC



RecTech with the University of Alabama at Birmingham and are currently focusing on universal design criteria for specific equipment, such as bicycles and treadmills. This work is creating a set of internationally applicable ASTM Standards on universal design specifications for the manufacturers of accessible fitness equipment. The RESNA Standards Committee on Inclusive Fitness was founded to develop disclosure guidelines, information, and/or formats to: (1) disseminate

information to the fitness industry that facilitates non-discriminatory access for people with disabilities and (2) develop an inclusive access mark to identify fitness facilities and equipment that meet access requirements for people with disabilities.

Development of Uniform Standards for Cognitive Technologies

RERC NIDRR Grant #H133E090003 and the Coleman Institute for Cognitive Disabilities.

We are in year four of a five-year RERC on the Advancement of Cognitive Technologies (ACT) through the University of Colorado. We are working closely with the RERC and cognitive disability groups and individuals in order to develop universal design standards for products used daily by people with cognitive impairment, such as cell phones and other consumer products. This project houses the RESNA Standards Committee on Cognitive Technologies (CT), whose goal is to develop universal design standards to increase product usability. The next RESNA CT meeting is on January 30, 2014 in conjunction with the ATIA Conference in Orlando, FL. All are welcome to attend this conference, visit www.atia.org.

Adaptive Ski Equipment Standards

Peter is the Chair of the RESNA Standards Committee on Adaptive Sports Equipment (ASE) that developed specifications and test methods for adaptive ski equipment. A new version of the American National Standard, RESNA ASE-1, is scheduled to be published in 2014. The committee meets each year in December in conjunction with the Ski Spectacular event in Breckenridge, Colorado.



Wheelchair Standards

PVA & Beneficial Designs

As Vice-Chair of the RESNA Standards Committee on Wheelchair (WCS), Peter is the US delegate to the ISO Wheelchair standards work and is the primary leader responsible for the development of the existing RESNA Wheelchair standards. BD conducts

experimental testing to develop new test procedures to keep up with the development of new technologies.

AT Standards

RESNA & Beneficial Designs

As Vice-Chair of the RESNA Assistive Technology Standards Board (ATSB), Peter oversees the work of the RESNA Assistive Technology Standards (ATS) Committees. There are 12 ATS Committees that develop National ATS for the US, while harmonizing where possible with International standards, such as those developed through ISO. RESNA WC-4:2012 Wheelchairs and Transportation and RESNA ASE-2:2012 Adaptive Golf Cars were published in 2012. RESNA ED-1:2013 Emergency Stair Travel Devices Used by Individuals with Disabilities and RESNA WC-3:2013 Wheelchair Seating were published in 2013. RESNA ATS are available for purchase through the RESNA store at www.resna.org.

Wheelchair Testing & Design

We continue to provide testing and design services on a consulting basis for the wheelchair industry. For more information, contact mail@beneficialdesigns.com.

Wheelchair Training Guides

PVA Research and Education Foundation

The 2nd Edition of the Manual Wheelchair Training Guide has just been updated, revised, and published. The Powered Wheelchair Training Guide and A Guide to Wheelchair Selection also provide wheelchair users and therapists with step-by-step instructions for selecting wheelchairs and negotiating various environments. These books are used as textbooks by professors teaching courses for future occupational and physical therapists. PaxPress, a division of Beneficial Designs, is now distributing the books electronically through Amazon and Nook. Contact paxpress@beneficialdesigns.com for more information or see our website at www.beneficialdesigns.com.

FlexRim®

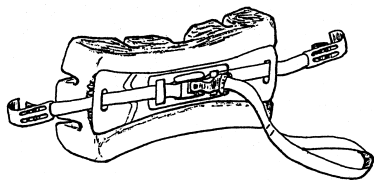
NIH/NICHD SBIR Phase II Grant #2 R44 HD36533-02A2

The FlexRim® is a compliant handrim that replaces the rigid interface between the wheelchair wheel and the handrim, reducing the gripping force and the impact forces. The FlexRim is manufactured by Spinergy and has been commercially available since September of 2007. For more product information, please visit Spinergy www.spinergy.com or Max Mobility www.max-mobility.com.

PaxBac

NIH/NICHD SBIR Phase II Grant #2 R44 HD29983-02

The PaxBac is a lightweight back support that provides lumbar/sacral back support on wheelchairs with sling upholstery. It was manufactured by Invacare for a limited time. It will soon be manufactured again by BES Rehabilitation, Ltd. and will be distributed in the U.S. by Bodypoint at www.bodypoint.com.



Canoe Seating System

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

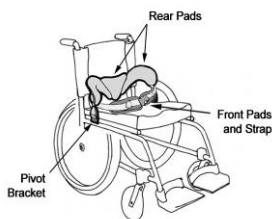
The Universal Design Canoe Seat is now commercially available. The seat replaces or attaches to the existing bench seat in a canoe. It provides adjustable pelvic, back, and lateral supports to improve balance and comfort. For more information, contact Chosen Valley Creating Ability at www.creatingability.com.



HipGrip

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

The HipGrip is a dynamic, spring-loaded pelvic support device for people who have difficulty maintaining pelvic positioning in their wheelchair. The HipGrip allows the user to lean forward and provides variable resistance to assist the user back into



an upright position. The HipGrip is manufactured and distributed worldwide by Bodypoint. For more information, contact Bodypoint at www.bodypoint.com.

Expert Witness Services and Forensic Testing of Mobility Devices

As an expert on mobility devices, Peter Axelson has been able to help represent many claims based on evidence found in testing. Peter has been an expert witness in over 90 cases throughout the United States and continues to support and represent both plaintiffs and defendants. To discuss a specific case or to learn more about Beneficial Designs' expert witness services please contact peter@beneficialdesigns.com.

Funding Agencies and other Acronyms:

DOT	Department of Transportation
DORAP	Developed Outdoor Recreation Assessment Process
ISO	International Organization for Standardization
NICHD	National Institute of Child Health and Human Development
NIDRR	National Institute on Disability and Rehabilitation Research
NIH	National Institutes of Health
NVRTP	Nevada Recreational Trails Program
PVA	Paralyzed Veterans of America
PROWAP	Public Right-of-Way Assessment Process
RERC	Rehabilitation Engineering Research Centers
RESNA	Rehabilitation Engineering and Assistive Technology Society of North America
SBIR	Small Business Innovation Research
USDA	United States Department of Agriculture

Special Thanks & Acknowledgments

- ❖ **Past Consultants:** Eric Class and Patti Longmuir.
- ❖ **Past Employees:** Harmony Hilderbrand, Harvie Keith, and Evelyn Wheeler.
- ❖ **Past Interns:** Lia Poeder and Michelle Hoogwout.