December 2020

beneficial designs

designing beyond the norm to meet the needs of all people

2020 newsletter

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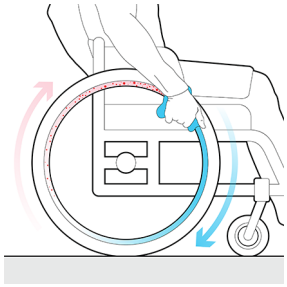
2020 Beneficial Designs Newsletter

Dear Friends and Supporters,

Like most of the world, Beneficial Designs had an atypical year. Peter and Kent Nelson had just completed a presentation to the Air Carrier Access Advisory Committee in Washington D.C. on March 11 in Washington D.C., when our nation's Capitol began shutting down work and travel.



When the pandemic first started, Peter immediately addressed the importance of cleaning wheelchairs and other assistive technology to prevent the spread of the virus. An illustrated document and a video were created, explaining the steps necessary to clean assistive technology to prevent the spread of the COVID-19 virus. The memo and video are both available on the BD website. Peter was interviewed regarding this information on May 20 by Fox News CoronavirusNOW.com and has had numerous other inquiries regarding this best practice. The document was used by at least 30 different entities, including the VA, PVA, RESNA, RESJA, Oregon Health Authority, Disabled Sports, Sunrise Medical, and many more. The document has been made available to at least 23 countries and translated into at least 15 different languages. If assistance is needed putting the information into a useful format for your organization, contact ben@beneficialdesigns.com.

News about our other work and history was highlighted in several places this year. In January, Peter gave his annual lecture to the Perspectives in Assistive Technology class at Stanford, a 60-minute presentation on Universal Design philosophies and past and present work that Beneficial Designs (BD) has been allowed to accomplish.

In September, Peter was chosen to receive the Colin McLaurin Distinguished Lectureship Award, and he will be presenting a keynote lecture at the 2021 RESNA Conference (7–10 July 2021).

Peter and Seanna published a peer-reviewed paper in the journal Disability and Rehabilitation: Assistive Technology: "Use of Two Test Methods to Ensure Accurate Surface Firmness and Stability Measurements for Accessibility." This 2017 study demonstrated the correlation between an instrumented surface indenter and the ASTM F1951 wheelchair work method. We still have a limited number of free copies available. If you would like a copy please contact us at surfaces@beneficialdesigns.com.

BD has a long history of supporting internships. Gabie Markley, an occupational therapy intern from the University of Toledo, has joined us for the spring semester. Read more on page 4.

Standards development, testing of mobility devices, and the assessment of sidewalks and trails continues to keep the BD staff working hard. The new standards committee on Assistive Technology for Air Travel has been working to address assistive technologies for air travel, with committee membership including representatives from the airlines, DOT, FDA, disability groups, and wheelchair manufacturers. Peter was asked to join a working group examining the feasibility of allowing some wheelchairs to be used on aircraft. We have also continued work on standards for the universal design of fitness equipment, the cognitive accessibility of everyday technologies, and adaptive ski equipment. The trails and pedestrian access components of Beneficial Designs continue to grow.

Thank you for your continued interest in our work.
We wish you the very best for 2021!

Projects

Wheelchair Testing & Design

As a primary area of work, BD provides RESNA, ISO, PDAC, and VA testing and design services on a consulting basis for the manual and powered wheelchair industry. For more information, contact mail@beneficialdesigns.com.

Public Right-of-Way Assessment Process to Determine Accessibility

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

Beneficial Designs developed the automated Public Right-of-Way Assessment Process (PROWAP) that trained assessment coordinators to systematically measure elements within the pedestrian environment, such as curb ramps, severe cross slopes, vertical discontinuities, and pathway obstructions. We are able to reduce the time to perform assessments by up to 80% of the time generally required to perform assessments manually. The system uses wireless devices to measure vertical discontinuities and make linear measurements of features and sidewalk panels. We offer sidewalk assessment services throughout the US. We continue to assess college campuses, metro stations, rest stops, and aspects of public right-of-ways in municipalities. We are currently measuring sidewalks adjacent to Nevada DOT right-of-ways and are preparing to assess rest stops and newly constructed or rebuilt public right-of-ways across the state. For the rest stops, BD will also be drafting ADA transition plans. The PROWAP System received national recognition in a profile in the December 2013 issue of Wired magazine and an SBIR success story. For more information visit our sidewalk assessment web pages.

Surface Accessibility

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

The series 100 Rotational Penetrometer (RP) is an Instrumented Surface Indenter (ISI) designed to measure the firmness and stability of all types of surfaces. The Series 100 RP model has increased accuracy and uses a calibrated spring and indenter to measure with a resolution of 0.005 inches. Parks, recreation programs, and school systems use this technology to ensure that the surfaces of their playgrounds, trails, and access routes are kept in firm and stable condition. When the DOJ published the 2010 ADA Standards for Accessible Design (15 Sept. 2010), the standards were expanded to include requirements for playgrounds. The requirements state that ground surfaces shall be inspected and maintained regularly and frequently to ensure continued compliance with ASTM F1951. The RP ISI results correlate with ASTM F1951 test results as shown in the peer-reviewed article "Use of Two Test Methods to Ensure Accurate Surface Firmness and Stability Measurements for Accessibility." We have a limited number of free copies of this peer-reviewed article available.

A settlement agreement was reached in May 2020 between the United States of America and the Iowa City Community School District under the ADA. The BD RP ISI was used to objectively assess the problem of a lack of firmness and stability on playgrounds and is being used to monitor ongoing conditions. If you would like to obtain a copy of the report, check this DOJ link.

BD regularly performs laboratory and field testing of surfaces using the RP ISI and ASTM F1951. For ordering information, please visit our website or contact us at surfaces@beneficialdesigns.com.

SmartTool™ with Smart Feet

The SmartTool™ offers objective and detailed slope measurements in degrees, percent slope, and pitch to 0.1 degree of resolution and accuracy.

The SmartFeet are precision-machined feet added to both ends of the 24-inch (60-cm) SmartTool™ level to prevent teetering on uneven surfaces. Teetering can cause significant measurement errors and is common on all types of surfaces. The position of the feet can be adjusted to measure a grade or cross-slope over a distance of up to 24 inches, representing the stance of a typical person moving across a path of travel, with or without the use of adaptive equipment. One of the two feet is wider creating three points of contact to reduce tipping in the lateral direction. A SmartStrap is also included, enabling easy measurement without the need to bend over. Contact us for more information at trails@beneficialdesigns.com.

Universal Trail Assessment Process & High Efficiency Trail Assessment Process (UTAP & HETAP) Workshops, Equipment, and Services

NIH/NICHD SBIR Phase II Grant #2 R44 HD29992-02
NIH/NICHD SBIR Phase II Grant #2 R44 HD36538-02
USDA SBIR Phase II Grant #2005-03226

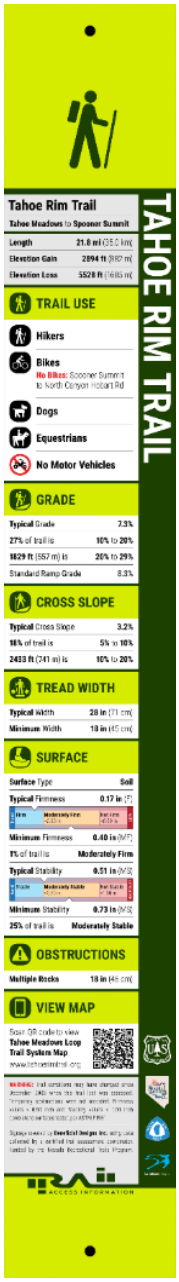
Currently, over 1800 trail enthusiasts have been trained to lead assessments using the Universal Trail Assessment Process (UTAP) and/or the High Efficiency Trail Assessment Process (HETAP). Trainings are typically held twice a year at conferences, but private trainings can also be scheduled. Beneficial Designs provides the UTAP/HETAP training materials and tools through PaxPress, while American Trails coordinates training courses. HETAP 2.5 or 3 software and TrailWare 2.0 can be used to generate Trail Access Information, signage, and trail management reports.

The Lakeshore Foundation, which provides BD's HETAP equipment for rent in Alabama, put together a short video that explains the benefits of providing TAI. An additional video was produced, which highlights our HETAP and UTAP equipment, services, and training.

The Wheeled Instrumentation Sensor Package (WISP), available on HETAP equipment, collects higher accuracy objective information about trails, including shared-use paths, backcountry trails, single-track trails, OHV routes, and cross-country ski trails. HETAP systems are being purchased throughout the U.S. and Canada by private entities, state and city land managers, and the National Park Service.

Beneficial Designs also provides trail assessment and mapping services. We have assessed almost 500 miles of trail in over 50 Nevada State Parks, including nearly 400 TAI SignPosts and over 100 panel maps. BD has also assessed trails and created signage and/or digital map information (GIS or kmz files) for local, state, and federal government entities in several other states. Trail assessments can also be paired with DORAP assessments of trailhead amenities (see below).

For more trails-related information, please visit our trail assessment website, contact us at trails@beneficialdesigns.com, or visit www.americantrails.org.



Digital Tread Squared (DT^2)

With two SmartTool levels attached perpendicular to one another on an assessment wheel, BD's DT^2 is a lightweight, upgradeable tool designed for measuring distance, grade, and cross slope on a variety of surfaces, while reducing the number of times an assessor needs to squat or kneel. Developed as a tool to use with a mobile device, the DT^2 is now available for purchase to use in trail, access route, public right-of-way, or clear space assessments—or any time an accurate grade or cross-slope measurement is needed. For ordering information, please visit our Beneficial Designs Square Site.

Trail Access Advocacy Plan (TAAP)

Gabie Markley's Capstone Project with the University of Toledo is entitled "Occupational Therapy's Role in the Promotion of Trail Accessibility." She will implement a needs assessment during the initial six weeks to evaluate the current trail assessment processes and dissemination methods for trail access information. The needs assessment will direct the development of a Trail Access Advocacy Plan. Gabie will complete formal training in the UTAP and HETAP Trail Assessment Processes and hike trails in the area that have already been assessed. She intends to interview hikers to verify the readability and effectiveness of the trail access information for decision making when planning hikes. The collected information will be used to write and publish a journal article identifying and discussing the value of occupational therapists in the enhancement of trail accessibility and engagement in outdoor recreation.

Universal Design Guidelines for Fitness Equipment (UDFE)

NIH/NICHD SBIR Phase I Grant #1 R43 HD049236-01
RERC NIDRR Grant #H133E070029 & H133E120005
RERC NIDILRR Grants # 90RE5009-01 & 90REGE0002-01-00

We have successfully completed an additional year of the RERC RecTech grant with the University of Alabama at Birmingham to complete a harmonized set of International ASTM Standards on universal design specifications for mainstream accessible fitness equipment. ASTM general (F3021/F3022), strength equipment (F2276/F2277), elliptical (F2810/F2811), treadmill (F2115/F2106), and cycle (F1250/F3023) standards for UDFE specifications and test methods are now published and available through www.astm.org.

In addition, on April 30, 2019, Senator Tammy Duckworth re-introduced S.1244, the Exercise and Fitness for All Act. Representative Mark DeSaulnier introduced the bill in the House of Representatives as H.R.4561 on September 27, 2020. The bill would require the Access Board to develop accessibility guidelines within 18 months for exercise or fitness service providers regarding the provision of accessible exercise or fitness equipment. The bill would also require DOJ to issue regulations regarding the provision of accessible exercise or fitness equipment and accessibility of exercise or fitness classes and instruction.

This year, the RESNA Standards Committee on Inclusive Fitness (IF) re-published the ANSI/RESNA Standard for Inclusive Fitness—Volume 1: Inclusive Fitness Environments, which contains: Section 1: Providing and Marketing Inclusive Fitness Environments, Section 2: Disclosure of Published Methods and Requirements for Creating Inclusive Fitness Environments and Implementing Inclusive Fitness Practices, and Section 3: Specifications, Test Methods, and Best Practices for Facility Accessibility. As Chair of the RESNA IF committee, Stephanie is working with experts on two additional sections regarding information

disclosure and training and certification for fitness center staff. The committee is actively recruiting experts in these areas. For more information, visit the RESNA IF website.

Development of Uniform Standards for Cognitive Accessibility

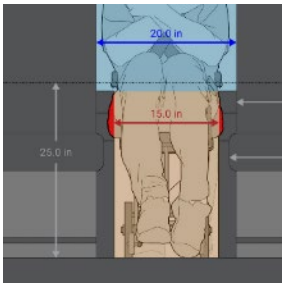
RERC NIDRR Grant #H133E090003 & H133E140054
The Coleman Institute for Cognitive Disabilities
RERC NIDILRR Grant #90RE5019-01-00

We have completed two five-year RERC for Advancing Cognitive Technologies (RERC-ACT) projects through the University of Colorado. This project launched the RESNA Standards Committee on Cognitive Accessibility (CA), whose goal is to develop universal design standards to increase product usability of consumer products.

As Chair of RESNA CA, Stephanie is taking an active role in collaborating on international standards with ISO/TC 173/WG 10 Assistive products for cognitive disabilities. Portions of RESNA CA-1:2018 Universal Criteria for Reporting the Cognitive Accessibility of Products and Technologies are being incorporated into a new ISO draft standard. RESNA CA meetings are open to all. For additional information, visit www.facebook.com/CognitiveAccessibility.

Air Travel Standards

RESNA & Beneficial Designs



The Paralyzed Veterans of America Research Foundation supported a project to study Airline Travel: Technologies for Non-ambulatory Passengers (PVA Grant #3028), As a result of this research, Peter led the development of the RESNA Standards Committee for Assistive Technology for Air Travel (ATAT). This committee is made up of airline carriers, disability groups, and wheelchair manufacturers to draft standards related to air travel for non-ambulatory passengers. The guideline is creating standards for mobility device features that will reduce the likelihood of being damaged, standardize the handling procedures for storage of assistive technology on aircraft, and streamline the information-gathering process for passengers who use assistive technology. Two sections have been drafted and have been out for committee pre-balloting review. This work was mentioned in a December 2019 article in Undark Magazine. For more information visit the RESNA ATAT website.

Peter was also asked to participate in a National Academy of Sciences study on the technical feasibility of wheelchair users to be secured in their wheelchairs onboard aircraft similar to the way wheelchair users currently ride buses.

Wheelchair Standards

PVA & Beneficial Designs

As Secretary of the RESNA Standards Committee on Wheelchairs (WCS), Peter is a US delegate to the ISO Wheelchair standards work. BD conducts experimental testing to develop new test procedures to keep up with the development of new technologies. Peter is typically the only wheelchair user representing the voice of veterans and other wheelchair users at ISO international meetings. This is important since the RESNA national standards committee typically adopts the ISO standards in some form. The RESNA national standards were approved for republication in 2019, and new clauses included in them are being considered for inclusion in the ISO Wheelchair standards.

Adaptive Ski Equipment Standards

RESNA & Beneficial Designs

Peter is the Secretary of the RESNA Standards Committee on Adaptive Sports Equipment (ASE), developing specifications and test methods for adaptive ski equipment. A revision of the American National Standard, RESNA ASE-1, was published in 2019 that includes a new test procedure for restraint harnesses for skiers that are prone to seizures. The committee meets each year in conjunction with the Ski Spectacular event in Breckenridge, Colorado in December. For more information visit the RESNA ASE website.

Wheelchair Training Guides

PVA Research and Education Foundation

The 2nd edition of The Manual Wheelchair Training Guide, The Powered Wheelchair Training Guide, and A Guide to Wheelchair Selection provide wheelchair users and therapists with step-by-step instructions for selecting wheelchairs and for training manual and powered wheelchair users on how to safely negotiate various environments. These books are used as textbooks by professors teaching courses for future occupational and physical therapists. Paperback editions are available directly through Beneficial Designs or through Amazon. PaxPress, a division of Beneficial Designs, is distributing the books electronically through Amazon and Nook. Contact paxpress@beneficialdesigns.com for more information or see our Beneficial Designs website.

Commercially Available Assistive Technology

Canoe Seating System—NIH/NICHD SBIR Phase II Grant #2 R44 HD36944-02A1

The Universal Design Canoe Seat replaces or attaches to the existing bench seat in a canoe or kayak. It provides adjustable pelvic, back, and lateral supports to improve balance and comfort. For more information, visit Creating Ability.

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 was being manufactured and distributed worldwide by Bodypoint. For more information, Google “HipGrip pelvic stabilization device.”

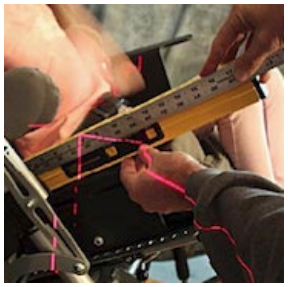
FlexRim®—NIH/NICHD SBIR Phase II Grant #2 R44 HD36533-02A2

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. For more product information, visit Spinergy.

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. We hope to get this bask support into production once again.

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 throughout the United States and continues to support and represent both plaintiffs and defendants. To discuss a specific case or to learn more about expert witness services, please contact peter@beneficialdesigns.com.

Special Thanks & Acknowledgments

Past Employees and Consultants

Samuel Schnorbus, Assessment Technician, is now pursuing becoming a licensed civil engineer.

Funding Agencies and Other Acronyms

DOT	Department of Transportation
ISO	International Organization for Standardization
NICHD	National Institute of Child Health and Human Development
NIDILRR	National Institute on Disability, Independent Living, and Rehabilitation Research
NIDRR	National Institute on Disability and Rehabilitation Research, now NIDILRR
NIH	National Institutes of Health
PVA	Paralyzed Veterans of America Research and Education Program
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


Peter and Ria Axelson


Bill Blythe


Maegan Elkaraki


Debbie Hester


Ben Hubbard


Travis MacDonald


Rob Palmer


Stephen Pieters

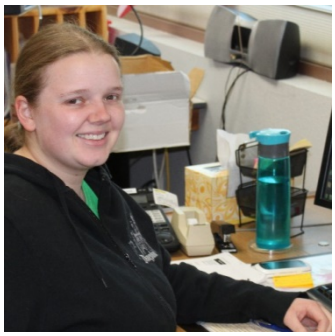

Paul Schnorbus


Alexa Schreckengost


Emery Schreckengost


Stephanie Stephens


Paola Vazquez


Sharon Vazquez


Todd Ackerman

Staff

Peter Axelson	Founder and Director of R&D, presents our work worldwide. He loves spending time with his daughter, Ria, and is an avid mono-skier and pilot.
Ria Axelson	Office Assistant, enjoys reading, playing volleyball on a club team, and traveling with her father in their light aircraft.

Bill Blythe	Facility Manager, enjoys spending time with his wife; likes to cook, play guitar, and work with computers; and leads music at his church.
Maegan Elkaraki	Bookkeeper/Research Assistant, enjoys spending time with her husband and children, and enjoys a good book and playing the piano.
Debbie Hester	GIS Coordinator, provides GIS expertise to our trail and sidewalk assessment projects, and enjoys traveling with her husband and son.
Ben Hubbard	Graphic Artist, enjoys time with his wife and children, painting, reading, learning, and hiking.
Travis McDonald	Assessment Technician, enjoys backpacking, reading, puzzles, indoor rock climbing, running, ceramics, and music.
Rob Palmer	Assessment Technician, assists in sidewalk and trail assessments; absolutely loves spending time with family; enjoys camping, hiking, and building play structures for his children; and also serves as a volunteer for the local Sheriff's Search and Rescue.
Stephen Pieters	Wheelchair Technician, enjoys riding motorcycles, fishing, and spending time outdoors.
Paul Schnorbus	Machinist, likes Legos, machining, target shooting, camping, and a well-told story.
Alexa Schreckengost	Office Assistant, a student at UNR, loves spending time with her husband and family, reading a good book, solving puzzles, and cooking delicious meals.
Emery Schreckengost	GIS Analyst/Assessment Technician, provides GIS expertise to our trail and sidewalk assessment projects, and enjoys music, hiking, reading, and traveling.
Stephanie Stephens	Research Assistant, lives in India with her husband, where she continues to work for Beneficial Designs, is learning to cook amazing food, and gets to ride in autorickshaws.
Paola Vazquez	Office Assistant, attends WNC and enjoys being with family, jogging, and working with children.

Consultants

Todd Ackerman	Trail and Sidewalk Assessment Coordinator, leads trail and sidewalk assessments and enjoys outdoor activities, traveling with his wife, and teaching the trail assessment process.
George Clary	Technical Consultant, assists with amusement park ride recommendations and provides input on electromechanical system design, forensic testing, and assessment technologies.
Nathan Tolbert	Sidewalk Assessment Trainer and Project Coordinator, loves hiking, fishing, and camping with his wife and sons, and enjoys coaching a variety of sports.
Sharon Vazquez	Administrative Assistant, enjoys spending time with family and friends, reading, and living life.

Board Members

Chris Lynskey	Chris is experienced in the sidewalk assessment process and has a vast range of financial and management experiences. He loves golf and skiing, and gets exercise when he and his wife are walked by Micah, their golden retriever.
Kent Nelson	Kent is a UTAP trainer who also assists with designing amusement park ride recommendations. For BD as a whole, he offers valuable advice based on common sense and an ability to see to the heart of issues.