Beneficial Designs

research/design/education

Designing beyond the norm to meet the needs of all people.

Working toward universal access through research, design & education

December 2019

Dear Friends & Supporters,

Beneficial Designs had an eventful year. This newsletter will update you on our work and projects, but the most sobering and difficult event of the year was the death of our colleague, Seanna Kringen. Following a series of brain bleeds beginning January 3rd of 2019, Seanna passed away in April. Our team has worked together this year to pick up and continue the many tasks she faithfully and passionately completed for the almost two decades she worked for BD. We miss her expertise, professionalism, attention to detail, and passion, but most of all, we miss her. Seanna left us at only 49 years old due to rare genetic disorder that caused her brain vessels to become brittle. If you would like more information you can look at the CaringBridge website. Please keep Seanna's family in your thoughts and prayers including her husband Steve and their children Bryan, Leci, and Brandyn.

News about our work and history was highlighted in several places this year. In February, Peter gave his annual lecture to the Perspectives in Assistive Technology class at Stanford, a 60-minute presentation on Universal Design philosophies, what Beneficial Designs (BD) has accomplished over the decades, and what we are doing now.

In June, Nathan and Sam teamed up with Glenn Dea at the ADA Symposium in Grapevine, Texas to present our joint work in assessing college campus environments for compliance with the ADA and helping the colleges to prepare ADA transition plans.

In December, Peter's work on the draft for the RESNA Assistive Technology for Air Travel standards was mentioned in an article in Undark Magazine exploring emerging solutions to the difficulties of air travel faced by people who use wheelchairs. The article also mentioned work done by the RESNA committees on Wheelchair and Wheelchairs and Transportation. Click here to read the article.

Beneficial Designs assisted the RESNA office this year, with the final editorial work and formatting of the RESNA Volume 1 and 2 Wheelchair standards for publication. The standards were just republished on 5 December 2019.

A presentation explaining trails and accessibility information, including Trail Assessment Information (TAI), remains available from Lakeshore, which provides BD's High-Efficiency Trail Assessment Process (HETAP) equipment for rent in Alabama. See the short 6-minute web video on our website.

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 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; click here for an application.

Standards, testing, and projects continue to keep the BD staff and consultants working hard. The new standards committee on Assistive Technology for Air Travel has been working to draft four new sections to address assistive technologies for air travel, with committee membership including representatives from the airlines, DOT, FDA, disability groups, and wheelchair manufacturers. We have also continued work on standards for the

universal design of fitness equipment, the cognitive accessibility of everyday technologies, and adaptive ski equipment. 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 and commercializing new technologies that improve the efficiency of conducting assessments of outdoor recreation environments. We are also analyzing data gathered in our PVA-funded research on assistive technologies to improve air travel comfort and safety for wheelchair users.

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

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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 for her school, and skiing 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.
- **Kyle Hollingshead**, Part-time Assistant, writes code to assist with data conversion in our sidewalk and trail assessment projects, and enjoys off-roading, swimming, dabbling with computers and electronics, playing piano, photography, and video games.
- **Ben Hubbard**, Graphic Artist, enjoys spending time with his wife and children, painting, reading, learning, and hiking.
- **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.
- **Samuel Schnorbus**, Assessment Technician, trains and performs assessments nationwide, graduated from UNR, and enjoys any activity with his friends and family.
- **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, a recent graduate from UNR, 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.
- **Martin Clemons**, Electrical Engineer, designed the HETAP 3 and PROWAP electronics and firmware.
- **Barton Cline,** Software Developer and Electronics Technician, assists with maintaining and improving HETAP and PROWAP software and equipment.
- **Tip Ray,** Trail Assessment Coordinator, helps with trail assessments.
- **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** is experienced in the sidewalk assessment process and has a vast range of financial and management experiences. He loves golf, skiing, and gets exercise when he and his wife are walked by Micah their golden retriever.
- **Kent Nelson** 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.

Universal Trail Assessment Process & High Efficiency Trail Assessment Process (UTAP & HETAP) 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 1800 trail enthusiasts who have been trained to lead assessments using the Universal Trail Assessment Process (UTAP). A UTAP/HETAP workshop was held in April at the International Trails Symposium in Syracuse, NY, plus five private trainings were held in Alabama, Indiana, Nevada, and Prince Edward Island. Workshops planned for 2020 include a training at the California Trails & Greenways Conference in Modesto, CA (April).

Beneficial Designs provides the UTAP training materials and tools through PaxPress while American Trails coordinates the 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. Data is uploaded to the TrailExplorer Website at www.trailexplorer.org. The Lakeshore Foundation put together a short video explaining the benefits of providing TAI. For more trails-related information contact us at trails@beneficialdesigns.com or visit www.americantrails.org.

Trail Access Information Signage Sample

SmartTool with SmartFeet

The SmartTool™ with SmartFeet is a waterproof, dustproof, and backlit digital level with added feet for a wider stance to reduce the possibility of tipping and imbalances. The SmartTool™ offers objective and detailed slope measurements in degrees, percent slope, and pitch to 0.1 degree of resolution and accuracy. Using a standard 9-volt battery, this inclinometer also features audio sound at both level and plumb.

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 moved to the end of the SmartTool™ 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 also provides a wider base and thus creates 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.

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 & HETAP Workshops). A fully digital HETAP 3 tilt sensor box with improved accuracy and settling time is available on HETAP 3 carts & rolla-wheels. The cart design boasts a stronger 1.0-inch frame, with solid "no-flat" tires and upholstery that provides improved storage and functionality. Contact us for more information at trails@beneficialdesigns.com.

Surface Accessibility

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

Beneficial Designs is now shipping the new Series 100 Rotational Penetrometers (RP). RPs are precision measurement devices that have calibrated, spring-loaded surface indenters to measure firmness and stability. BD has re-engineered the heart of the system to provide an increase in resolution and accuracy of readings for measurement of all surfacing. The Series 100 RP model has increased accuracy and measures with a resolution of 0.0005 inches. Parks, recreation programs, and school systems should use an RP to ensure that the surfaces of their playgrounds are kept in firm and stable condition. When the DOJ published the 2010 ADA Standards for Accessible Design (15 Sept. 2010), the standards expanded to include requirements for playgrounds. The requirements state that ground surfaces shall comply with ASTM F1951 and shall be inspected and maintained regularly and frequently to ensure continued compliance with ASTM F1951. The RP results received when testing playground surfaces correlate with the ASTM F1951 standard, as shown in the peer-reviewed article "Use of Two Test Methods to Ensure Accurate Surface Firmness and Stability Measurements for Accessibility."

The National Center on Accessibility has used the RP to conduct longitudinal studies of various trail and playground surfacing materials to determine how well those surfaces maintain firmness and stability that meets federal requirements. Therefore, an agency can now implement a maintenance schedule using the BD Series 100 RP to verify that required firmness and stability is maintained. For ordering information, please visit our Beneficial Designs website.

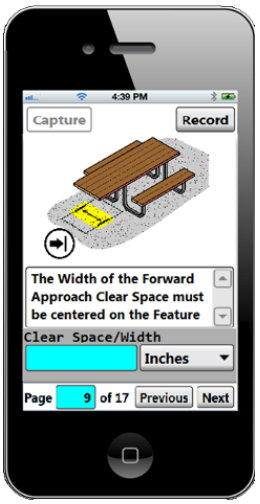
For more information about the RP and outdoor surfaces, please visit the US Access Board Website and review the published research under 1) "Exterior Surfaces" and 2) "Accessible Exterior Surfaces Technical Report" dated 24 April 1999. Peter and Seanna also published a peer-reviewed paper in the journal Disability and Rehabilitation: Assistive Technology: "Use of Two Test Methods to Ensure Accurate Surface Firmness and Stability Measurements for Accessibility." This 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.

A Standardized Assessment Process of Outdoor Recreation Facilities (DORAP)

USDA SBIR Phase I Grant #2008-33610-18906

USDA SBIR Phase II Grant #2013-33610-21051

Since the Accessibility Guidelines for Outdoor Developed Areas (AGODA) became law for Title I entities in September 2014; it is only a matter of time before a similar version is adopted for Title II entities. BD completed a Phase II grant to complete the development of the Developed Outdoor Recreation Assessment Process (DORAP). BD is now funding Phase III to complete commercialization of the process and equipment. This project has created repeatable measurement methods for assessing the accessibility of outdoor constructed features found in outdoor recreation areas such as parks and campgrounds. A precision study of the process was presented at the 2015 RESNA conference.



A process has been developed that uses simple hand tools and paper forms, but an additional suite of tools and a DORAP App (that can be used offline) have been developed to increase the speed and accuracy of the process. Users will be able to assess features such as picnic tables, tent pads, outdoor rinsing showers, grills, and fire rings, etc. DORAP in-person and online training and certification materials were developed.

BD was part of a presentation about assessing the accessibility of outdoor recreation areas, including municipal parks, at the National ADA Symposium in Dallas-Grapevine, TX in June 2019, and will presenting about these assessments again at the ADA Symposium in Kansas City, MO in May 2020.

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 the DORAP App, 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 website.

Nevada Recreation Trails Program & NV State Parks

NVRTP Grant #FY 2008-22, FY 2010-11, & FY2017-13

We have been working with the Nevada Division of State Parks to assess approximately 86 miles of trail and associated trailhead amenities in 4 Nevada State Parks. Now that assessment is completed, we are designing a panel map for each park, a web/printable map for each park, and approximately 110 Trail Access Information (TAI) Strips. Our goal is to continue making TAI widely available in Nevada for a variety of trails and trail users. In previous projects, we have assessed over 200 miles of trail in 26 different park areas. We have installed 73 different panel maps and over 200 TAI signs.

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 systematically measures elements within the pedestrian environment, such as curb ramps, severe cross slopes, trip hazards, 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. In addition to the assessment cart, we have wireless devices to measure tripping hazards and linear measurements of features and sidewalk panels. We offer sidewalk assessment services throughout the US. We continue to assess college campuses and we have been actively seeking opportunities to provide assessment work for other agencies to help them prepare their federally required ADA Transition Plans for the sidewalk environment. In November, Peter and Sam were invited to take part in a charrette evaluating three transportation corridors in the City of Los Angeles. As of December, BD is under contract with the Nevada Department of Transportation to assess newly constructed or rebuilt public right-of-way throughout the state of Nevada. The PROWAP System received national recognition in a profile in the December 2013 issue of Wired magazine and an SBIR success story. BD was part of two presentations (including one on PROWAP assessment and transition plans on college campuses) and had an exhibit at the National ADA Symposium in Dallas-Grapevine in June 2019. For more information visit our Beneficial Designs website.

Airline Travel: Assistive Technology for Non-ambulatory Passengers

PVA Grant #3028

We completed a two-year grant funded by the Paralyzed Veterans of America (PVA) in collaboration with Jessica Presperin-Pedersen, MBA, OTR/L, ATP/SMS; RIC, Chicago, IL. This project focused on issues related to boarding wheelchairs, aircraft seating, transfers, and protection of wheelchairs during travel. BD performed IRB-approved human subject testing of wheelchair users to evaluate existing boarding wheelchairs and aircraft seating to develop seating modifications and design specifications for improved comfort and safety of wheelchair users when traveling. The RESNA Standards Committee on Air Travel was formed as a result of this work.

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

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.

A repeatability and reproducibility study of the color value contrast method in ASTM F3021/F3022 was presented at the 2016 RESNA conference. This color value contrast test method is now being used in other assistive technology standards such cognition and wheelchairs. This set of ASTM standards was highlighted in the ASTM Standardization News publication.

In addition, on April 30, Senator Tammy Duckworth 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. 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.

Last year, the RESNA Standards Committee on Inclusive Fitness (IF) 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. RESNA IF is currently working on two additional sections regarding training and certification for fitness center staff and information disclosure. The committee is actively recruiting experts in these areas. For more information, visit the RESNA IF website.

RESNA IF was highlighted on the NCHPAD website and in the July/August 2016 Access Currents (US Access Board's newsletter).

Accessible Fitness Equipment and Facilities

RERC NIDILRR Grant# 90REGE0002-01-00

We have just started year three of a third five-year RERC RecTech grant with the University of Alabama at Birmingham, which is focusing on implementing the research findings and standards developed in the previous RERC RecTech projects. We are working to identify factors that help and factors that hinder the adoption of universal design principles by exercise and recreational equipment manufacturers and public and private exercise and recreational facilities. We can use these findings to increase interest in universal design and encourage the usage of ASTM and ANSI/RESNA published standards to expand the accessibility of fitness environments for people of all abilities. Currently, interviews of fitness center owners or managers are underway. For participation information, email stephanie@beneficialdesigns.com.

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 completed year five of a second five-year RERC for Advancing Cognitive Technologies (RERC-ACT) through the University of Colorado. This project houses the RESNA Standards Committee on Cognitive Accessibility (CA), whose goal is to develop universal design standards to increase product usability of consumer products. This work was presented at the 2011 RESNA conference. A new version of the ANSI/RESNA Standard for Cognitive Accessibility – Volume 1: Universal Criteria for Reporting the Cognitive Accessibility of Products and Technologies is now published and available on the RESNA CA website. RESNA CA is collaborating on international standards with ISO/TC 173/WG 10 Assistive products for cognitive disabilities. Portions of RESNA CA-1 are being incorporated into a new ISO draft standard. RESNA CA meetings are open to all. Visit www.facebook.com/CognitiveAccessibility for additional information.

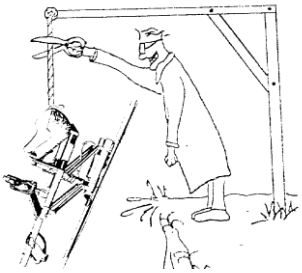
Wheelchair Standards

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.

Air Travel Standards

RESNA & Beneficial Designs

As Chair of the RESNA Standards Committee for Assistive Technology for Air Travel (ATAT), Peter is working closely with representatives from airlines, DOT, FDA, disability groups, and wheelchair manufacturers to draft standards related to air travel for people with impairments. The first volume will focus on specifications for power mobility devices designed for air travel, including information to be given to power mobility device users, manufacturing specifications, and guidelines on information and training for baggage handlers. Power wheelchairs and scooters currently available often sustain significant damage during transit, severely limiting the owner's mobility. Baggage handlers are also at risk of injury due to unknown device weights and lack of secure, labeled lifting points. The draft standard addresses mobility device design, mobility device labeling, mobility device handling procedures, and dissemination of relevant information to people with mobility impairments. Two sections have been completely 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.

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 11 ATS Committees that develop National ATS for the US, while harmonizing where possible with international standards, such as those developed through ISO. RESNA ATS are available for purchase through the RESNA store.

Wheelchair Testing & Design

We continue to provide 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.

Wheelchair Training Guides

PVA Research and Education Foundation

The 2nd Edition of The Manual Wheelchair Training Guide is now available. 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 negotiating 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.

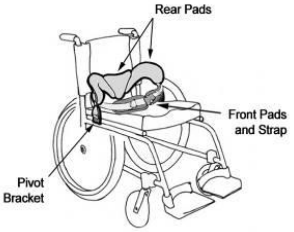
Canoe Seating System

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, 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®

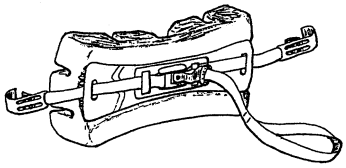
NIH/NICHD SBIR Phase II Grant #2 R44 HD36533-02A2

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. The FlexRim is manufactured by Spinergy and has been commercially available since September of 2007. 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. It will soon be manufactured by BES Rehabilitation, Ltd.



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 Beneficial Designs's expert witness services please contact peter@beneficialdesigns.com.

Special Thanks & Acknowledgments

Past Employees and Consultants

- **Allison Ansel**, Office Assistant, is finishing her studies and pursuing internships in international business.
- **Seanna Kringen**, Research Coordinator, passed away in April 2019 and is greatly missed by everyone.
- **Jo Anne Snarr**, Bookkeeper, retired and is enjoying time with her grandchildren.
- **Hannah Wetmore**, Office Assistant, is now pursuing her goal of becoming a dental hygienist.

Funding Agencies and other Acronyms:

CSA	Canadian Standards Association
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
NIH	National Institutes of Health
NVRTP	Nevada Recreational Trails Program
PTBA	Professional Trail Builders Association
PVA	Paralyzed Veterans of America Research and Education Program
RERC	Rehabilitation Engineering Research Centers
RESNA	Rehabilitation Engineering and Assistive Technology Society of North America
RIC	Rehab Institute of Chicago
SBIR	Small Business Innovation Research
USDA	United States Department of Agriculture

Beneficial Designs Staff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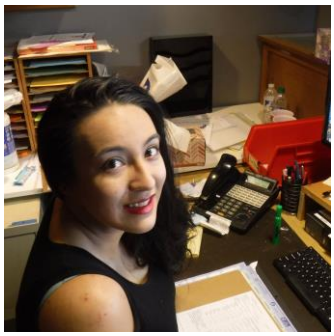
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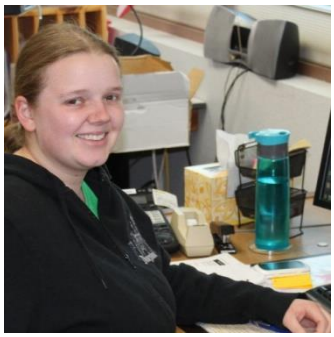
Sharon Vazquez