

## Dear Friends and Supporters,

Another great year has come to a close. Everyone at Beneficial Designs (BD), has been busy with research projects, standards development, sidewalk and trail assessments, and wheelchair testing. We are also continuing to do presentations and work collaboratively with students to develop improved technology and inspire the future towards engineering and accessibility.

A new item that we have developed is the Manual Efficient Trail Assessment Process system (METAP). This is a device similar to the High-Efficiency Trail Assessment Process (HETAP) cart, with fewer electronics. METAP enables the acquisition of an assessment cart or roll-a-wheel at a lower cost to perform assessment work. It requires manually entering the grade, cross-slope, and distance but brings down the equipment cost.

We have been working with US air carriers, wheelchair manufactures, and disability groups to standardize how mobility devices should be handled during air travel. Every year, thousands of wheelchairs are damaged during air travel. Each time damage occurs, a passenger's travel plans become a nightmare. As the next section of the standard goes through final review and publication, we hope this will reduce damage to mobility devices and make the air travel process more efficient.



One exciting trip Peter was able to take this year was to the Greenway Collaborative Reunion at the Grand Canyon. This was a get together to celebrate the culmination of over 20 years of work after planning about 22 miles of trails and shared use pathways along the south and north rims of the Grand Canyon. The new trails allow Canyon visitors to leave their cars behind and walk, wheel, or bike for miles. On November 17, 2023, Peter wrote his first ever [Facebook](#) post on the Grand Canyon Hikers group, which generated over 40,000 responses and 2,600 comments, including requests from journalists and film makers wanting interviews about the project. Emma Brocato of the Las Vegas Suns news wrote [this article](#) after seeing the [Facebook](#) post.

Beneficial Designs also received some positive recognition when the PBS show *Wild Nevada* decided to do a segment on accessibility and what BD is accomplishing for outdoor recreation enthusiasts. The show titled "[Access for All](#)" premiered on January 4, 2024. Additionally, the hosts of the show were the Grand Marshals of the Nevada Day Parade, and even mentioned doing the segment about BD to the Carson City Newspaper in the [Nevada Appeal](#).

This year we have hired several new employees to continue with our sidewalk and rest area assessments. These new technicians have already successfully completed the first year of a NDOT rest area assessment contract and are ahead of schedule on the sidewalk assessment contract, having already completed assessment of Carson City and the majority of Reno sidewalks, including the McCarren Loop.

**Thank you for your continued interest in our work. We wish you the very best for 2024!**

# Projects

## Wheelchair Testing & Design

As a primary area of work, BD is now accredited as an ISO 17025 test lab by ANAB to provide confidential wheelchair testing for the manual and powered-wheelchair industry. This includes the following national and international standards: RESNA WC-1, WC-2, and WC-3; ISO 7176; ISO 16840; PDAC; EN 12183 and EN 12184. Standardized test procedures are used to verify that mobility devices are safe for the end user. BD has helped dozens of manufacturers improve their products to meet and exceed the minimum requirements.

For more test information and to view BD's accredited scope of services please visit [www.beneficialdesigns.com](http://www.beneficialdesigns.com) or contact [mail@beneficialdesigns.com](mailto:mail@beneficialdesigns.com).

## Public Right-of-Way Assessment Process (PROWAP) to Determine Accessibility

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

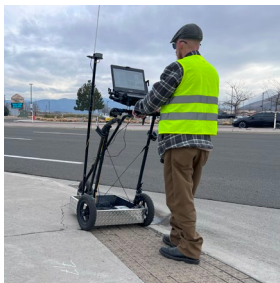


Beneficial Designs developed the semi-automated Public Right-of-Way Assessment Process (PROWAP) that enables assessment coordinators to systematically identify problematic elements within the pedestrian environment, such as steep curb ramps, severe cross slopes, vertical discontinuities (tripping hazards), 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. 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 and continue to assess college campuses, metro stations, rest stops, and all aspects of public sidewalks. On August 8<sup>th</sup>, the US Access Board issued the final rule for the Public Right-of-Way Accessibility Guidelines (PROWAG). Now that the guidelines are about to become law, PROWAP will be needed more than ever. The PROWAP System received national recognition in a profile in Wired magazine and an [SBIR success story](#). For more information, explore our [sidewalk assessment web pages](#).

## ADA Assessment of Nevada DOT Public Rights-of-Way

NDOT 239-20-052



At the end of June 2023, Beneficial Designs was granted a project extension to continue assessing Nevada DOT public rights-of-way. Peter was able to meet governor Lombardo at the NDOT board meeting and thank him for his support to increase the accessibility of sidewalks in Nevada. With the project extension came an updated assessment process, in which technicians are now operating both the PROWAP system and an NDOT ArcGIS Field Maps app to collect more detailed sidewalk data. The updated process now includes stroll (line) data, allowing NDOT to analyze and map sidewalks across Nevada. Our technicians use the app to

objectively measure and collect feature points for curb ramps, residential driveways, pedestrian push buttons, rectangular rapid flashing beacons (RRFB), missing sidewalk, narrow access points, and various types of discontinuities, which represent potential hazards to pedestrians and include tripping hazards, steep cross slopes, openings, drop offs, and protruding objects. The assessment data is uploaded to the NDOT geodatabase where further analysis occurs. The assessment technicians have completed significant amounts of sidewalk assessment in Las Vegas and Reno, including the entire McCarran Boulevard Loop.

After the PROWAG final rule was published, Beneficial Designs combed the new guidelines and updated the assessment process to reflect the changes. Sidewalk and curb ramp reference guides were updated to

visualize and explain the new requirements. Juliet Shoultz, a US Access Board Transportation Systems Engineer and Accessibility Specialist, and the lead public spokesperson for the PROWAG final rule, assisted Beneficial Designs in developing the reference guides, which are now being used by NDOT.

## ADA Assessment of Nevada DOT Rest Areas

NDOT 109-22-052



In October of 2022, Beneficial Designs was awarded a contract with NDOT to conduct ADA self-evaluations for all rest area facilities across the state of Nevada. Assessments will be performed on features and paths of travel at each rest area using the Rest-Stop Assessment Process (RSAP), which uses PROWAP software and hardware. To assist NDOT in the management, prioritization, and improvement of rest areas, and to provide access information to the public, a comprehensive facility report and geodatabase will be provided to NDOT for each rest area facility. Beneficial Designs will also update the NDOT Transition Plan. Beneficial Designs is

now in the second year of the project and has assessed half of the active rest areas in Nevada, with additional rest area assessments in progress.

## Surface Accessibility/Surface Testing

ASTM F1951-21 Testing

Beneficial Designs is ISO 17025 accredited by ANAB to perform ASTM F1951- 21 “Standard Specification for Determination of Accessibility of Surface Systems Under and Around Playground Equipment”. The standard uses the “Wheelchair Work Test Method” to compare the work required to propel and turn on any type of surfacing versus the work required to propel and turn on a 7.1% slope ramp. If it requires less work to propel and turn on a test surface than the 7.1% slope ramp, then the test surface passes the test. BD has tested playground, sport, and trail surfaces, including engineered wood fiber, artificial turf, and all kinds of outdoor surface stabilization systems. Beneficial Designs normally performs this testing at our accredited test lab, where the ISI RP is also used to measure the surface at the same time of testing. This enables surface manufacturers to use the ISI RP to verify their surface installations in the field and over time.

For more test information and to view BD’s accredited scope of services please visit [www.beneficialdesigns.com](http://www.beneficialdesigns.com) or contact [mail@beneficialdesigns.com](mailto:mail@beneficialdesigns.com)

## Surface Accessibility/Rotational Penetrometer

NIH/NICHHD 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 uses a calibrated spring and indenter to measure with a resolution of 0.0005 inches. BD is now ISO 17025 accredited as a certified calibration laboratory by ANAB to calibrate the BD RP ISI. Parks, municipalities and school systems use this technology to ensure that the surfaces on their trails, access routes and playgrounds 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 playground 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 of 2020 between the US government and the Iowa City Community School District under the ADA. The BD RP ISI was used to objectively assess the 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](#).

Beneficial Designs regularly performs laboratory and field testing of surfaces using the RP ISI and ASTM F1951. For ordering or testing information, please visit our [website](#) or contact us at [surfaces@beneficialdesigns.com](mailto:surfaces@beneficialdesigns.com).

## SmartTool™ with Smart Feet



The SmartTool™ offers objective and detailed slope measurements in degrees, percent slope, and pitch to 0.1 degrees of resolution and 0.2 degrees of 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 rolling or walking across a path of travel. One of the two feet is wider, creating three points of contact. A strap is also included, enabling easy measurement without the need to bend over. Contact us for more information at [trails@beneficialdesigns.com](mailto: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



2023 was another successful year for our HETAP program, with four new trainings. Three of these were in sponsorship with Move United and happened at the Delaware Water Gap State Recreation Area, Grand Canyon National Park, and Fort Collins, Colorado. Additionally, there was a training in Nashville, Tennessee with Tennessee State Parks. We also presented at the International Trails Summit in Reno, Nevada and at the Oregon Trails Conference in Coos Bay, Oregon.

Currently, over 1900 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 UTAP/HETAP training materials and tools through PaxPress, while American Trails coordinates training courses. The HETAP 2.5 or 3 software and TrailWare 2.0 can be used to generate Trail Access Information, signage, and trail management reports.



**Tahoe Rim Trail**  
to Tahoe Meadows

|                |                      |
|----------------|----------------------|
| Length         | 21.8 mi (35.1 km)    |
| Elevation Gain | 2894.3 ft (882.2 m)  |
| Elevation Loss | 5528.0 ft (1684.9 m) |

**YOU ARE HERE**

Latitude 39° 6' 15.93" N  
Longitude 119° 53' 49.00" W

**TRAIL USE**

- Hikers
- Dogs on Leash
- Equestrians
- Mountain Bikes
- No Motor Vehicles

**GRADE**

|                     |            |
|---------------------|------------|
| Typical Grade       | 7.3%       |
| 23% of trail is     | 9% to 14%  |
| 2.4 mi (3.9 km) is  | 14% to 29% |
| Standard Ramp Grade | 8.3%       |

**CROSS SLOPE**

|                      |            |
|----------------------|------------|
| Typical Cross Slope  | 3.2%       |
| 18% of trail is      | 5% to 10%  |
| 2433 ft (741.6 m) is | 10% to 20% |

**TREAD WIDTH**

|                    |                 |
|--------------------|-----------------|
| Typical Width      | 28 in (70.7 cm) |
| Minimum Width      | 18 in (45.7 cm) |
| 1.4 mi (2.3 km) is | 18 in (45.7 cm) |

**SURFACE**

| Surface Type      | Soil              |
|-------------------|-------------------|
| Typical Firmness  | 0.17 in (F)       |
| 1% of trail is    | Moderately Firm   |
| Minimum Firmness  | 0.40 in (MF)      |
| Typical Stability | 0.51 in (MS)      |
| Minimum Stability | 0.73 in (MS)      |
| 25% of trail is   | Moderately Stable |

**OBSTRUCTIONS**

No Obstructions

WARNING: Trail conditions may have changed since August 2017 when this trail last was assessed. Temporary trail obstructions were not recorded. Obstructions less than 2 in (5.1 cm) or outside of the tread area (96 in (244 cm) wide by 120 in (304.8 cm) high) were not reported. LT-41-2020-08-17

Signage created by Beneficial Designs Inc. using Trail Access Information data collected by a certified trail assessment coordinator. Funded by the Nevada Department of Conservation and Natural Resources.

**TAHOE RIM TRAIL**

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 at the same time, 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 US and Canada by private entities, state and city land managers, and the National Park Service.



BD has provided trail assessment and mapping services for local, state, and federal government entities in several states. This includes almost 500 miles of assessed trail in over 50 Nevada State Parks, including nearly 400 TAI SignPosts and over 100 panel maps. At the end of 2022, three large trail access information (TAI) maps, dozens of TAI SignPosts, and GIS files were finished and delivered for three parks in King County, Washington. 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](mailto:trails@beneficialdesigns.com), or visit [www.americantrails.org](http://www.americantrails.org).

## Digital Tread Squared (DT<sup>2</sup>)



With two SmartTool levels attached perpendicular to one another on an assessment wheel, BD's Digital Tread Squared (DT<sup>2</sup>) 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<sup>2</sup> is now available for purchase to use in trail, accessible 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](#).

## 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 & 90REGE0019



We are working with the University of Alabama at Birmingham on a Rehabilitation Engineering Research grant to complete a harmonized set of International ASTM Standards on universal design specifications for mainstream accessible fitness equipment and RESNA American National Standards on Inclusive Fitness Environments. 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](http://www.astm.org).

In 2020, 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 three additional sections regarding policies, information disclosure, and training and certification for fitness center staff as well as best practices

regarding what needs to be taught in college curriculums for inclusive fitness. 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

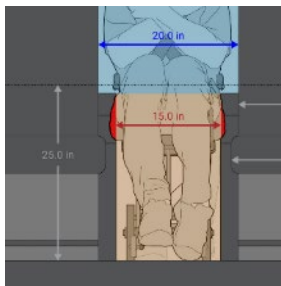
RERC NIDILRR Grant #90RE5019-01-00

We have completed two five-year RERCs 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 the usability of consumer products. The RESNA CA committee is currently drafting a section about labeling consumer products with objective information indicating the product's cognitive accessibility.

As chair of RESNA CA, Stephanie played 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 were incorporated into ISO 21801-2:2021 Cognitive accessibility—Part 2: Reporting. [RESNA CA](#) meetings are open to all. For additional information, visit [www.facebook.com/CognitiveAccessibility](http://www.facebook.com/CognitiveAccessibility).

## Air Travel Standards

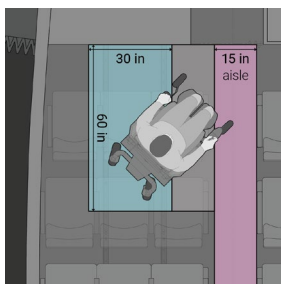
RESNA & Beneficial Designs



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 and Heather Ansley presented at the PVA Summit in August of 2022 on solutions to address air travel for non-ambulatory wheelchair users. Peter also 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

wheelchairs being damaged, standardize the handling procedures for stowage of assistive technology on aircraft, and streamline the information-gathering process for passengers who use mobility devices. Section 4 of the standard contains design standards for wheelchairs that are less likely to be damaged during air travel and was published in September of 2021. Section 3 is in the final review stage and covers procedures for handling mobility devices. For more information visit the [RESNA ATAT](#) website.

Peter participated as a member of the IATA Mobility Aids Action Group (MAAG) that published the [IATA Guidance on the Transport of Mobility Aids in February of 2023](#). Peter presented at the International Air Transport Association IATA World Passenger Symposium in November of 2022 on “What you need to know and do to prevent damage to mobility aids.”



Peter participated on a committee for a Study on the Feasibility of Wheelchair Restraint Systems in Passenger Aircraft that published a preliminary assessment on the [Technical Feasibility of a Wheelchair Securement Concept for Airline Travel](#), a consensus report of the National Academies of Sciences, Engineering and Medicine that was published and presented to congress in 2021. Crash testing of powered wheelchairs is currently underway related to this work.

BD created a graphics template to enable wheelchair manufacturers to create [air travel configuration cards](#) that will assist air carriers to prepare mobility devices for air travel. The RESNA Wheelchair standards committee has balloted and approved the requirement for all new wheelchairs to be provided with air travel configuration cards. This ballot is going through a final revision process.

Beneficial Designs has also been working to develop a process by which air travel configuration cards can be created for existing wheelchair users. A form was developed to gather all necessary information for the development of a customized card. Methods of implementation are being explored.



Beneficial Designs has been working with PVA to help improve air travel for passengers using mobility devices. Due to short cargo hold doors on some commercial aircraft, powered mobility devices that do not sufficiently reduce in height must be tipped on their side to fit into the cargo hold. Such a practice can damage the drive wheel as many powered mobility devices are extremely heavy. In order to reduce the likelihood of damage to wheelchairs when tipped on their side, BD developed the DrivePad concept, a simple pad that can be attached with touch fasteners to the drive wheel on a powered wheelchair. The pad concentrates the load to reduce the bending movement on the drive wheel. Preliminary test results have shown that the DrivePad can prevent damage when a wheelchair is tipped on its side.

## 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. Beneficial Designs 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 included 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 who are prone to seizures. The committee is looking at restraints for sit-skis that are adjustable that can be used by instructors to prevent a sit-skier from sliding forward off of a chairlift. The committee meets each year in December, in conjunction with the Ski Spectacular event in Breckenridge, Colorado. For more

information, please visit the [RESNA ASE](#) website. Members of the committee are collaborating with the ANSI B77 Aerial Tramway Standards committee to develop specifications for a Universal Access Chairlift to use with newer chairlifts that have access issues. Peter is also a member of the ANSI B77 where he is cochair of the ADA Ad-Hoc Committee advocating for accessibility of ski lifts.

## Wheelchair Training Guides

PVA Research and Education Foundation

The 2<sup>nd</sup> edition of *The Manual Wheelchair Training Guide*, *The Powered Wheelchair Training Guide*, and *A Guide to Wheelchair Selection* provides 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 and electronic editions are available directly through PaxPress, a division of Beneficial Designs. PaxPress is also distributing the books electronically through Amazon and Nook. Contact [paxpress@beneficialdesigns.com](mailto: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—now sold as a Universal Paddling Seat/Basic 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](#).

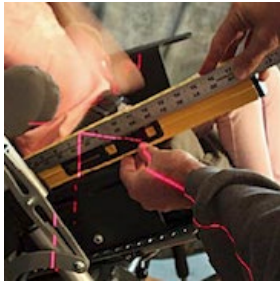


### PaxBac

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 back 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 claims based on evidence found in testing. Peter has been an expert witness 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](mailto:peter@beneficialdesigns.com).

## Special Thanks & Acknowledgments

### Funding Agencies and Other Acronyms

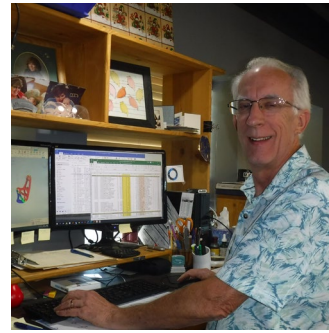
|         |                                                                                   |
|---------|-----------------------------------------------------------------------------------|
| ANAB    | ANSI National Accreditation Board                                                 |
| DOT     | Department of Transportation                                                      |
| HETAP   | High Efficiency Trail Assessment Process                                          |
| ISO     | International Organization for Standardization                                    |
| METAP   | Manually Efficient Trail Assessment Process                                       |
| NAS     | National Academy of Science                                                       |
| NDOT    | Nevada Department of Transportation                                               |
| 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                                           |



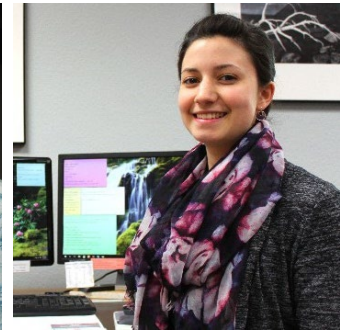
Peter Axelson



Ria Axelson



Bill Blythe



Maegan Elkaraki



Debbie Hester



Ben Hubbard



Travis McDonald



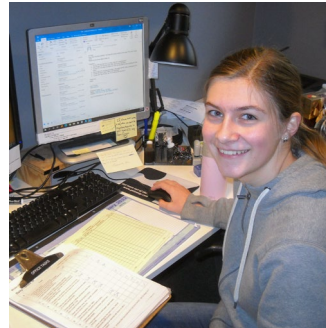
Stephen Pieters



Paul Schnorbus



Wynter Sturtevant



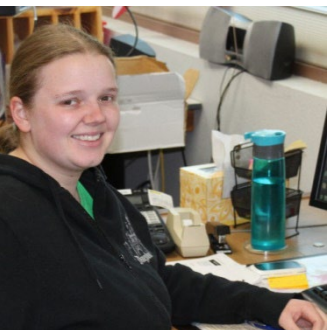
Julia Woodruff



Stephanie Stephens



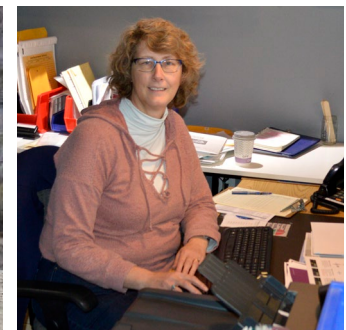
Paola Vazquez



Sharon Vazquez



Todd Ackerman



Annabeth Johnson



Jackson Palmer



Thomas Lee



Joshua Wetmore



Abraham Lesiuk



Sam Finley



Jeremey Kennemur

## Staff

### **Peter Axelson**

Founder and Director of R&D, presents our work worldwide. He loves spending time with his daughter Ria, skiing and flying light aircraft.

### **Ria Axelson**

Office Manager and bookkeeping assistant, enjoys welding, playing volleyball, spending time with her friends, and working toward her nursing degree.

### **Maegan Elkaraki**

Bookkeeper through March of 2023, who trained Sharon and Ria and is now homeschooling her children full time, she enjoys spending time with her husband and children, and enjoys a good book and playing the piano.

### **Sam Finley**

Sidewalk Assessment Technician, enjoys card games and bike riding.

### **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 and Project Manager, enjoys time with his wife and children, painting, reading, learning, and hiking.

### **Annabeth Johnson**

Office Assistant, enjoys spending time with her husband and children, reading, and road trips with her family.

### **Jeremy Kennemur**

Assessment Technician, husband and father of three boys. Loves writing and recording music, playing guitar, bass, and drums.

### **Thomas Lee**

IT & Management assistant, loves working on and building ecommerce websites. Father to two boys 5 & 9. Enjoys spending time with family and watching football, basketball, and baseball.

### **Travis McDonald**

Assessment Technician and Compliance checker, enjoys backpacking, reading, puzzles, indoor rock climbing, running, ceramics, and music.

### **Abraham Lesiuk**

Sidewalk Assessment Technician, loves spending time with his boys, DIY projects, camping, hiking, kayaking, and playing guitar.

|                              |                                                                                                                                                                                                                                                                  |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Jackson Palmer</b>        | Shop Assistant and Assistant Technician, loves to hang out with family and pets, watching shows, spending time with friends, and parkour.                                                                                                                        |
| <b>Stephen Pieters</b>       | Testing Supervisor and Sidewalk Assessment Coordinator, enjoys spending time with his children, problem solving, riding motorcycles, fishing, and hunting.                                                                                                       |
| <b>Paul Schnorbus</b>        | Machinist, likes Legos, machining, target shooting, camping, and a well-told story.                                                                                                                                                                              |
| <b>Stephanie Stephens</b>    | Quality Manager, lives in India with her husband, where she continues to work for Beneficial Designs, is learning to cook amazing food, and is attempting to drive in a city <a href="#">that is consistently in the top 10 for worst traffic in the world</a> . |
| <b>Wynter Sturtevant III</b> | <b>Research</b> Assistant, when he is not working he is writing, spending time with family, and preaching at his church.                                                                                                                                         |
| <b>Paola Vazquez</b>         | Office Assistant, attends WNC and enjoys being with family, jogging, and working with children.                                                                                                                                                                  |
| <b>Joshua Wetmore</b>        | Shop Assistant and Assistant, loves to spend time with his family, play board games, and print structures with his 3D printer                                                                                                                                    |
| <b>Julia Woodruff</b>        | Office Assistant, enjoys reading, writing, playing the piano, and spending time with family and friends.                                                                                                                                                         |
| <b>Sharon Vazquez</b>        | Bookkeeper, enjoys spending time with family and friends, reading, and music.                                                                                                                                                                                    |

## Consultants

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|-----------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Todd Ackerman</b>  | Trail and Sidewalk Assessment Coordinator, leads trail and sidewalk assessments and enjoys outdoor activities, traveling and teaching the trail assessment process. |
| <b>Bill Blythe</b>    | Facility Manager, enjoys spending time with his wife; likes to cook, play guitar, and work with computers; and is the IT manager at his church.                     |
| <b>Martin Clemons</b> | Electrical Engineer, designed the HETAP 3 electronics and firmware and is the lead engineer to assess outdoor recreation trails.                                    |
| <b>Tip Ray</b>        | Trail Assessment Coordinator, helps with trail trainings and assessments.                                                                                           |
| <b>Nathan Tolbert</b> | Sidewalk Assessment Trainer and Project Coordinator, loves hiking, fishing, and camping with his wife and sons, and enjoys coaching a variety of sports.            |

## Board Members

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|----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Chris Lynskey</b> | 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. |
| <b>Kent Nelson</b>   | 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.                        |