

The Mountain Trike is an all-terrain wheelchair with fully independent suspension which is targeted between standard and the more extreme, off road specific wheelchairs. The product is target towards those with spinal column injuries and with the aim of giving the user more independence and freedom to explore the outdoors while maintaining some everyday practicality such as fitting in a disabled toilet.

After market research and user studies, the improvements I made to the existing design were:

- The addition of a derailleur based gear system offering 3 gears.
 - By utilising proven mountain bike parts it was ensured that the system was durable, low cost and easy to maintain or replace parts if needed.
 - A single trigger shifter operates both sets of gears (one on each wheel) to improve the ease of operation via a geared cable splitter which reduces the force requirements of the user for an inclusive design.
 - As the chain is continually fed when cruising, gear changes occur smoothly in-between pushes.
 - Using a Sprag clutch design, the chair will not roll backwards when going uphill, giving improved safety and allowing you to easily stop for a rest.
 - Gear adjustments are accessible when seated.
- Quick release wheels for improved ease of transportation.
 - Removal of a single bolt which is then retained in the hub to prevent loss.
 - Addition of a bash guard to protect the gears and disk brakes during transit.
- Improved axle layout to ensure the gears and disk brake are easily accessible for maintenance.

The Trike is designed to help the user maintain a level of independence they are accustom too prior to their injury. Feedback from current users have highlighted these areas:

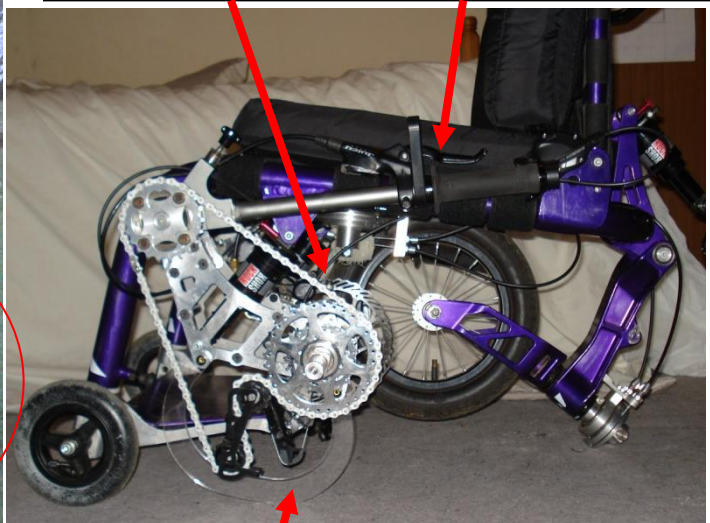
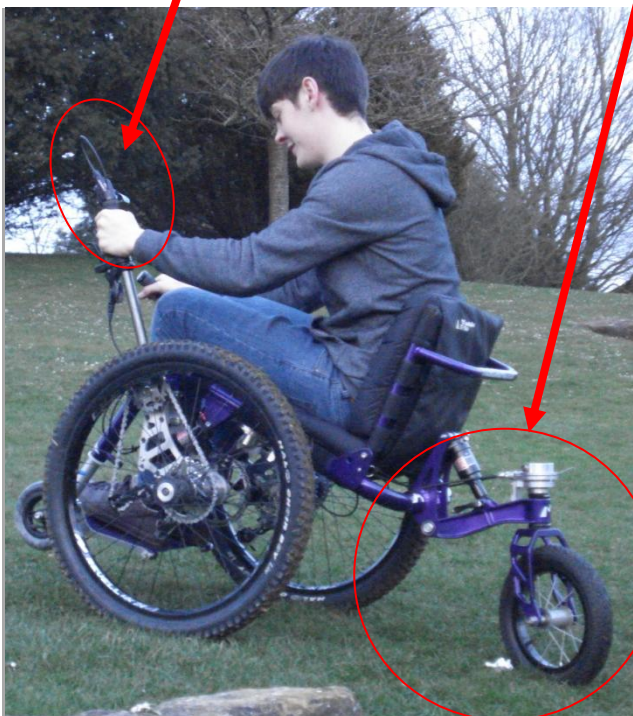
- Being able to attend BBQ's, picnics, walk the dog or go to the park with the kids.
- Simply not needing assistance when on grass, removing self-consciousness at events.
- Being able to exercise in the outdoors, tackling challenges similar to mountain bikes.
- Able to go up kerbs, over sand, gravel and deep mud while being completely stable.

The features of the design are illustrated below.

Gear changes are performed using a standard mountain bike trigger shifter.

Steering is performed using a 'joystick' using your right hand which steers the rear wheel like a rudder.

A powerful disk brake is on each wheel. These are operated using a single brake lever to give even braking and easier operation. A simple and patented handbrake mechanism is also incorporated.



With the wheels removed and the rear wheel folded up, the bash guard protects the gears and disk brakes during transport.