**Introduction**

Imagine living in a place where daily household tasks, such as fetching clean water, require you to travel miles on foot. Now imagine living this life with a mobility impairment. Your mobility would be slow and difficult, likely limited to crawling on hands and knees, and your household contributions would be restricted. For the physically impaired living in Mahadaga, Burkina Faso, this picture of life is a very real one.

The Mobility Tricycle Project originated in 1999 with a hand powered tricycle design for people with limited mobility in Mahadaga, Burkina Faso. In 2004 there was a special request for a tricycle that required much less demand on the upper body than the hand powered tricycle and thus the electric version of the tricycle was born. The Mobility Tricycle Project is now working to improve and fine tune the current hand powered and electric tricycle models. Our goal is to produce designs that are simple, cost-effective, and locally sustainable in Burkina Faso.

The rear axle and frame redesign team focuses on the frame of the tricycle, including the rear axle supports, wheels, foot rest, seat and controls.

**The Problem**

The existing tricycle frame was too wide to fit through most doorways in Burkina Faso. To remedy this problem, the wheels were moved in closer to the frame to reduce the overall width of the tricycle. As an unintended consequence of this modification, interference occurred between the right wheel and the control boxes. New positions for the control boxes needed to be identified to make this design viable.

**Results**

- We moved the joystick box forward to improve access for a trike user. Instead of having to reach their arm back in an awkward fashion, there is now more room for the user to brake by pulling back on the joystick.
- We shifted the FWD/REV switch box upwards so that using the switch does not interfere with the position of the joystick.
- Additions and modifications to control box mounts had to be made to accommodate the new control locations.
  - Vertical control mount bars were created to support the raised forward/reverse box, and the horizontal bars were extended with the joystick box.
  - The new mounts are versatile — boxes can be mounted at any point along them depending on the preference of the client.
- To clear the interference with the wheel while keeping all controls easily accessible to the user, the power switch box had to be moved to the left side of the seat.
- Mounting bars were added to the left side of the seat for the power switch box.

**Conclusions**

The new position of the tricycle control boxes effectively eliminates the interference with the wheels, and also improves the overall accessibility of tricycle controls. Furthermore, these new positions are reasonably flexible and can be adjusted depending on an individual client’s needs.

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**Further Information**

For more information about the Mobility Tricycle Project as well as other Collaboratory projects, please visit: [http://www.messiah.edu/info/22005/collab_internal](http://www.messiah.edu/info/22005/collab_internal)