# tricycle ergonomics

## improving steering and propulsion

### purpose

Current hand tricycles in developing countries are unwieldy and difficult to manuver, especially over inclined terrain. Our goal was to create a system that allows flexible switching between multiple gears, thus increasing power efficiency of movement over varied ground conditions. The design also required low cost, locally available materials.

### adjusted gear ratios

A major problem with current hand-tricycles is untuned gears that are often too high, making it very difficult for users to ride efficiently even over ideal terrain. Our tricycle utilizes a pair of lower gear ratios that allows riders to travel more comfortably.

### shifting without derailleurs

Current derailleurs on hand-tricycles are poorly manufactured and often break after several weeks of usage, leaving users unable to shift between gears. We developed a system that enables shifting without a derailleur: one only has to reverse the direction of pedaling to change between the two forward gear ratios.

### reverse with steering

The current steering column is difficult to control and offers a limited range of motion that does not permit reverse motion. Our design includes a steering column with a 270 degree range of motion that allows users to easily propel in reverse.

### future plans and applications

Our prototype will be presented to tricycle manufacturers and current users in Africa for feedback and further improvement. The hope is for manufacturers to incorporate our ideas into their own products in a way that will best suit their customers' needs.

### team

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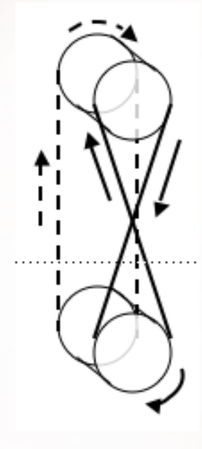

### how it works

When pedaling forwards, the figure eight ratchets and you drive normally. When pedaling backwards, the normal chain ratchets at the bottom and the figure eight drives forwards.