

CHALLENGE

The project aims to satisfy the mobility needs of the disabled in developing countries.

How does it work: The Leveraged Freedom Chair utilizes a simple lever drivetrain that allows the rider effectively “change gears” by changing their hand positions on the propulsion levers. Grabbing the bottom of the levers allows the rider to move the chair at high speed. Grabbing the top of the levers gives the rider additional leverage, making it easier to navigate difficult terrain. The levers can be removed to allow the chair to be used as a standard wheelchair indoors.

Our Story: The Leveraged Freedom Chair (LFC) was designed to satisfy the mobility needs of the disabled in developing countries. It allows users to efficiently travel over long distances and rough terrain, and then use the same mobility device indoors at their destination. Users can change their effective gear ratio by changing their hand position on the propulsion levers. The LFC was designed to use the simplest bicycle components, allowing it to be manufactured and repaired anywhere in the world.

The first prototypes were constructed in Kenya, Tanzania, and Vietnam during the summer of 2008. After a year of refinement and redesign, an extended trial was conducted in Kenya, Tanzania, and Uganda during the summer and fall of 2009. The latest prototype is the result of recent collaboration with the Transitions Foundation of Guatemala, where the chair was further refined for usability and ease of manufacture. A pre-production clinical trial of the design and manufacturing process will take place in India this fall through a partnership with Jaipur Foot, the MIT-Singapore Alliance, and the India Institute of Technology.

LEVERAGED FREEDOM CHAIR

Designers: MIT Mobility Lab

Manufacturers: Transitions Foundation of Guatemala
Transitions Foundation of Guatemala, Association for the Physically Disabled of Kenya, MIT-Singapore, Alliance, Jaipur Foot, Whirlwind Wheelchairs International, Mobility Appliances by Disabled Women Entrepreneurs in Uganda, Kilimanjaro Association for the

Contributors: Spinally Injured, Design Continuum

Sector: Mobility

When: Spring 2008 - present

Guatemala, Kenya, Tanzania, Uganda, Vietnam

Cost: \$200 USD per wheelchair

Completed extended trial - East Africa
Preparing for an extended pre-production trial - India

Status: pre-production trial - India

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FYI: mlab.mit.edu/lfc.php

