

## Description

An easy-to-engage, hands-on braking system was designed to enable manual wheelchair (WC) users to decelerate safely and easily. Braking can be a challenging task, especially for those with limited mobility/dexterity or when braking downhill. The system uses an in-hub brake that is engaged through the push rims.

## Background

To slow down, a WC user will apply friction to the push-rim or wheel with either a bare or gloved hand. This technique works well on level surfaces but can prove ineffective or even dangerous on sloped surfaces. There are a few options available in market that allow the user to apply braking forces through external mechanical measures, but these require the user to remove his/her hands from the push-rim to engage the brake.



## Features of the System

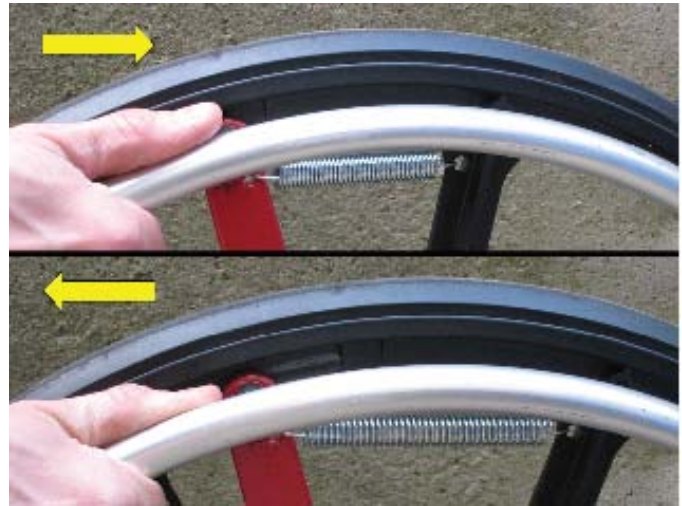
- A system that allows manual wheelchair users to slow down without releasing the push rims.
- Usable by people with low grip strength and dexterity
- Low Cost: cost of materials approximately \$75.00
- Maintains quick release wheel functionality
- Does not increase wheelchair width
- No impact on normal operation and propulsion of the wheel
- Provides consistent and repeatable operation

## Usability

Five wheelchair users with varying function tested the final prototype. The users performed a series of deceleration maneuvers on a sloped surface: short, quick stops; long, controlled braking; and zigzags. Several users also popped and maintained wheelies on steeper descents. Users reported positive experiences during the tests, being able to quickly and easily maintain speed, slow down, and stop.

Video:

[http://www.youtube.com/watch?v=g5F\\_IXYcm7U](http://www.youtube.com/watch?v=g5F_IXYcm7U)



Brake is engaged by rotating pushrim rearward



In-hub brake mounted into wheel



Complete in-hub brake assembly

## Contact

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