

Senior Design Project – Goodwill Industry Transit Cart

A senior design project during the 2004-2005 academic year included the design, construction, and testing of an improved cart for use by Goodwill Industries to sort and transport donated goods. The student team gathered data and information on the use of the current transit carts from Goodwill employees. Students used finite element analysis and the engineering design process to put together several different design variations to improve the carts performance. They constructed the most promising variations as parts of two full-scale test carts, which were used for an ergonomics study with a focus group. The carts were also tested at the Goodwill Industry worksite. Test data and suggestions for improvement were documented, a cost estimate for building the carts was completed, and a final recommendation on the best transit cart design was made to Goodwill Industry personnel and other college visitors as part of the Senior Engineering Design Projects presentation day held at Western Michigan University in April 2005. The two test carts constructed by the students are currently being used at Goodwill Industries, and Goodwill Industry is studying whether to modify their existing transit carts to incorporate the new features that were recommended.



Final Assembly of Transit Cart



Transit Cart Fabrication





Ergonomics Testing for Ease of Reaching Items in the Redesigned Transit Cart