

High-speed hand dryers are six times cleaner, produce 42 percent less CO₂ than paper towel dispensers

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Students use a blow torch and cotton swabs to collect bacteria samples from a paper-towel dispenser.

(Phys.org) —Don't touch that paper towel! High-speed hand dryers are cleaner, more environmentally friendly and save a bundle over time.

This is what some UB students discovered when they studied the

economic, environmental and [social impact](#) of paper towels and Dyson Airblades in campus bathrooms.

Equipped with blow torches and cotton swabs to collect bacteria samples, the students found that six times more bacteria grew on paper-towel dispenser push-and-crank handles than on the Airblades.

And through the life cycle of each product, the Airblades produced 42 percent less carbon dioxide and cost under \$28 per year in energy consumption, compared to paper towels, which cost more than \$900 per year.

With help from James Jensen and Berat Haznedaroglu, professor and assistant professor, respectively, in the Department of Civil, Structural and Environmental Engineering, the research team was awarded second place in the 2014 New York State Pollution Prevention Institute's R&D Student Competition.

The contest funds the students and provides them with the chance to design solutions to real-world environmental challenges.

"These outstanding students represent the best of UB: engaged, thoughtful and enthusiastic students devoted to making the world a better place for others," says Jensen.

For the study, the students examined four high-traffic and low-traffic men and women's bathrooms with Airblades and paper-towels dispensers in two North Campus academic buildings.

Using life-cycle assessment software, the group examined the manufacture, use and disposal of each product. The students measured paper-towel consumption, and used the Airblade's power meter to track the number of users and energy consumed.

Although the Airblade is more expensive up front—with a \$4,000 unit price—the hand dryer has a four-and-a-half year payback period, the researchers say.

Bacteria were collected from several surfaces in the bathrooms as well. While the paper-towel dispensers contained large amounts of bacteria, hardly any organisms were found on the towels themselves.

Results also showed that few bacteria colonies grew on door handles and light switches, says student researcher Cassidy Edwards, a recent environmental engineering graduate.

Through a survey of bathroom users in one of the buildings, the students discovered that 65 percent of people opted for paper towels, spurning the Airblade despite its superior cleaning power.

"People in general think hand dryers are dirty," explains student researcher Alanna Olear, a senior [environmental engineering](#) major. "But they don't know a lot about the Dyson Airblade, which is cleaner than normal hand dryers. So their perception on regular hand dryers sways them to think that the Dysons are bad as well."

Unlike lower-end hand dryers, the Airblade contains an air filter and blows unheated air at a high velocity, creating a bad environment for bacteria growth, the researchers point out.

To combat Airblade misperceptions, the students are designing signage for campus bathrooms. The signs will tout the environmental impact of the Airblades by comparing [carbon-dioxide](#) savings to practical terms, such as trees planted, miles travelled and money saved.

The research team will use study results to encourage campus officials to install more Airblades on UB campuses.

Over the summer, the [students](#) hope to publish their findings in peer-reviewed journals to allow other universities to see their work. They also will examine the collected bacteria samples to determine if any are pathogenic.

Provided by University at Buffalo

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