

The phantom flush: why high-tech toilets waste so much water

Automatic toilets may be convenient and hygienic, but they also waste billions of gallons of water per year. Why hasn't this issue been fixed yet?

Autumn Spanne

Autumn Spanne is an independent journalist who writes on climate change, human rights and sustainability.

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We've all been there. You walk into a public-restroom stall, and the automatic toilet flushes before you come anywhere near it. It flushes again a minute later, then again after that, and perhaps again as you exit the stall.

When they first appeared in the 1990s, automatic-flush toilets were marketed as a more hygienic, no-touch alternative to conventional commodes. They quickly gained popularity in airports, malls, office buildings and other facilities with high-traffic public restrooms.

Today the US Environmental Protection Agency estimates the US has 27m so-called flushometer toilets installed in its restrooms. Many of the older models still in service use 3.5 gallons per flush or more - well beyond the current federal standard of 1.6 gallons. But even newer, more water-efficient models have a reputation for the so-called "phantom flush," which can waste gallons of water at every restroom visit.

"People now expect the flushes numerous times while they're in the stall," says John Koeller, a California-based engineer and water efficiency expert. "It's pretty obvious to water efficiency people that they're big water wasters."

Just as the cumulative effect of a few sprinklers overwatering the sidewalk can add up, a few hyperactive flushomatic toilets can translate into hundreds of gallons of wasted water every day. That might still not make it anywhere near the world's biggest waster of water, but it's a frustratingly clear and public example of waste.

As Ed Osann, a senior policy analyst at the Natural Resources Defense Council (NRDC) water program, puts it: "In terms of the absolute amount of water involved, it's not large, but it's sort of like a sprinkler in a public park that's over-spraying the sidewalk and running into the street."

Measuring a phantom impact

Koeller and Bill Gauley, a colleague in Toronto, Canada, developed what they call the Maximum Performance Testing protocol to independently evaluate toilet water efficiency. Using it, they

performance testing protocol to independently evaluate toilet water efficiency. Using it, they have conducted one of the only independent studies comparing water use by manual-flush versus automatic-flush toilets.

A 2010 report measuring water consumption in the bathrooms of a Tampa office building - before and after the installation of flushometer devices - concluded that the toilets' water use increased by more than 50% after automatic flush systems were installed.

The technology needed to fix phantom flushing already exists: Koeller says that sensor technology has improved in the five years since he and Gauley conducted their study.

At least one device, by Wisconsin-based manufacturer Kohler, minimizes the chances of a movement-triggered misfire by locating the sensor above the toilet facing up so that users must wave their hand over it to prompt a flush.

But despite the availability of better technologies, many older models remain in use because of the high price of upgrading. It can easily cost hundreds of dollars to replace a single toilet.

“Modern automatic sensors are pretty reliable, but the problem is there’s so many of these devices from earlier generations still out there,” says Doug Bennett, a conservation manager at the Southern Nevada Water Authority. “At some point they won’t be available in the marketplace any more, but it’s a slow process. Just like it took a long time before you didn’t see Gremlins or Pintos on the road.”

But NRDC’s Osann disagrees with the claim that this problem is restricted to older devices needing to be retired or adjusted. “We’re seeing this in relatively new buildings that were built within last three or four years,” he says.

Mark Malatesta, a product compliance engineer at toilet maker American Standard, thinks another underreported cause of unintended flushing is improper installation and maintenance. “It’s usually building maintenance or plumbers installing them, and a lot of times there’s just a lack of knowledge about how the products work,” he says. “Once installed properly, you should be good to go.”

Labeling falls short

Meanwhile, the EPA is also working to reduce toilets’ water use. In December, its WaterSense program - the water efficiency counterpart to its Energy Star label, which alerts consumers to energy-efficient appliances - drafted new specifications for flushometer toilets.

In order to qualify for the WaterSense label, new toilets would be required to use no more than 1.28 gallons per flush. The EPA estimates that replacing all the old, inefficient commercial flushometer toilets in the US with WaterSense-approved models would save 41bn gallons of water per year.

While the EPA’s proposed specifications could reduce the volume of water in each flush, they don’t do anything to directly address all the water that goes down the drain with every phantom flush.

Because of this, the NRDC's Osann opposes EPA's decision to include flushomatic toilets in the WaterSense program. "We would not want to see the label attached to devices subject to phantom flush episodes that are clearly wasteful," he said.

Meanwhile, Koeller dismisses claims by some manufacturers that flushomatic products actually save water, and caution consumers to be wary of greenwashing.

"I know of no green building code or standard that rewards sensor-activated flush valves," he said. "The absolute best sensor will only duplicate the one manual flush. It can do no better. But it certainly can - and does - do worse."

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