

As we emerge from a tragic pandemic, let's catalyze action among professionals in the fields that shape the physical housing and communities where we live. This series of case studies shares innovations that are advancing a set of **guiding principles** for built environment professionals—from creative ways to redress inequities and engage the public in participatory planning, to unique housing and community models that enable every resident to thrive.



Photos: Jack Sim: Jack from genie bottle and Katherine Webber: Yellow artistic bathroom.

Restroom Deserts: Where to go when you need to go

By Stephanie Firestone and Julia Glassman

Growing up in the U.S., children are admonished for using “potty talk” in public. While it is an important lesson about language use in appropriate contexts, it is emblematic of society’s broader aversion to talking about human waste—even among policy-makers. Consequently, most cities and communities around the world do not have sufficient public restrooms, and those that are available often are uninviting and do not accommodate people with a variety of needs. Some activity has emerged, if only in a murmur. Public and private organizations and initiatives are advocating for better policy, creating design solutions and educational tools, and innovating in other ways. An even smaller number of initiatives are importantly tackling culture change—often using humor to break through people’s discomfort and normalize conversation about this basic human need shared by every single person on the planet.

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Needs/Challenges

Globally, there is an extremely low number of restrooms available in the public sphere. A recently released “**Public Toilet Index**” has Iceland leading the way, with 56 toilets per 100,000 residents, compared with 8 per 100,000 people in the U.S.. Meanwhile, the **Dutch Toilet Organization** estimates that every person visits the restroom an average of five times a day, so the need is incontrovertible. The public toilet deficit was exacerbated during the pandemic when infection fears led some cities to padlock the few public restrooms available, leading to spikes in **complaints about public urination**.

It is important to note that while this case study focuses primarily on public restroom deserts,¹ some 40 percent of the world—or 3.6 billion people—lack access to safely managed sanitation, even at home. While this problem is most acute in the global south, the American Community Survey estimates that in the United States **nearly 1 million people lack basic sanitation**—the vast majority living in urban areas and disproportionately in low-income communities and communities of color.

The dearth of public restrooms affects nearly everyone, but it impacts some more than others, such as those who struggle with incontinence, older adults, pregnant women, and people with children in tow. Indeed, for older people, the **uncertainty surrounding one’s ability to access adequate restroom facilities** often impacts their willingness to engage in outdoor activities or venture far from their homes. This reduced participation in society can reinforce **isolation, which is considered a major health challenge in many countries—particularly for older people**. How is it that we relegate so little attention to such a basic human function?

“**The World Toilet Organization (WTO) notes that more people around the world today own mobile phones than toilets.**”

Innovations

The World Toilet Organization (WTO) is a global non-profit committed to improving toilet and sanitation conditions worldwide that was founded by Jack Sim in 2001. In 2013, the UN General Assembly designated the date of its founding, November 19, **World Toilet Day**. Indeed, United Nations Sustainable Development Goal number 6 calls for water and sanitation for all by 2030.

While the **U.S. Occupational Safety and Health Administration (OSHA)** and similar bodies in many countries require that employers provide an adequate number of restrooms for their workforce, there are no such standards for the public realm. Additionally, The American Restroom Association (ARA) has advocated for years for “**potty parity**” legislation to address the longer lines for women at public restrooms, arguing that women’s number of toilets should equal the number of men’s (urinals included)—though ideally unisex facilities would reduce the chance of waiting for everyone.

In 2017, **Wales passed a Public Health Act** that requires local authorities to develop a toilet strategy for their area, which includes availability of an adequate number of toilets in popular locations, in addition to accessibility. Katherine Webber, a scholar from Queensland, developed a set of **national public toilet principles** and advocates for their use to guide planners and designers as well as chambers of commerce and businesses throughout Australia. Indeed, across the world, some promising activities and innovations are cropping up to provide access to well-designed and accessible restrooms, so that all members of society can actively engage in the public sphere.



Photo: Katherine Webber

Accessing Public Restrooms

ONLINE TOOLS

Some countries (e.g., England, China, Australia), and increasingly cities and private entities, are creating online, interactive public toilet maps and apps that help the public to locate nearby restrooms. England’s ***The Great British Public Toilet Map*** enables users to filter their searches for restrooms using desired criteria such as changing stations and wheelchair access. In the United States, the **City of Boston, MA created a public toilet map** as part of its age-friendly community initiative, which displays a selected restroom’s exact location, hours of operation, and other important information.

Data collected from one of the first and best-known interactive public toilet maps, **PeePlace**, helped to inform the Public Toilet Index, which compares availability from 84 countries. For example, New York City appears to have only four public toilets per 100,000 people while San Francisco has 26. In addition, several Smartphone **apps** are also under development that use one’s location to identify nearby restrooms. Maps and apps thus far rely on feedback from the public to build and add to their database of toilets and amenities.

SIGNAGE AND WAYFINDING

Posted signs and symbols that are easily legible increase a person’s ability to navigate public spaces and find a restroom. A **public perception study in Turkey** found that 70 of 100 survey participants over age 65, and every survey respondent who had a visual disability, highlighted effective signage as something they strongly need to help them locate public restrooms. Ideally, signage should include distance or travel time among pieces of information that will help a person quickly find the restroom.²



Photos: Katherine Webber

LIVABLE COMMUNITIES

Across the U.S., advocates are increasingly including access to appropriate restrooms in the criteria that determine whether a public space is considered age-friendly. Some cities in **AARP’s Network of Age-friendly States and Communities** (NAFSC) have included restrooms in their age-friendly community action plans as part of their improvements to outdoor spaces and overall desire to encourage older adults to continue participating in their cities. Such jurisdictions include Biddeford, Maine; Delaware County, Ohio; Boulder County, Colorado; and Fairfax, California. For its part, AARP has awarded over \$70,000 in **Community Challenge grants** for ADA-compliant restrooms, handwashing stations, wayfinding signs, and other restroom-related features along trails and in public parks and community gardens.

PUBLIC-PRIVATE COOPERATION

Some private businesses provide access to their restrooms, whether purely for the sake of meeting a public need or perceiving an opportunity to increase their customer base or strengthen customer relationships.

In the municipality of Puente Alto in Santiago, Chile, **RedActiva**, a multi-pronged initiative to encourage older adults to feel welcome in the city, created a colorful wristband for older adults to wear. While wearing the bracelet, older adults can access the bathroom in participating local shops and businesses, which display a sign in their window.

The Association of Southeast Asian Nations (ASEAN) recognized that businesses in the tourism industry rely on tourists and residents alike being able to access restrooms. As part of its strategic plan for tourism expansion in 2002, ASEAN developed common criteria for all public toilets in the region. The **public toilet standard audit checklist** provides user-friendly guidance on how public toilets should be built and maintained based on design and environmental management, amenities and facilities, cleanliness, and safety. Laws in many Asian countries require any business that serves the public to allow the broader public (i.e., regardless of whether or not they are customers) to use their restrooms. Largely due to grassroots efforts, a number of states in the U.S. have passed the **Restroom Access Act**, which requires retail establishments that do not have public restrooms to provide patrons with Crohn’s, colitis, and certain other conditions access to employee-only restrooms.

In many countries around the world, a fee is required to use the bathroom to support upkeep and maintenance. According to **QS Supplies**, the country with the least expensive rate is Cuba, and Switzerland has the highest. In other countries, a fee is charged for toilet paper; **public restrooms in Taiwan**, for example, make toilet paper available for purchase from vending machines. In the U.S., an organization called the **Committee to End Pay Toilets in America** (CEPTIA) successfully led a public campaign to ban pay toilets in 1970.



Photo: Katherine Webber

Design for Accessibility and Inclusivity

Universal design is an approach to designing spaces and products so they are usable by all people, to the greatest extent possible, without the need for adaptation or specialized design. In other words, a design is not specific to people affected by disability but is for all users. For instance, private occupancy bathrooms create opportunities for those with varying physical abilities—from older people to young children—to privately receive assistance from a family member or caregiver.



Photo: Katherine Webber

In the U.S., the Americans with Disabilities Act requires any restroom that serves the general public and employee restrooms to comply with **accessible design standards**, which include elements such as height of toilets and mirrors and minimum restroom size so that a person in a wheelchair can easily maneuver around the space. The American Restroom Association also points to the need for more **family and unisex restrooms**, which usually offer more space than a standard toilet stall.

Europe has moved toward “universal” washrooms and changing rooms—a term generally preferred over “all-gender” or “gender-neutral” and which helps to mitigate violence against particular populations and is picking up traction elsewhere. A **2015 study** of over 27,000 transgender individuals in the U.S. found that in the year prior to taking the survey, 26 percent of all respondents were denied access to washrooms, had their presence in a washroom questioned, and/or were verbally harassed, physically attacked, or sexually assaulted in a washroom.

The group **Stalled!** proposes to decrease restroom violence by creating an open floorplan restroom with seating areas, and having stalls reach all the way to the floor to increase privacy and decrease the likelihood of unwanted attacks. Stalled develops inclusive guidelines for retrofit and new construction projects that take into consideration all people—of different ages, genders, religions, and disabilities, as well as different circumstances (e.g., a person lactating). In 2021 they succeeded to amend the **International Plumbing code**, so this multi-user, all-gender solution now complies with code.

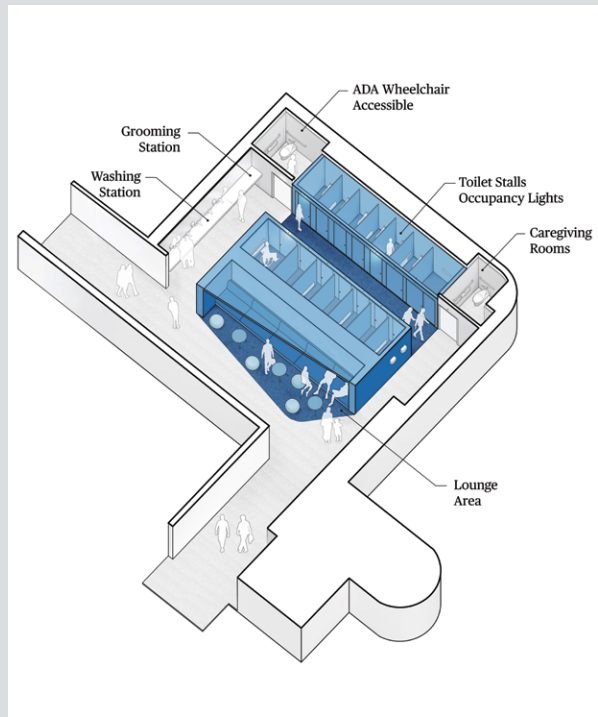


Photo: Stalled!

Leadership from Portland, Oregon

A decade ago, with the rise in the city’s homeless population, Portland City Commissioner Randy Leonard had an idea for a 24-hour restroom with full public access. This would alleviate the need for people to disturb local businesses for their restroom facilities and would reduce public defecation and the spread of disease. The **Portland Loo**® is a durable kiosk with anti-graffiti wall panels that are easy to clean and have easily interchangeable components, and motion sensors that let you know if someone is inside. This universal restroom is accessible to people using wheelchairs or other mobility devices. It is well-lit, with blue lights that mitigate drug use by preventing users from locating veins, and the open bottom and top of the restroom add to personal safety by creating open sight lines and allowing sounds to carry outside the restroom while maintaining privacy for the user. The toilets are energy efficient, are run by solar power, and are connected directly to sewer systems. Portland Loos® are now used in many U.S. cities outside Portland, and a manufacturing plant in New Zealand makes them for use regionally, including in Australia and Southeast Asia.

The Portland-based nonprofit **PHLUSH** (Public Hygiene Lets Us Stay Human) was instrumental in promoting the Portland Loo.® The volunteer-run organization creates free resources to help local governments and citizen groups attain equitable public restroom availability in their cities. For example, the **Public Toilet Advocacy Toolkit** includes strategy tools, such as engaging the community in the conversation and planning for operational and financial sustainability, as well as both action-planning and public-relations tools, such as simplifying codes and regulations and working with journalists. Their advocacy network expands nationwide to include more individuals and volunteers in policy reform, code change, and education surrounding sanitation. Additionally, PHLUSH advocates for the implementation of circular sanitation systems, such as composting toilets, where waste can be recycled back into the ground without the need for excess **water**.



Photos: The Portland Loo®



Toilets for All

In the global south, 2.3 billion people don’t have home **access to a basic toilet or latrine**, even after the UN declared in 2010 that **access to clean water and sanitation is a human right**. Some countries plagued with open defecation are making progress. India’s commitment led to the building of 110 million toilets in less than five years, though **behavior change** among the population lags. At the same time and with little funding, Bangladesh **nearly eradicated open defecation** through a public awareness campaign by partnering with faith-based and other local organizations. Increasingly, philanthropic and private efforts are innovating to address this critical need.

MARKET-BASED MODEL

The World Toilet Organization pioneered the creation of **SaniShop**, a social enterprise that improves sanitation conditions globally by empowering local entrepreneurs to sell household latrines—triggering demand in their community through sales and awareness events and by tapping local influencers. The toilets, which are high quality and cost little to install, are built and supplied by local masons who have undergone SaniShop production and maintenance training. Initially based in Cambodia, the franchise has spread to other countries such as India and Mozambique. The social enterprise has built some 20,000 household latrines and trained over 550 sales entrepreneurs over the last decade.

PHILANTHROPIC INNOVATION

In partnership with the World Bank, the Bill and Melinda Gates Foundation in 2011 issued **Reinvent the Toilet**. The scheme challenged innovators around the world to create a new toilet that does not rely on sewage infrastructure—which carries waste through sewers across many miles to treatment centers for processing and is therefore expensive and water-wasting. Additional aims were to transform waste into useful resources and to limit the cost for use to less than five cents a day. The competition yielded multiple winners, with first place going to the California Institute of Technology for a **solar-powered toilet** that could convert waste into hydrogen and electricity.

Nearly a decade later, **Dr. Shannon Yee**, an associate professor of mechanical engineering at the Georgia Institute of Technology, decided to combine the best of the ideas featured in the challenge and package them into one new,

low-cost toilet to provide safe, affordable sanitation for billions of people around the world. Dr. Yee now leads a group of 70 researchers and private sector partners that are taking the entire process of sewer sanitation and executing it inside a toilet the size of a washing machine.

When flushed—with only a small amount of water—the Generation 2 Reinvented Toilet (G2RT) separates solid waste from liquid waste. The urine and flush water are filtered to produce clean water, which is then recirculated to flush the toilet. The feces are either pasteurized or combusted, producing pressed cakes or dried ash, which falls into a receptacle that users dispose of in the trash or compost.

In 2022, G2RT will begin field tests in people’s homes in South Africa, India, and China. The Yee toilet’s current cost—approximately \$450—still presents a challenge for many, requiring governments and private entities to help support the innovation in the poorest parts of the world.

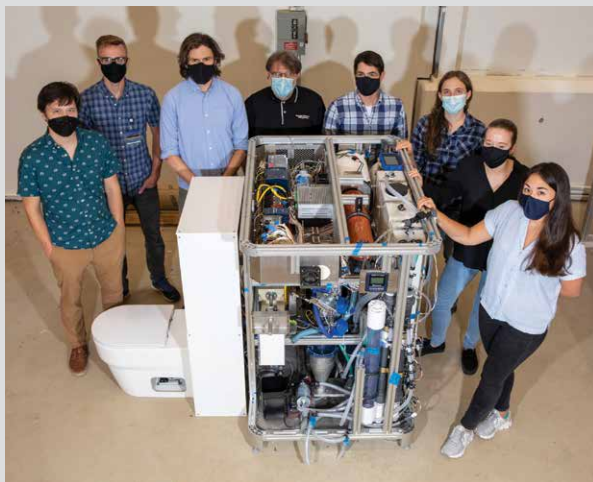


Photo: Dr. Shannon Yee



Photo: Gates Notes: The Blog of Bill Gates

Successes and Replicability

The proliferation of maps and apps alone bodes well for a true public outcry to address a very real problem that historically has been kept out of public discourse. As more localities create toilet maps/apps and engage the public in this enterprise, residents and visitors alike will more directly weigh in and demand access to sufficient and satisfactory facilities.

Additionally, efforts to mainstream this conversation—often through humor—in itself represents progress. For example, through art, theater, and education, the **People’s Own Organic Power** (The POOP Project) lifts up society’s shortcomings in meeting this basic human need and gets people talking about “what we all do doo.” Science Center Singapore hosted a **“seriously fun”** exhibition about the history and evolution of sanitation and toilets. Ideally, by normalizing the conversation more stakeholders will also come to see the issue in economic terms. With greater consumer demand, cities and businesses doing a wee bit more to meet this demand will out-doo their competition.

¹ Grateful to PHLUSH for this term.

² Conversation with Katherine Webber, March 2022.