

# The Way We Wee

## An Analysis of the Women's Restroom Line & Proposed Solutions

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## PREFACE

I am fascinated with design flaws that are so well integrated into society that we no longer perceive them. One obvious example is that of the women's public restroom line. All over the world, women's restroom lines typically exceed those of men's.

In writing this dissertation, I was curious why this problem persists. Bathroom behaviors have been studied over and over, and the conclusions almost always support the same solution: women need more toilets. My intention was to develop a better understanding of this problem and hopefully come up with a new solution.

In the initial analysis, the answer seemed simple: a female urinal. But after more research, I discovered that this was far from an original idea: in fact, industrial designers and inventors have attempted and failed at instituting female urinals many times before.<sup>1</sup>

Because this problem is so widespread, I wanted to examine the history of bathroom and toilet design to see if there were clues as to why this problem persists. From this cross-time and cross-cultural analysis, it became clear that the women's bathroom line is deeply embedded with socio-political issues. Toilets have historically been used as a tool for discrimination and so it felt important to highlight how the bathroom line symbolizes injustice.

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<sup>1</sup> A. Piccoli, 'This is Lady P', *Mediamatic*, <https://www.mediamatic.net/en/page/234343/this-is-lady-p>. (Accessed June 18, 2019)

O. Levinson, (April 16, 2002). United States Patent No. US 6,370,705 B1.

R. Anderson, (May 13, 1980). United States Patent No. 4,202,058.

K. Jones, (Aug 4, 1987). United States Patent No. 4,683,598.

In the end, I addressed this design problem, not from a product design perspective, but rather from a more holistic, systems design perspective. In doing so, I uncovered creative alternative solutions that, though unorthodox, have the potential to go well beyond the women's restroom line.

This paper primarily focuses on the US and Europe, with some examples from Japan, China and India. Additionally, Turkish, African and Latin American toilets were considered but need to be evaluated more thoroughly, along with those of many other countries.



## INTRODUCTION



*"I've seen a few frightening dramas on Broadway, but nothing on stage is ever as scary as the scene outside the ladies' room at intermission: that long line of women with clenched jaws and crossed arms, muttering ominously to one another as they glare across the lobby at the cavalier figures sauntering in and out of the men's room. The ladies' line looks like an audition for the extras in "Les Miserables"—these are the vengeful faces that nobles saw on their way to the guillotine—except that the danger is all too real."*<sup>2</sup> - John Tierney for the New York Times

The public bathroom is the ultimate paradoxical space: it is where we experience the incredibly intimate yet decidedly public. It is where we cleanse ourselves or "freshen up" but also where we make the most embarrassing noises and foul smells. It is where things are designed to *appear* clean, in an effort to make us forget the millions of microbes resting on every surface. It is no wonder many of us feel uncomfortable using the space. And yet, access to public restrooms is a basic human need and human right.

Surprisingly, this right is still a contentious issue in many places around the world. The upcoming chapters will examine variation in toilet design in different regions over time. They will investigate the relationship between restroom design and societal attitudes, focusing on privacy, etiquette, waste attitudes, safety, sanitation and access. Through this study, we will see how non-inclusive design can be the tip of the iceberg of discrimination. Finally, using holistic, systems-based design, we will consider a few unorthodox solutions to the women's bathroom line.

<sup>2</sup> John Tierney, 'Bathroom Liberationists', *The New York Times*, Archives (September 8, 1996)

## CHAPTER 1: PRIVACY, ETIQUETTE & WASTE ATTITUDES

Concepts of privacy, cleanliness and attitudes towards waste vary widely by culture. This variation manifests in toilet shape and design. For instance, squat toilets are common throughout Asia and the Middle East, whereas throne or seated toilets are widespread in the West. Japan has refined the western throne style toilet with its ever-impressive Washlet. Each of these differentiations reflects a different ideology.

Consider how toilets in France differ from toilets in Germany and the United States. According to Slavoj Žižek, it is no accident that toilet design varies from culture to culture. He introduces the concept of *flush ideologies*, whereby societal values are reflected in the chosen style of toilet. In a video recording he notes:

*“[...] the toilets in America, France and Germany make up a semiotic triangle that correlates exactly to Levi Strauss’ triangle so we also have an excrement triangle. Now the German toilets are built in a way that excrement falls on a flat surface at the back and is flushed through a hole at the front. This way you are directly confronted with excrement –and you can see whether you have worms etc. This is a German ritual. The French toilets have the opposite system; the hole is bigger and at the back, so excrement can fall directly into the hole and vanishes immediately. The American variant is a kind of correlative of Levi-Strauss’ cooked food, combining the elements: the excrement remains but it floats in the water. [...] every nation believes their system makes the most sense. But clearly a complex system is at work here. And if I am to carry on of ideology, period. Yes, but as soon as*

*you flush the toilet, you’re right in the middle of an ideology.”<sup>3</sup>*

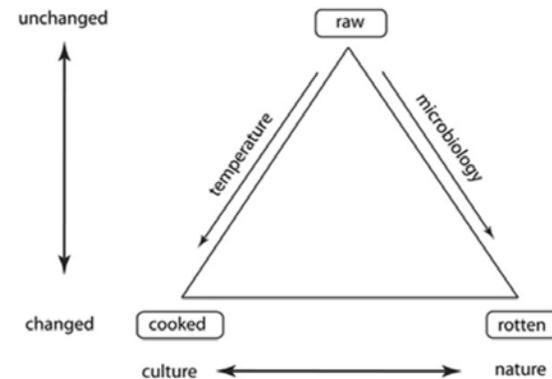


Figure 1: Levi-Strauss’ Culinary Triangle

Claude Levi-Strauss created the Culinary Triangle—a universal map that allows for cross-cultural analysis of food preparation methods. In creating this diagram, Strauss believes:

*“we can hope to discover for each specific case how the cooking of a society is a language in which it unconsciously translates its structure—or else resigns itself, still unconsciously, to revealing its contradictions.”<sup>4</sup>*

<sup>3</sup> Slavoj Žižek, Transcribed from video lecture given by at an Architecture congress in Pamplona, Spain. <https://www.youtube.com/watch?v=AwTJXHNP0bg> (accessed June 20, 2019)

<sup>4</sup> Claude Lévi-Strauss, 'The Culinary Triangle', *Partisan Review*, 33, no. 4 (1966): p586–595

In relating toilets to the Culinary Triangle, Zizek reveals the importance of toilet design. He implies that through an analysis of toilet design, we can uncover hidden meaning, structure and cultural ideologies. Do French toilets, in hiding excrement, reflect the same *Joie de Vivre* that is evident in their enjoyment of wine and cheese? Do German toilets, in presenting excrement for inspection, show the same fastidious nature that is revealed in the specificity of their language? Further research could unveil interesting conjectures.

Barbara Penner also argues restrooms are “culturally determined and historically specific”; they are a reflection of the society that created them and “directly reflect the dominant political ideology.”<sup>5</sup> Thus, there may be much more to toilets and bathrooms than functionality. Inherent in toilet design and the behaviors they engender are hidden traces of societal belief systems.

Consider the example of the evolution of the Japanese toilet and its surrounding architecture. Prior to western exposure, most traditional Japanese toilets were communal and “off the grid,” unconnected to piped systems. Some of these toilets were at the edge of a cliff, others were on a moat, and others used seashells to cover waste.<sup>6</sup> After World War II, Western-style throne toilets were introduced, although they did not become popular until the late 1970s. Then in 1980, the Japanese company Toto invented the Washlet—a sort of smart toilet, with an electric seat warmer, automatic bidet

<sup>5</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p18

<sup>6</sup> Akira Matsui, Masaaki Kanehara & Masako Kanehara, 'Palaeoparasitology in Japan - Discovery of Toilet Features', *Men Inst Oswaldo Cruz*, Rio de Janeiro, Vol 98, Suppl. 1, (2003): p127-136

function and a flush sound to cover embarrassing bathroom noises. These toilets are of increasing popularity and can be seen throughout Japan today.<sup>7</sup>

As architecture academic Julian Worrall argues, along with incoming western influence came the ideological rise of privacy. “Privacy is a distinctly modern concept, associated with a worldview focused on the individual rather than the family or the group, as such was unknown in traditional Japan—as can be imagined in a society where houses have walls made of paper.” Indeed in parallel to the change in toilets, came architecture changes as well. For the past 40 years, single-person households have been the fastest rising demographic throughout Japan. These households often include the ‘unit bath,’ a manufactured windowless box fitted with toilet, sink and shower. These units are the ultimate physical manifestation of privacy—small and secure—and are in stark contrast to the historic Japanese public bathhouses (*sentō*) of pre-modern times.<sup>8</sup>

Much like the Japanese, ancient Romans were fond of public toilets and communal bathing. But in contrast to the Japanese, Roman public restrooms were much more public: they were in an open room, with toilet-lined walls, one right next to the other, with no stalls or barriers. Rather than toilet paper, they used a shared tersonium—a communal sponge on a stick.<sup>9</sup>

<sup>7</sup> Julian Worrall, 'In Praise of Privacy', in *Dirty Furniture*, 'Toilet', (London: Dirty Furniture, September 2016)

<sup>8</sup> Ibid.

<sup>9</sup> Stephen E. Nash, 'What did ancient Romans do without toilet paper?', *Sapiens*, (April 3, 2018) <https://www.sapiens.org/column/curiosities/ancient-roman-bathrooms/> (accessed March 13, 2019)



Figure 2: Roman Public Latrines

While the lack of privacy in these toilets may surprise the modern Westerner, it is important to keep in mind that attitudes towards privacy, etiquette and waste are culturally derived. For instance, in Beijing, public toilets of the 1950s were places for social interaction. Due to the lack of indoor plumbing in private residences and lack of outdoor social centers in a neighborhood, “neighbors would naturally rub elbows and chat about neighborhood news” in the public toilets.<sup>10</sup> Many of these public facilities had “no dividing walls

<sup>10</sup> Tim Geisler, ‘On Public Toilets in Beijing’, *Journal of Architectural Education*, (May, 2000): p217

between toilet holes, making casual on-the-stool chats quite convenient.” Indeed, Chinese attitudes about bodily functions in general are quite different than in the West—people are much freer to belch, cough and spit in public.<sup>11</sup> So it is not hard to imagine how different societies may interpret restroom etiquette in different ways.

In all these cultures, the design of toilets and their surrounding space reflect different ideologies. Like architecture, bathroom and toilet design can point to societal views on privacy, etiquette and waste. As Kira points out, “it must be recognized that our attitudes at any given place and [...] time represent potent influences on design.”<sup>12</sup>

But what happens when the subject of excrement and toilets become taboo? As Kira notes, in many places, “societal and psychological taboos [around excrement] seem almost to have built up into a culture-wide embarrassment.”<sup>13</sup> This relationship with excrement is paradoxical. As Penner points out, there is a cultural “disconnect between the architecture of the water system and [the] reality of its use.” Indeed, how much time do we spend thinking about what happens to our excrement after flushing the toilet? Furthermore, how many conversations address such matters? Considering the system’s complexity, frequency of use, and momentous importance in our daily lives, perhaps it should make its way into more thought and conversation. But because of our ever-present waste disconnect, we pay little attention to such matters. This disconnection is at the root of our social and psychological

<sup>11</sup> Ibid.

<sup>12</sup> Alexander Kira, *Bathroom*, (New York: 1966)

<sup>13</sup> Alexander Kira, *Bathroom*, (New York: 1966), Preface p iii

attitudes around bathrooms and waste.

Origins of the Western relationship with excrement point to the Middle Ages, when bourgeoisie began to differentiate themselves from the proletariat by increasingly dissociating themselves from their natural need for excretion. In concealing this need, the upper class “saw themselves as able to transcend the inferior natural world by denying and hiding the need for excretion.” Thus began increasing social pressure to conceal one’s natural need for elimination, as Judith Plaskow deems “the radical disassociation of the self and its excreta.” From these pressures derives our current waste attitudes that we see in most of the world today.<sup>14</sup>

These attitudes are not only seen in our relationship with our biological waste, but in our relationship with waste in general. Most societies today are so far removed from trash, that we are consuming and piling up un-recycled materials at unprecedented levels. It is estimated that between 1.15 and 2.41 million metric tonnes of plastic are entering the ocean each year.<sup>15</sup> Yet most of us are so completely divorced from our waste, that we are shocked to learn that we have created entire islands the size of a small continent, full of plastic trash. Indeed one of the biggest environmental catastrophes of today could be caused by the design element of divorcing people from their waste. While it may be pleasant to have someone else pick up one’s refuse, it has larger ecological complications that can dramatically affect the entire ecosystem. Is time for

<sup>14</sup> Judith Plaskow, ‘Embodiment, Elimination and the role of Toilets in Struggles for Social Justice’, *CrossCurrents*, (2008): p57

<sup>15</sup> Laurent C. M. Lebreton, et al., ‘River plastic emissions to the world’s oceans,’ *Nature Communications* 8, no. 15611 (June 2017), <http://doi.org/10.1038/ncomms15611> (accessed May 27, 2019)

us to reconsider our relationship with waste?

Figure 3: The Great Garbage Patch



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## CHAPTER 2: SAFETY & SANITATION

Perhaps the most famous toilets from antiquity are the Roman public latrines. Public life was very important in ancient Rome and so it is no surprise that the Romans were among the first to implement a public restroom structure. Utilizing sewers for waste removal, the Romans' plumbing and sanitation were impressively advanced for its time. They placed pans below the toilets for stool collection and used the refuse to fertilize crops.. Unfortunately for the Romans, sanitation was not yet well understood. They believed that dust and flies were responsible for disease rather than water and food-borne illness.<sup>16</sup> Thus, their seemingly ingenious re-use of human waste as fertilizer spread parasites through crops and into their uncooked food, causing illness and health problems throughout the population.<sup>17</sup>

Toilet sanitation continued to be an issue for centuries, manifesting in different ways in different societies. In London, throughout most of the 1800s, cholera and typhoid outbreaks were frequent. It was common belief that infectious diseases were transmitted through miasma—the air above stagnating waste.<sup>18</sup> Due to this misunderstanding of how disease spreads, many people died from cesspool contamination in the Thames. It was not until Louis Pasteur and Robert Koch's

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<sup>16</sup> Lord Amulree, 'Hygienic conditions in ancient Rome and modern London' *Medical history* 17.3 (1973): p247

<sup>17</sup> Stephen E. Nash, 'What did ancient Romans do without toilet paper?', *Sapiens*, (April 3, 2018) <https://www.sapiens.org/column/curiosities/ancient-roman-bathrooms/> (accessed March 13, 2019)

<sup>18</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p64-65

microbiology research in the 1880s that germ theory and the concept of water-borne contamination were widely accepted.<sup>19</sup>

Despite the elapsed time, water-borne sanitation issues are still present in many places today. About 60% of the global population either has no toilet at home or has one that does not safely manage excreta. Open defecation is still practiced by 892 million people, and 1.8 billion people use an unimproved source of drinking water with no protection against fecal contamination. Globally, 80% of the wastewater generated by society flows back into the ecosystem without being treated.<sup>20</sup>

For women in India, the lack of toilet facilities poses not only discomfort but a serious safety threat. According to Jagmati Sangwan, a women's rights activist:

*"so many women, especially landless women, face a lot of violence when they go to the bathroom outside."<sup>21</sup> To avoid being stared at during the day, many women hold out for hours until nightfall, which creates many health problems like urinary tract infections, especially during pregnancy."<sup>22</sup>*

For these public health reasons, the United Nations declared in 2010 that access to clean water and sanitation to

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<sup>19</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p115

<sup>20</sup> <http://www.un.org/en/events/toiletday/> Accessed March 19, 2019

<sup>21</sup> Jeffrey Gettleman, 'For India, toilets are (mostly) a serious issue', *New York Times*, (September 3 2017) <https://www.nytimes.com/2017/09/03/world/asia/india-toilet-movie.html> (accessed February 3rd, 2019)

<sup>22</sup> BK Padhi, KK Baker, A Dutta, O Cumming, MC Freeman, et al. 'Risk of Adverse Pregnancy Outcomes among Women Practicing Poor Sanitation in Rural India: A Population-Based Prospective Cohort Study', *PLOS Medicine* 12(7): e1001851(2015), <https://doi.org/10.1371/journal.pmed.1001851>

be a basic human right. Toilet access has moved higher up on the international development agenda, and there are several organizations working at solving the problem.<sup>23</sup> The Bill and Melinda Gates Foundation initiated the *Reinvent the Toilet Challenge*, encouraging researchers and engineers around the world to generate new approaches to toilet technologies for the developing world. This challenge has been repeated throughout the years in collaboration with different countries. Some of the toilets currently being tested on-site are not only sanitary but also eco-friendly, using no water and operating entirely off-the-grid.<sup>24</sup>

Even now, access to clean toilets is a serious issue for public health and safety. Especially for women, who are inherently more vulnerable to attack and assault, safe toilet access is critical to leading a healthy life. It is easy to take toilets for granted in the West, but in developing countries having access to a clean and secure toilet is not just a matter of comfort but a matter of safety and vitality.



Figure 4: Waterless Toilet Prototype from 'Reinvent the Toilet Challenge'

<sup>23</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p38

<sup>24</sup> <https://www.gatesfoundation.org/What-We-Do/Global-Growth-and-Opportunity/Water-Sanitation-and-Hygiene/Reinvent-the-Toilet-Challenge-and-Expo> (accessed March 13, 2019)

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## CHAPTER 3: RESTRICTING ACCESS

This chapter addresses why restricting bathroom access is a major problem. Because of our repudiating relationship with excrement, and the dangers that ensue from lack of sanitation, societies have been able to use bathroom access as a means for control. As the editors of *Dirty Furniture* magazine put it: “Power and toilets have always been intimately linked: they encapsulate the struggle between control and vulnerability.”<sup>25</sup> ‘Walking the line’ between the need for sanitation standards and the need for social decency, governments, organizations and workplaces have consistently used the public toilet as a means for control. Because of the sensitivity of the topic, and the innate vulnerability of the space, it has been an easy area for organizations to implement control and power over marginalized populations.

A classic example of this can be seen in the United States pre-civil rights era. Due to the implementation of ‘*Separate but Equal*’ Jim Crow laws, people of color were allotted separate public spaces from white people. This law applied to everything from hotels and restaurants to public restroom facilities. But often, these facilities were not equal. Indeed, restrooms for African Americans were often poorly maintained, dirty, outdoors or non-existent.<sup>26</sup> This lack of access for non-white Americans restricted their ability to participate in public

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<sup>25</sup> Jane Norris ‘A view from the Throne’, in ‘Toilet’, *Dirty Furniture*, ed. Anna Bates, Elizabeth Glickfeld and Peter Maxwell, (London: Dirty Furniture, September 2016) p17

<sup>26</sup> Kathryn H. Anthony and Meghan Dufrense, ‘Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms’, *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007) p269-270.  
Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p22-23,200

life. Black people traveling on trains or buses had to find bushes or trees to relieve themselves, risking exposing themselves or worse, having to urinate in their pants. As African-American lawyer Tanya Lovell Banks recalls from her childhood:

*“I experienced this form of oppression. [...] You had to plan ahead if you might need to use a toilet away from home. If you did not plan ahead, you faced possible humiliation.”*<sup>27</sup>

In this way, public bathrooms were a physical manifestation of the racist American values of the time. It was commonly thought that blacks were dirty and carried more venereal disease than whites, and therefore sharing bathrooms would put white people at a health risk.<sup>28</sup> Even after desegregation laws were put into effect, stereotypes still lingered and were used to justify bathroom discrimination. The city of Memphis, Tennessee tried to justify its refusal to integrate toilet facilities in the newly-desegregated public library due to “valid health reasons for racially separate toilets.”<sup>29</sup> Tapping into societal fears, like those of germs and disease, is a common catalyst for controlling marginalized populations.

During the HIV/AIDS epidemic in the 1980s, it was a common urban legend that the virus could be spread via toilet seat contact. This myth allowed for a culturally validated form

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<sup>27</sup> Taunya Lovell Banks, ‘Toilets as a Feminist Issue: A True Story’, 6 *Berkeley Women’s L.J* (1991) p263

<sup>28</sup> Turner v Randolph, 195 F Supp 677. *WD Tenn*, (1961) p679-80

<sup>29</sup> See footnote in Taunya Lovell Banks, ‘Toilets as a Feminist Issue: A True Story’, 6 *Berkeley Women’s L.J* (1991) p266

of discrimination, whereby people could openly discriminate against homosexuals, for fear of contracting or spreading the virus. Myths like this exemplify how toilet habits have historically been used “to assert the cultural and biological inferiority of subaltern groups and classes.”<sup>30</sup> The public restroom is an easy target for this type of fear-mongering, as it is such an intimate space where people from all social classes mix, and therefore, so do all of their germs.

Yet threat of illness was not the only way in which bathroom access is used to marginalize populations. Prior to the women’s liberation movement, bathroom access was also used as a means to control women’s participation in society. One example is with Ivy League universities in the United States in the 1960s. Several institutions such as Yale Medical School, Harvard Law School and the Bronx and Brooklyn Bar Associations claimed that they were unable to admit women into their school because no restroom facilities were available for them. Even as recently as 1996, the Virginia Military Institute used the same excuse.<sup>31</sup> Here, you see respected institutions using the lack of bathroom access as a means for maintaining gender discrimination. How could they admit women with these inherent infrastructural limitations?

The same infrastructural bias can be seen in governmental buildings. Until 1993, male senators had a facility right outside the Senate chamber; however, female senators had to go all the way downstairs and wait in line with tourists visiting

<sup>30</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013) p21

<sup>31</sup> Alan M. Dershowitz, *The Abuse Excuse and Other Cop-outs, Sob Stories and Evasions of Responsibility* (Boston, New York Toronto and London: Little Brown and Company, 1994), p 284  
Deborah L. Rhode, *Justice and Gender: Sex Discrimination and the Law* (Cambridge: Harvard University Press, 1989) p 24

Capitol Hill, because there were no available restrooms for women near the Senate chamber. In fact, the men’s restrooms were marked “Senators Only,” an implicit assumption that senators could only be male.<sup>32</sup> According to one New York State assembly woman:

*“we had to tell the doorman whenever we were leaving the floor to visit the restroom—it took so long to get there and back, we were afraid of missing a vote... It was like getting a permission slip from your teacher.”<sup>33</sup>*

For over 60 years—the first female senator was elected in 1932—female senators put themselves at risk of missing a vote every time they went to the restroom.

In some cases, restriction of bathroom access can be a sign of harassment. In a recent episode of the podcast *This American Life*, an airport security guard is interviewed for her heroism in the workplace for standing up for her rights. In the episode, she describes how her boss punished her for refusing to allow him to take nude photos of her. Because her workstation was far out on the runway, she needed to request permission for bathroom breaks. Her supervisor would refuse to give her (and various other female staff) breaks on long 8-10 hour shifts. This caused a great deal of emotional and physical pain for the female employees, some of whom came up with creative solutions for urinating into a cup while under video

<sup>32</sup> Sarah A. Moore, ‘Facility hostility? Sex discrimination and women’s restrooms in the workplace.’ *Georgia Law Review*, 36, (2002) p599

<sup>33</sup> Gail Collins, ‘Potty politics: The gender gap’, *Working Woman*, (March, 18 1993) p93

surveillance.<sup>34</sup> Indeed, in this case, it is clear that bathroom access was used to control female employees.

While the previous example is blatant, there are other examples of more subtle restriction of access, where a group's needs are simply neglected. These types of design flaws are more difficult to spot. In consequence, it can take a long time for them to be corrected. An example of this is with the Americans with Disabilities Act. Before 1968, people with disabilities, especially those in a wheelchair, had no options for bathroom use in any public space whatsoever. Architects had designed spaces without considering those with different abilities. The first legislation to correct this measure was the Architectural Barriers Act which required that federal government buildings be constructed to accommodate people with disabilities. Yet it was not until 1990 that buildings in the private sector, including those with public bathrooms, were required to eliminate physical, communication and procedural barriers.<sup>35</sup> Many places today still do not have adequate bathroom access for women and people with disabilities.

As recently as 2017, the Trump administration tried to control bathroom use, thereby restricting the rights of transgender individuals. President Trump "rescinded [Obama-era] protections for transgender students that had allowed them to use bathrooms corresponding with their gender

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<sup>34</sup> Ira Glass, 'La Donna', *This American Life*, National Public Radio, Episode 647, (August 11 2017)

<sup>35</sup> Kathryn H. Anthony and Meghan Dufrense, 'Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms', *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007) p270

identity."<sup>36</sup> This was followed by government-run organizations attempting to restrict the restroom rights of transgender individuals who prefer to use the bathroom of their choice. This has affected many trans individuals' safety and well-being. Indeed, it is common for transgender people to be subjected to violence and harassment when using the restroom. In May 2018, a student, Gavin Grimm, won a Supreme Court case against Gloucester County school board, whose school administrators had prohibited him to use the boys' room at school.<sup>37</sup> Likewise, North Carolina and Texas have also seen failure in their attempts to legislate control over transgender bathroom use.<sup>38</sup>

Over the last three decades, the number of free publicly accessible toilets in major cities such as Paris, London and several US cities has declined. The main reasons for the closures are lack of funding and inability to convert for wheelchair use.<sup>39</sup> Some countries like those in the European Union have opted for pay-per-use toilets. Charging for restroom access is a contentious issue. Indeed, it solves one problem—funding—while causing another—unjust or prohibitive access for homeless people, those with illness who need to use the facilities frequently, women (due to

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<sup>36</sup> Jeremy W. Peters, Jo Becker, and Julie Davis Hirschfeld, 'Trump Rescinds Rules on Bathrooms for Transgender Students', *New York Times*, (Feb 22, 2017), <https://www.nytimes.com/2017/02/22/us/politics/devos-sessions-transgender-students-rights.html> (accessed May 22, 2019)

<sup>37</sup> Matt Stevens, 'Transgender Student in Bathroom Dispute Wins Court Ruling', *New York Times*, (May 22, 2018), <https://www.nytimes.com/2018/05/22/us/gavin-grimm-transgender-bathrooms.html> (accessed March 13, 2019)

<sup>38</sup> <https://www.nytimes.com/2017/08/08/us/time-is-running-out-on-texas-bathroom-bill.html>

<sup>39</sup> R. Stanwell-Smith, 'Public toilets down the drain? Why privies are a public health concern' *Public Health*, 124 (2010) p613-616

menstruation or pregnancy) and people with children.<sup>40</sup>

In many cities, free public facilities have closed by design in order to deter illicit activity or homeless people from using the facilities. These intentional closures have been ineffective. Julien Damon, Associate Professor at the Institute of Political Studies, states:

*“the disappearance of these toilets or charging, albeit minimal, for their use, have had [negative] effects. Those that the measures were intended to keep away no longer go, but they become even more visible by being forced to relieve themselves directly in the public space in front of everybody. Furthermore, all passers-by who do not have change on them or who cannot find superloos are forced to adopt unpleasant precautions or self-restraint, or as a last resort, to find solutions in places not intended for such purposes... The dilemma is obviously disproportionate for persons without private spaces and toilets, i.e. people who are homeless who are constantly confronted by such needs.”<sup>41</sup>*

Before the 1970s, there were many places in the US that charged for women’s toilets, but not male urinals. Naturally this was an area of protest during the women’s movement, for the obvious gender injustices. In April 1969, Assemblywoman March Fong Eu broke a porcelain toilet with a sledgehammer on the steps of the California State Capitol in protest of the practice of charging for toilet access.<sup>42</sup> Although her bill did not pass, others did and many big cities soon followed suit on

<sup>40</sup> Kathryn H. Anthony and Meghan Dufrense, ‘Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms’, *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007)

<sup>41</sup> Julian Damon, ‘For Public Toilets...’ *FEANTSA magazine*, Summer (2007) p5

<sup>42</sup> Barbara Penner, *Bathroom* (London: Reaktion Books, 2013), p228

banning pay toilets in most American cities.<sup>43</sup>

Since then, charging for toilet access in the US is either illegal or uncommon, although many restaurants have an arguably equally discriminatory policy of “restroom access for customers only.”<sup>44</sup> This is problematic for the homeless population, especially in cities like San Francisco, where many homeless are forced to defecate on the street.<sup>45</sup> Public restroom facilities in most American cities are hard to find, and even places like gas stations usually have locked restroom doors with “customer only” policies.<sup>46</sup> Both for homeless people and people with disabilities, these policies, though legal, are still harmful, discriminatory and restrict livelihood.

Next, consider a less obvious barrier to access: clothing. In studying bathroom behavior, designers have found that one of the main causes of women’s restroom lines is women’s clothing.<sup>47</sup> In order to use the facilities, women wearing pants need to disrobe, which takes time. Additionally, women are more likely to be carrying purses. This poses a problem as many facilities do not provide adequate storage space for a

<sup>43</sup> Ibid.

<sup>44</sup> Joyce M. Rosenberg, ‘Restrooms for customers only? In most cases it’s legal to enact such a policy.’ *The Associated Press, USA Today*, (May 14, 2018), <https://eu.usatoday.com/story/money/small-business/2018/05/14/restrooms-customers-only-most-cases-its-legal/607614002/> (Accessed May 16, 2019)

<sup>45</sup> Nathan Robinson, ‘Why is San Francisco covered in human feces?’, *The Guardian*, (October 18, 2018) <https://www.theguardian.com/commentisfree/2018/aug/18/san-francisco-poop-problem-inequality-homelessness> (accessed May 28, 2019)

<sup>46</sup> Kathryn H. Anthony and Meghan Dufrense, ‘Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms’, *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007) p 269

<sup>47</sup> Ibid.

Erma Bombeck, ‘It’s a fact: Women designed to spend time in restrooms.’ *San Diego Union Tribune*, Sec. E p 2, (March 11, 1994)

purse during toilet use and hand washing.<sup>48</sup>

Although it is easy to dismiss fashion as trivial when considering access to public life, history demonstrates that it is more influential than it appears to be. Many feminist scholars have explained how the shift from women wearing skirts to pants was symbolic of their rising equality and freedom. As Lisa Tickner states:

*“it would seem that two such extensive alterations—the one in role and the other in appearance—cannot be coincidental, or even parallel but must surely be interwoven.”<sup>49</sup>*

And while this shift from pants to skirts was critical in second-wave feminism, clothing-based discrimination lingers today. *The Pudding*, a data visualization website, did an analysis comparing men and women’s jeans pocket size. They found after controlling for the size of the person wearing the pants, that men’s front pockets were significantly larger than women’s.<sup>50</sup> This smaller pocket size is important because it restricts the space available for personal items, requiring many women to bring a purse. While this may seem trivial, it is in fact important—carrying a purse makes a person more vulnerable to theft and attack. It also contributes to women’s bathroom lines—women with purses need a place to put it while in the stall and washing hands, and managing this takes

<sup>48</sup> Denise Scott Brown, ‘Planning the Powder Room’, *AiA Journal*, (April 1967), p82

<sup>49</sup> Lisa Tickner, ‘Women and Trousers’, *Leisure in the twentieth Century*, Design Council, (1977) p66

<sup>50</sup> Jan Diehm and Amber Thomas, ‘Someone clever once said women were not allowed pockets’, *The Pudding*, (August 2018), <https://pudding.cool/2018/08/pockets/> (accessed June 10, 2019)

time.<sup>51</sup>

As Anthony & Dufresne (2007) stated, throughout history:

*“public restrooms have reflected various forms of discrimination. Not only have they embodied gender discrimination, favoring the needs of men over those of women, but also they have mirrored social discrimination among classes, races, levels of physical ability and sexual orientations.”<sup>52</sup>*

Thus, perhaps we should put more energy into re-evaluating norms like those of bathroom lines and pants.

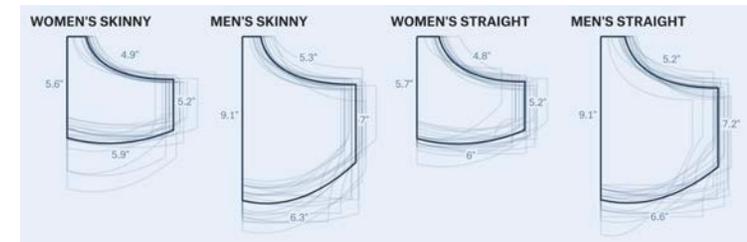


Figure 5: Pocket size comparison in men's and women's jeans

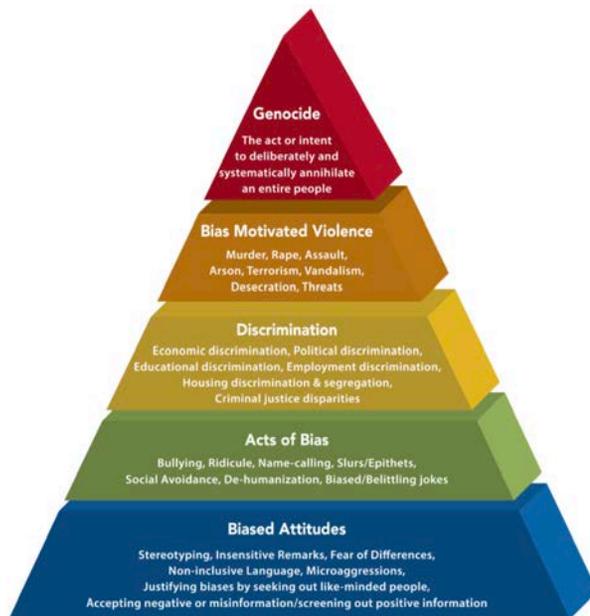
<sup>51</sup> Denise Scott Brown, ‘Planning the Powder Room’, *AiA Journal*, (April 1967) p82  
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<sup>52</sup> Kathryn H. Anthony and Meghan Dufresne, ‘Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms’, *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007) p269

## CHAPTER 4: STRUCTURAL VIOLENCE

Consider the Pyramid of Hate, a tool developed by the Anti-Defamation League to show how low levels of bias can easily lead to higher levels of violence.

Figure 5: The Pyramid of Hate



*“The Pyramid shows biased behaviors, growing in complexity from the bottom to the top. Although the behaviors at each level negatively impact individuals and groups, as one moves up the pyramid, the behaviors have more life-threatening consequences. Like a pyramid, the upper levels are supported by the lower levels. If people or institutions treat behaviors on the lower levels as being acceptable or “normal,” it results in the behaviors at the next level becoming more accepted.”<sup>53</sup>*

Although the Anti-Defamation League’s focus is to stop defamation of Jewish people, their pyramid can be applied to many different groups that are subject to discrimination. Indeed, this pyramid has been adapted as the “Rape Culture Pyramid,” the “White Supremacy Pyramid,” and the “LGBTQ Hate Pyramid,” to show how negative attitudes towards each group can lead to rape, violence or mass murder.<sup>54</sup>

But where does Non-Inclusive Design lie on the pyramid? Surely, Inclusive Design is just as important as inclusive language, if not more so. It affects how people live their lives. When biased physical, structural or systemic barriers are in place, it hinders those who have been excluded. As the previous examples show, whether non-inclusive design is intentional or not, it harms those who are left out. As history reveals, non-inclusive bathroom design has harmed minorities,

<sup>53</sup> Anti-Defamation League, ‘Pyramid of Hate’, <https://www.adl.org/sites/default/files/documents/pyramid-of-hate.pdf> (accessed June 6, 2019)

<sup>54</sup> Several examples can be found online, (all accessed June 6, 2019)  
[https://www.communitysolutionsva.org/files/Rape\\_Culture\\_Pyramid\\_discussion\\_guide.pdf](https://www.communitysolutionsva.org/files/Rape_Culture_Pyramid_discussion_guide.pdf)  
<https://www.delmarvapublicradio.net/post/pyramid-white-supremacy-draws-controversy-su>  
<https://socialsciences.exeter.ac.uk/media/universityofexeter/collegeofsocialsciencesandinternationalstudies/research/interventioninitiative/resources/PyramidDiscriminationViolence.pdf>  
<https://medium.com/@maatjaganmata/jaganmata-presents-the-pyramid-of-lgbtq-hatred-1b38108a475c>

women, disabled and LGBTQ people for a long time.

Returning to our initial subject, the women's bathroom line is an example of such non-inclusive design. In considering the pyramid, the acceptance of this seemingly insignificant problem could reinforce biased attitudes, and feed into the escalation of violence against women. As legal scholar Sarah Moore argues:

*"restroom inequality is a form of subtle sexism. [...] It often goes unnoticed and is considered normal, natural or acceptable. It is in effect to maintain the lower status of women."*<sup>55</sup>

This form of discrimination has been called 'structural violence.' As Johan Galtung, peace and violence scholar explains, structural violence is indirect: "there may not be any person who directly harms another person in the structure. The violence is built into the structure and shows up as unequal power and consequently as unequal life chances."<sup>56</sup> This is in opposition to personal violence, which is when one person directly harms another person. Galtung gives the following example:

*"when one husband beats his wife there is a clear case of personal violence, but when one million husbands keep one million wives in ignorance there is structural violence. Correspondingly, in a society where life expectancy is twice as high in upper as the lower classes, violence is exercised even if there are no concrete actors one can point*

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<sup>55</sup> Kathryn H. Anthony and Meghan Dufrene, 'Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms', *Journal of Planning Literature*, Vol. 21, No. 3. (February 2007) p271

<sup>56</sup> Johan Galtung, 'Violence, Peace and Peace Research', *Journal of Peace Research*, vol 6, No 3, (1969) p171

*to directly attacking others, as when one person kills another."*<sup>57</sup>

He goes on to explain that structural violence is problematic in that it does not show as easily as personal violence. Indeed, when there is personal violence, the object of the violence perceives it and usually speaks out, whereas the object of structural violence may not perceive it as violence at all.

In many places, women wait in long bathroom lines whereas men enter and leave with ease, and this is considered normal. But it should not be. Because it is structural violence, we do not perceive it as violence at all, but rather a normal part of life. "There's a conditioning that happens to young women and children because people just accept [waiting in line for the bathroom] as just the way it is."<sup>58</sup>

Another reason for this complacency is our lingering cultural taboo around excrement. Women who have protested bathroom lines in the past have been ridiculed for the issue's triviality. In 1988, law Professor Taunya Banks wrote a feminist piece on toilet equity in the school paper and experienced outrage and scorn from students and professors alike. One student responded that he was "appalled to think that a fine publication like this would stoop so low as to publish such a completely nonsensical and tasteless article." Another student proclaimed that the article provoked "ridicule and astonishment that a tenured law professor doesn't have

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<sup>57</sup> Ibid.

<sup>58</sup> M. Bradley, "'Potty Parity' Aims to Remedy Long Lines", *Christian Science Monitor*, (January 19, 2006)

more serious causes to occupy her time and effort.”<sup>59</sup>

Considering the difficulties around the topic of toilets, one must wonder: how can we go about fixing this structural violence?

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<sup>59</sup> Taunya Lovell Banks, 'Toilets as a Feminist Issue: A True Story', 6 *Berkeley Women's L.J.* (1991) p266-7

## CHAPTER 5: PROPOSED SOLUTIONS

This chapter presents some alternative design solutions that go beyond what the current “Potty Parity” research suggests. Consider Stuart Brand’s model of *Pace Layers* as an analogy for how we can address this hard-to-fix problem effectively.

Pace Layers is a framework that explains how healthy societies evolve over time. It is a “many-leveled corrective, stabilizing feedback [system]”<sup>60</sup> that allows a society to evolve and adapt at an appropriate pace. When one of the pace layers is out of synchrony, problems arise.

Within the Pace Layers schematic, the upper layers move more rapidly than the lower layers. Thus, each layer has a different change rate. The interaction between successive layers acts a negative feedback loop, regulating the pace and advancement of its neighbors. Brand’s layers are Fashion/art, Commerce, Infrastructure, Governance, Culture and Nature.

Fashion moves quickly, and is non-linear, repeats itself and recycles quickly. Commerce evolves more slowly than fashion, but still quicker than Infrastructure. Nature, with its foundations in biology and the genome, moves at the slowest pace.

Brand gives several examples of how the Pace Layers schema works.

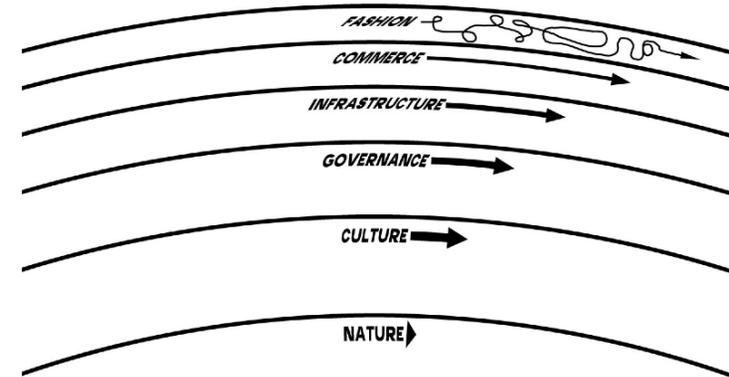


Figure 6: Stewart Brand's Pace Layers

*“If commerce [...] is allowed by governance and culture to push nature at a commercial pace, then all-supporting natural forests, fisheries and aquifers will be lost. If governance is changed suddenly instead of gradually, you get the catastrophic French and Russian revolutions. In the Soviet Union, governance tried to ignore the constraints of culture and nature while forcing a five-year-plan infrastructure pace on commerce and art. Thus cutting itself off from both support and innovation, it was doomed.”<sup>61</sup>*

When natural disasters like an earthquake occur (nature moving suddenly at a quicker pace), there is huge disruption in all of the other layers.

<sup>60</sup> Stewart Brand, 'Pace Layering: How Complex Systems Learn and Keep Learning', *Journal of Design and Science*, (2017)

<sup>61</sup> Ibid.

Keeping this systems theory in mind, let us return to the issue of the women's public restroom line. Most of the current proposed solutions have been at the governance and infrastructural layers. And even though change has begun at those levels, there is still much more work to do. Though many states in the US have neglected to pass "Potty Parity" laws, some such as California, Texas and Virginia have mandated that newly constructed buildings have a higher women to men's toilet ratio in each bathroom.<sup>62</sup> This change at the Governance level has induced the start of Infrastructural level change. In these states, newly constructed buildings are now required to have a 2:1 or 3:2 ratio of women's to men's toilets, depending on the legislation.

Infrastructural and cultural level change can be seen with female urinals at temporary events like festivals. Lapee's Founders, Gina Périer and Alexander Egebjerg, created a triple female urinal system that can be installed for short-term functions. It can operate either connected to or independently from a sewer system. It allows for minimal discretion and speed, two functions that are critical to keeping a toilet line short. This solution seems to work well for temporary use, but it has yet to be successfully incorporated into long-term infrastructure. Further research could answer why we have yet to see permanent solutions, akin to the Lapee, installed in populated areas such as sports arenas, theme parks, theaters, etc. An interview of the founders with Lapee was requested, but there was no response at the time of writing.

<sup>62</sup> Taunya Lovell Banks, "Toilets as a Feminist Issue: A True Story", 6 *Berkeley Women's L.J.* (1991) p274  
Anthony, K. And Dufresne, M. Potty Parity in Perspective: Gender and Family Issues in Planning and Designing Public Restrooms. *Journal of Planning Literature*, Vol 21, No. 3. (February 2007) p278

Figure 7: The Lapee Urinal



Another infrastructural level change was attempted in 1997 by Dutch designer Marian Loth. She proposed a permanent female urinal called *Lady P* for Royal Sphinx. Her model included small open-stall separations between urinals, creating a semi-private experience. The partial wall separations were designed to encourage rapid use, where a full wall might encourage people to take their time. However, when Royal Sphinx installed the urinals, they replaced the partial wall with a full cubical wall made of frosted glass. This design change defeated the purpose of the urinal because the walls needed to be touched by the user (to open and close) and they no longer encouraged the user to use the facilities quickly. Despite the media hype after its invention, Royal Sphinx discontinued the *Lady P* and removed it from the market.<sup>63</sup>

<sup>63</sup> A. Piccoli, 'This is Lady P', *Mediamatic*, <https://www.mediamatic.net/en/page/234343/this-is-lady-p>. (Accessed June 18, 2019)

Figure 8: The Lady P



At the commerce level, several companies have introduced portable urinary devices for commercial use. These devices such as the *Shewee* have been used at various festivals and have been adopted by the UK and US Armed Forces for their female personnel.<sup>64</sup> These devices allow women to urinate through a plastic funnel while standing. The advantage of this device is that the user can use male urinals. Additionally, women with jobs like a bus or taxi driver may use the funnel to urinate in a bottle, thereby avoiding the need to park and find facilities. Aside from the reported difficulty of use,<sup>65</sup> one wonders if this is another case of male-centered design. Indeed, all these portable devices emulate a penis. Furthermore, users must carry around a device that they pee in – a requirement many women will not tolerate.<sup>66</sup> In the case of the women’s bathroom line, this device does allow women to use male urinals.

<sup>64</sup> <https://www.glastonburyfestivals.co.uk/information/advice/toilets/> (accessed June 6, 2019)  
<https://www.shewee.com/about-us> (accessed June 6, 2019)

<sup>65</sup> A few websites have reviews comparing various female urinary devices ( all accessed June 6, 2019)  
<https://www.onlyreviews.com/uk/sports-outdoors/best-female-urinals>  
<https://www.well-beingsecrets.com/best-female-urinals-reviews/>  
<https://menstrualcupreviews.net/best-female-urination-devices-pee-funnels-reviews/>

<sup>66</sup> Ibid.

Figure 9: The Shewee



Lesser known interventions are beginning to occur at the Fashion level. California-based entrepreneur Anna Birkas invented Chickfly Pants—elastic pants like yoga pants, that have an opening at the crotch area, allowing females to urinate without removing their pants. Another brand, SheFly, makes a similar product in a cargo-pants style, marketing specifically to women who participate in outdoor trekking. Likewise, LadyHike has developed a special underwear and skirt combination that allows for the same freedom and modesty advantages that pants offer to men.

Figure 10: ChickFly pants



Figure 11: SheFly pants design

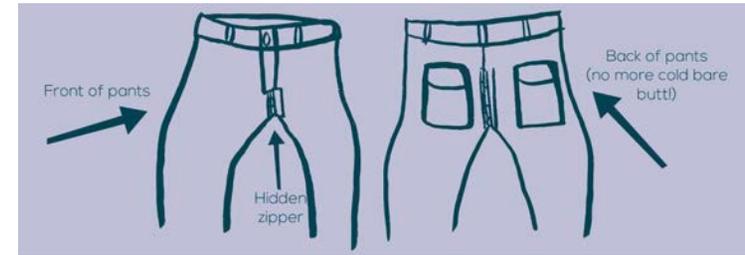


Figure 12: Petals underwear (with crotch opening) by Lady Hike



Of the commercially available solutions, these modified clothes make the most sense in terms of integration and ease of use. Unlike the Shewee which requires the user to carry around what is essentially a plastic penis, these fashion layer products will not cause a large disruption in the user's lifestyle. Further research should investigate whether already-made

clothing could be modified in a discreet manner to accommodate women's urination needs. Adding a zipper to regular pants in the crotch area could be advantageous when a toilet is not available.

All these options could likely improve the problem of the women's bathroom line. Given these clothing modifications, women could more rapidly use bathroom facilities, and could improve toilet access in a variety of situations. In big cities like London, Amsterdam and Paris, outdoor urinals are available for male use, but not female use.<sup>67</sup> This structural violence reinforces sexist perceptions like the need for female modesty or the lack of male accountability. Women already wear skirts; why is there not a similar fixture designed for squatting instead of standing?

If women's apparel were designed with functionality in mind, it would open the door for infrastructural layer improvement. We could not only build outdoor public urinals for women in wealthy Western countries, but it could also allow for safer relief in places where toilets are not available. As mentioned earlier, India is one of many countries in dire need of a solution for women who do not have access to toilets. If we could bring these types of clothing designs to remote locations without facilities, we could help save women from pain, medical problems like urinary tract infections and sexual assault. Furthermore, women in the armed forces could stop carrying around pee funnels and work with their natural anatomy.

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<sup>67</sup> Melissa Locker, 'Not Everyone is Thrilled About Paris's New Eco-Friendly Open-Air Urinals,' [time.com](https://time.com/5366560/open-air-urinal/) (August 14, 2018) <https://time.com/5366560/open-air-urinal/> (accessed June 12, 2019)  
BBC World News, 'Street toilets go telescopic', (Friday, November 1, 2002) [http://news.bbc.co.uk/2/hi/uk\\_news/england/2382831.stm](http://news.bbc.co.uk/2/hi/uk_news/england/2382831.stm) (accessed June 12, 2019)

Finally, there are two more layers to address: culture and nature. Consider a solution that bridges these layers. We theorize that men urinate while standing, whereas women while squatting or seated. But what if these are culturally dictated behaviors? Indeed, men can, and some do urinate while seated. I would propose that like men, woman can urinate while standing. It is the clothing (fashion) and learned posture (culture) that have determined our perception of these behaviors.

I conducted interviews with two women who can urinate while standing. One woman controls the stream by locating her urethra and directing it by separating her labia with her fingers. An online Wiki-how article goes into details of this method.<sup>68</sup> It requires some practice to master.

The second woman I interviewed bends forward and touches her toes. In doing so, her urethra points straight back, allowing for a stream control. When we met, she demonstrated this skill for me with confidence.

The first method requires practice and may be easier to learn as a child. The second however can be achieved fairly effortlessly. It could easily be taught to adults. Further research could test the effectiveness of combining these methods with products like Chickfly pants.

There is one last point to consider on the infrastructural level. One feature that differentiates the men's from women's room is the presence of stalls. If most of the stalls—i.e. the walls between the toilets—were removed in the women's restroom, it would create more space for toilets to be installed.

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<sup>68</sup> <https://www.wikihow.com/Urinate-Standing-Up-as-a-Female>, [wikihow.com](https://www.wikihow.com/Urinate-Standing-Up-as-a-Female) (Updated May 21, 2019) (accessed June 12, 2019)

The room could contain a couple stalls for activities requiring privacy, but leave the remaining toilets open, like Roman latrines. This may encourage speedier use and allow space for more fixtures. Thus, perhaps we are not in need of designing a new toilet, new pants or new urination skills, but in fact, just re-considering our relationship with privacy in the bathroom. Further research could confirm whether any of these conjectures hold true in helping the cause of the bathroom line.

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## CONCLUSION

The problem of the women's bathroom line is not an easy one to solve. It is a problem that is intertwined with cultural attitudes towards waste, privacy and discrimination. The lingering cultural taboos around excrement have made it even more difficult to progress. And while commerce, governance and infrastructural design can be a good start, they are not enough on their own. We must examine design elements at a holistic level. Using historical examination as well as a model such as the Pace Layers could facilitate redesign, as it allows designers to analyze the problem from multiple angles. This approach has led to several important conclusions.

First, we need to question why things are the way they are. We need to recognize that "man-made space encodes and perpetuates white male power and superiority and the inferiority and subordination of women and minorities."<sup>69</sup> As Leslie Weisman states:

*"the appropriation of space is a political act, [...] access to space is fundamentally related to social status and power, and [...] changing the allocation of space is inherently related to changing society."*<sup>70</sup>

In understanding how discrimination has impacted design, we can be motivated to find new ways of correcting problems. Like Judith Plaskow, we need to ask ourselves important

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<sup>69</sup> Leslie Kanes Weisman, 'Discrimination by Design: A Feminist Critique of the Man-Made Environment', (Urbana and Chicago: University of Illinois Press, 1992) p10

<sup>70</sup> Leslie Kanes Weisman, 'Discrimination by Design: A Feminist Critique of the Man-Made Environment', (Urbana and Chicago: University of Illinois Press, 1992) p1

questions like:

*"what would it mean for feminists to reclaim excretion in the way we have reclaimed sexuality? What would sanitary facilities look like in a world in which people were both comfortable with this aspect of embodiment and committed to enabling a maximum number of persons to participate fully in public life?"*<sup>71</sup>

Second, we need to reevaluate our relationship with privacy in the public space. As evident in the different public bathroom designs over time, there is nothing innate about our views on privacy. Men are socialized at a young age to use urinals in front of other men, and there is no reason why women could not do the same. Privacy is a luxury, but when resources such as time and space are limited, it should be one of the first things to go so as not to limit access for others.

Third, we need to re-evaluate our relationship with excrement. Our cultural squeamishness around waste is causing major problems on multiple Pace Layers levels. Flushing anything from medication and dental floss to tampons and condoms down the toilet is a major hazard for the sewage management systems; they are not designed to handle anything but toilet paper and human waste. As evident in the occurrence of the giant fatberg that clogged the London sewer system in 2017, or the millions of dollars that New York City has spent on unclogging problems with disposable wipes, people have a bad habit of flushing all kinds of things down the toilet. This has cascading effects not only for the cities, but for the environment as well. Scientists believe that flushed

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<sup>71</sup> Judith Plaskow, 'Embodiment, Elimination and the role of Toilets in Struggles for Social Justice', *CrossCurrents*, (2008) p52

contact lenses are contributing to the growing micro-plastic pollution in the ocean.<sup>72</sup> Indeed waste of all types is being mismanaged to an egregious degree and we must change our waste attitudes now.

Finally, we need to invest more in educating the public on toilet access, sanitation and waste disposal in both developed and developing countries. For both environmental and social justice reasons, it is time we have more public discussions about the repercussions that toilet use and design have on society. This open discussion is our key to designing a better world.

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<sup>72</sup> Amie Tsang, 'Sewer in London's East End Menaced by Giant Fatberg', *The New York Times* (September 3, 2017) <https://www.nytimes.com/2017/09/13/world/europe/uk-london-fatberg.html?module=inline> (accessed June 15, 2019)

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Preface Image: Long Ladies' Restroom Line. From the Guardian—Photo by Chuck Savage

<https://www.theguardian.com/lifeandstyle/shortcuts/2018/mar/21/why-women-face-longer-toilet-queues-and-how-we-can-achieve-potty-parity#img-1>

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