Facilitating Movement: Assessing the Adequacy, Accessibility, and Usability of Public Toilet Infrastructure

by Jonathan Paul Katz

Introduction: Not Everyone's Movements are Facilitated

It is driving rain, the weather is hovering near freezing, and I *really* need to pee. And, due to my sensory disability, when I need to go, the excessive pain means that I well and truly must go soon. As it happens, I am not at home: rather, I am travelling in another city. I scan the busy streetscape, looking for a potential respite. I spot a branch of a well-known fast fashion brand. I duck inside to ask if there is a customer bathroom. There is one on the second floor, and I make my way there. But as I ascend the staircase, I think about why the cashier was so unbothered to indicate, without even glancing at me, where the restroom was. I am white, young, a cisgender male that presents as a man, speak English with a native accent, am dressed in clean clothes (including the brand's own sweater), and my disabilities are invisible. Likewise, my homosexuality is not always "identifiable." I do not have children, a cart of possessions, or needle scars with me. Furthermore, it is plausible that – although this time, I buy nothing – I may be a customer, who may linger over and eventually purchase a set of somber-colored socks or another quaint librarian sweater. These privileges grant me access. And, when I reach the bathroom, I can use it. Though I grimace at the untidiness, and nearly slip and fall on the tile surface, I am able to make my way to a urinal and do my business without too much worry, and mercifully, the urinal does not "splash" back like so many others. I can enter the bathroom, use it without much trouble, and leave. And even then, I have spent fifteen minutes on this simple errand.

I tell this story not to elicit sympathy, but rather to say that this is a case of bad and unjust planning. I needed to execute an extremely basic life function, albeit with more urgency than many others may have. Instead of availing myself of a readily usable facility, I had to take a circuitous route, pretend to be a customer at a facility, and ask for access. Even then, my ability to enter and safely use the restroom – again, an extremely basic life

function – was only enabled by my intersecting privileges, and the relative invisibility of my marginalized experiences. For women, people of color, other disabled people, other queer people, homeless people, caregivers for children, and older people, among others, additional identities act as further barriers for restroom access. And, in a dominion where restrooms are not planned for, this overarching barrier is an example of a deeply unjust city: even basic life functions are not possible.

Significant planning scholarship in recent years has focused on Susan Fainstein's conception of the "just city," an equitable, democratic, and diverse polity that enables its residents to thrive (S. Fainstein, 2005; S. S. Fainstein, 2010). Her concept is based on Martha Nussbaum's concept of developing capacities: a political focus on ensuring that citizens and community members have the ability to do basic functions and pursue individual and shared goals (Nussbaum, 2000). These ideas have been varyingly cited for developing "diverse" cities, multicultural cities, or more resilient cities (Fincher, Iveson, Leitner, & Preston, 2014; Qadeer, 1997; Sandercock, 1998; Zukin, 2010). Yet little planning literature, and few planners professionally, have considered the importance or relevance of public toilets.[1] Despite design guides and academic studies by Clara Greed, Barbara Penner, Olga Gershenson, Harvey Molotch, Peter Baldwin, Kirsten Berg, and others, research on planning for bathrooms – especially in the context of "justice" – remains relatively small despite the essentially universal implications for sanitation (Baldwin, 2014; Berg & Lämmle, 1997; Gershenson & Penner, 2009; Greed, 2003, 2009; H. Molotch, 2010; H. M. H. Molotch, 2018; Penner, 2013). The lack of research is also astounding given the implication for worker rights in the Global North and international concern for sanitation in the Global South (George, 2008; Greed, 2009; Linder & Nygaard, 1998; Noren, 2010). Similarly, despite the appearance of books for

[1] This lack of consideration, more broadly, is also applicable to the failure to assess disability in planning literature, especially that around justice. See (Hamraie, 2017; Serlin, 2010; Williamson, 2019).

lay audiences on sanitation and toilet access by Rose George, Lezlie Lowe, and Francesca DiPiazza – and the significant media attention on the shortage of public toilet infrastructure in the United States, Canada, and Europe, few planners or government agencies consider toilets in their day-to-day work (Berg & Lämmle, 1997; Chess, Kafer, Quizar, & Richardson, 2008; DiPiazza, 2015; Fracassa, 2019; George, 2008; Kasza, 2007; Lowe, 2018; Pyzyk, 2017; Rundfunk, 2018; Saxena, 2019; Washington, 2014).

I argue that regular, equitable, and adequate access to usable restrooms is necessary for the achievement of a just city. In this essay, I will first outline why public toilets matter, and examine why it has not been a central concern of many planners, followed by a brief outline of public bathroom access in the United States and Canada. Then, I will examine the way intersecting identities and experiences influence how we use the bathroom. "Everyone poops,"[2] but "everyone poops" with different needs, and with different abilities to do so at various times and places. To illustrate this, I examine some case studies of public restrooms in the United States and abroad and show how they fall short of providing equitable access.

To remedy access, I propose a set of flexible indices to assess the adequacy and accessibility of public toilet infrastructure in a city, on a campus, or in a region. The index addresses tangible, technical concerns, as well as social matters and the planning of restrooms. In the index, I do not create a full index for assessment – as that, I will note, needs to be done and adjusted on a case-by-case basis. Rather, I examine the questions that must and may be considered in a variety of contexts relating to how, when, and where different people use restrooms. Finally, I make suggestions as to developing and incorporating indices and planning for public restrooms in the creation of just cities in which everyone's movements are facilitated.

[2] Cited in various children's books, but for reference, I cite (Gomi, 1993).

Toilets: Flush with Importance, But Rarely Plunged by Planning

Most people must use the bathroom several times a day, primarily to urinate, defecate, or attend to menstruation. Averages for this need vary significantly across the population. In general, they are higher for women than for men, higher for children and older adults than younger adults, much higher for people with digestive illnesses than other people, and higher for those who are pregnant (Brubaker & McCreary, 2007; George, 2008; National Institute on Aging, 2008). The provision of facilities and infrastructure for safe elimination and disposal of waste is considered a key aspect of the development of countries and to maintain public health (Brubaker & McCreary, 2007; George, 2008; Greed, 2003; Han & Choi, 2014; H. Molotch, 2010; Phadke, Khan, & Ranade, 2011; Phaswana-Mafuya & Shukla, 2005). Indeed, many planners identify the elimination of cholera through Joseph Bazalgette's planning of sewers for London as the "birthplace" of the profession. (Greed, 2003; Penner, 2013). Similarly, sanitation infrastructure is identified as the starting point for planning in German cities (Berg & Lämmle, 1997). Beyond preventing illness, public toilets have particular benefits. As I shall outline later, our use of the toilet is mediated by our bodies, genders, ethnicities, classes, sexualities, and disabilities. For some people, the availability of safe, reliable bathrooms enables their ability to participate in public space.

Almost every scholar that studies toilet provision notes that being able to use a public bathroom is, essentially, tacit approval for presence in a space. If you cannot do the most basic life functions in a place, and do not have the assigned space to do so, it means that the space is not meant for you. Or, you can do neither "Number One" nor "Number Two" if you should not be there in the first place. This point has been noted with women (Anthony & Dufresne, 2007; Banks, 1991; Greed, 2003, 2009; Phadke et al., 2011; Plaskow, 2008; Poggiali & Margolin, 2017), people of color (Baldwin, 2014; Banks, 1991; Cooper & Oldenziel, 1999), disabled people (Cahill & Eggleston, 1995; Hamraie, 2017; Molenbroek, Mantas, & Bruin, 2011; Plaskow, 2008; Serlin, 2010), children and their caregivers (Chen, 2000; Filce &

LaVergne, 2015; Lundblad, 2005; H. Molotch, 2010; Penner, 2013), students and blue-collar workers (Baldwin, 2014; Linder & Nygaard, 1998; Noren, 2010; Poggiali & Margolin, 2017), and older people (Bichard, Knight, & Greene, 2010; Greed, 2009; Hanson, Greed, & Bichard, 2004; Penner, 2013). Recent media attention on the needs of transgender people and gay people is matched by academic interest in the subject, including detailed efforts to assess the safety of bathrooms for these populations (Chess et al., 2008; Edelman, 1996; Gershenson, 2010; Gershenson & Penner, 2009; Herman, 2013; Sanders, 1996; Serlin, 2010). Homeless people, without regular access to a toilet, have also had their inadequate toilet access assessed by media, but less by academia (George, 2008; Ho & Kehn, 2007; Kushel, 2018; Lowe, 2018; Robinson & Sickles, 2015). The availability of toilets can and does dictate movement for these populations, and the ways it does so will be highlighted later in this paper. The problem is, though, that North American cities severely lack toilets. This fact was the *Leitmotif* for the foundation of *Facility,* a magazine about public bathrooms, in 2019 (Sheehy, 2019). I will go into more detail shortly, but I want to preface the plunging of that history with a note about planning.

Several reasons explain the lack of attention to public bathrooms by planning. First, the topic has been politically unpopular for decades now. Government policy in the United States and Canada has actively sought to dismantle public bathrooms since the 1960s, and toilets have been seen as dens for drug dealing and illicit sexual practices (Baldwin, 2014; Barcan, 2010; Berg & Lämmle, 1997; DiPiazza, 2015; George, 2008; Greed, 2003; Lowe, 2018; H. Molotch, 2010; H. M. H. Molotch, 2018; Penner, 2013). Planning, meanwhile, has historically sought to be reactive and moderate in the context of constrained political possibilities – foreclosing the possibility of subverting these norms (S. Fainstein, 2005;

Sandercock, 1998).[3] Secondly, the taboos around urination, defecation, and menstruation are among the strongest in Western and other cultures. This taboo has been shown to carry into other professions, and planning is likely no exception (Barcan, 2010; Chess et al., 2008; Kira, 1976). This taboo is likely why many architects and planners consider bathroom design and sewer planning as "the lowest" work, despite their wide-ranging implications, an irony noted by Alexander Kira in his widely celebrated study of bathroom and toilet design, *The Bathroom* (George, 2008; Greed, 2009; Kira, 1976; Penner, 2013).

Finally, planning has historically been dominated by white, male, abled, cisgender, middle-class men who were not caregivers – exactly the combination of categories least impacted by access to toilets. Clara Greed, perhaps the world's most prominent scholar of toilet access, notes that this lack of attention is not only reflected in the dismissal of toilets as unimportant, but has become part of architecture and planning's socialization of what is considered important work, and what is not (Greed, 2003). Yet planning affects every aspect of everyday life. Harvey Molotch, another scholar with a long history of toilet papers, notes that "toilets…perform the city" (H. Molotch, 2010, p. 11). Indeed, the city is made up of thousands or millions of residents, all of whom need to use the restroom, and only some of whom can wait until they get home. It is their experiences that I shall now turn to, by discussing the history of public bathrooms in the United States and Canada.

A History of Elimination: Public Bathrooms and Who Can Use Them

The history of public toilets in the United States and Canada is long and deeply intricate; such an analysis would cover entire pieces, not just several sentences. Indeed, Peter Baldwin, Taunya Lovell Banks, Judith Plaskow, and Harvey Molotch have authored or

[3] There are almost certainly planners and policy-makers who have taken heroin in a park toilet or cruised public bathrooms for sex. The ubiquity of the latter activity until recently in the United States is quite astounding, see (Edelman, 1996; Sanders, 1996; Sheehy, 2019).

edited articles or volumes on the precise topic (Baldwin, 2014; Banks, 1991; H. Molotch, 2010; Plaskow, 2008). This history is a brief summary.

Public bathrooms were not commonplace in the United States or Canada until the late 19th century, when increased concern about sanitation and public health adjusted elimination habits among the population more generally (Baldwin, 2014; Greed, 2009; Lowe, 2018; Penner, 2013). Social reformers in the 19th and early 20th centuries sought to build public conveniences in order to provide better sanitation for working-class populations and people travelling through the city, and to "reform" subjects' hygienic practices (Baldwin, 2014; George, 2008; Greed, 2003; Kira, 1976; Penner, 2013). Even then, restrooms for women and people of color attracted significant opposition, in no small part because constructing them was considered to encourage women's participation in public life outside the home, or the presence of people of color in a space conceived of as "white" (Baldwin, 2014; Banks, 1991; Cooper & Oldenziel, 1999; George, 2008; Greed, 2003; Lowe, 2018; H. Molotch, 2010; Penner, 2013).[4] The unusability of many public bathrooms was often a concern, particularly for older people and disabled people, as well as women, contending with toilets designed by men with little knowledge of female anatomy or needs that come about from menstruation (Hamraie, 2017; Kira, 1976).

This impact extended beyond World War II, after which designs for facilities were based on military data sourced from abled, white, cisgender men (Cahill & Eggleston, 1995; Hamraie, 2017). These designs also did not account for different habits in the bathroom, reactions to public elimination, and the mechanisms by which people accommodated themselves (and each other) in public restrooms – a point noted and accounted for in Alexander Kira's design work (Greed, 2003; Kira, 1976; Penner, 2013).

[4] Similar debates have been recorded in Germany and the United Kingdom. See (Berg & Lämmle, 1997; George, 2008; Herman, 2013; Linder & Nygaard, 1998; Lowe, 2018).

Yet public bathrooms were widely available. Some bathrooms required a fee to use – a fact and access barrier that inspired activism by women and people of color in the 1960s to end pay toilets (George, 2008; Plaskow, 2008). Fewer were available for women, and in many states, public restrooms were segregated (Anthony & Dufresne, 2007; Banks, 1991; Cooper & Oldenziel, 1999). Most were inaccessible for disabled people, and this lack of access proved to be a major organizing point for the disability rights movement (George, 2008; Hamraie, 2017; H. Molotch, 2010; Penner, 2013; Serlin, 2010). However, restrooms were provided in parks, transit facilities, public spaces, and on streets to a degree unseen today (Greed, 2003). Rest stops and facilities there were a key part of the expansion of highway systems in the United States and Canada, as well as railway stations and subway systems (Brubaker & McCreary, 2007; George, 2008; Greed, 2003; Jaffe, 2013; Lewis, 2013; Perrier, 2009; Washington, 2014).

A significant portion of public bathrooms were closed in the 1960s and 1970s. Cost was often cited as the up-front reason. Public restrooms cost money to maintain, and the outlay for building, maintaining, cleaning, and staffing restroom facilities were often a significant line item in public works budgets – even though the costs were miniscule compared to, say, the building of roads to newly constructed suburbs (Baldwin, 2014; Brubaker & McCreary, 2007; Linder & Nygaard, 1998). In addition, fear was stoked about the use of restrooms for illicit activity. A significant cruising and cottaging culture existed in men's restrooms, where closeted men solicited anonymous and not-so-anonymous sex away from society's gender norms (Barcan, 2010; Edelman, 1996; Gove, 2000; Sanders, 1996). Drug use and sex work in bathrooms was also considered a "threat" (Berg & Lämmle, 1997; Penner, 2013). As a result, thousands of public bathrooms across the United States and Canada were permanently closed in the 1960s and 1970s (Baldwin, 2014; Brubaker & McCreary, 2007; George, 2008; Greed, 2003; Jaffe, 2013; Linder & Nygaard, 1998; Lowe, 2018; H. Molotch, 2010; H. M. H. Molotch,

2018; Noren, 2010). No exact estimate exists, but I consider Clara Greed's calculation for the United Kingdom – of at least 40% of public restrooms since 1970 (Greed, 2003, 2009) – as a reasonable, albeit conservative estimate for the level of closure in North America. Furthermore, many of the remaining restrooms are extremely unclean, badly maintained, and are regularly closed. Quite possibly, more than half of restrooms have been closed.

Today, most "public" restrooms are what Robert Brubaker aptly terms "publicly accessible" restrooms, located in the commercial venues like coffee shops, malls, and lobbies that are "open," but privately owned (Brubaker & McCreary, 2007; George, 2008). Indeed, Starbucks is often referred to as the public bathroom for New York City and other Northeastern metropolises (Holder, 2018; H. M. H. Molotch, 2018; Noren, 2010; Saxena, 2019; Sheehy, 2019). Many of these bathrooms require purchases or codes for entry. I assume the reader has availed themselves of such facilities at some point.

The impact of these closures and shifts in provision, of course, already impacts passage through a space when one needs to eliminate or is menstruating. But this lack of access is deeply mediated by intersecting identities, and the elimination of facilities for elimination is a metaphorical clog for some groups more than others. Later in the paper, I will use the proposed index to show how to address these multifaceted barriers. But illustrating this mediation here is proof that the closure of public restrooms – and the reliance on home and business facilities – has disproportionate impact, on access to and usability of restrooms, and movement generally.

Entry to restrooms is mediated by gender, class, race, disability, age, and caregiver status. Much of the past attention on this topic has focused on the lack of facilities for women, particularly in office buildings, universities, and other traditionally male-dominated spaces (Banks, 1991; Gershenson, 2010; Gershenson & Penner, 2009; Greed, 2003; Penner, 2013). Women usually have to urinate more often than men, and take longer to do so; the

shortage of women's toilets and the comparative lack of available facilities compared to men causes long lines and waits or bathroom avoidance that may contribute to incontinence[5] (Anthony & Dufresne, 2007; Banzhaf III, 2002; George, 2008; Greed, 2003, 2009; Lowe, 2018). In addition, menstruation necessitates additional restroom visits that are not only more difficult, but are not accommodated in terms of the design of infrastructure or availability of facilities for disposal of menstrual products (Anthony & Dufresne, 2007; Fox, Silva, & Rosner, 2018; Greed, 2003, 2009; Kira, 1976; Penner, 2013). Scholars now argue that, for equitable access, two times as many bathrooms must be provided for women as for men (Anthony & Dufresne, 2007; Banzhaf III, 2002; Greed, 2003; Penner, 2013). Such difficulties are compounded for transgender and non-binary people, who often cannot safely use gendered restrooms, and who often wait long times for access to safe facilities, with long-term health effects (Gershenson, 2010; Herman, 2013). Race plays a role, too: people of color are less likely to feel comfortable patronizing businesses only to use the bathroom, and are often actively prevented from doing so (Banks, 1991; Cooper & Oldenziel, 1999; Greed, 2009). Indeed, the two men infamously arrested in a Philadelphia Starbucks in 2018 were there to use the restroom (H. M. H. Molotch, 2018).

For people of all genders and races, class is also a barrier. Many poor people are unable to afford the small purchases necessary for toilet access; in addition, many blue-collar professionals such as taxi drivers and delivery people are not permitted to use "customer" restrooms; indeed, many are not allotted bathroom breaks at all (Linder & Nygaard, 1998; H. Molotch, 2010; Noren, 2010; Saxena, 2019). Homeless people are regularly barred access to bathrooms; over 80% in Denver report having been denied bathroom access (Robinson & Sickles, 2015). As a result, many are trapped in a cycle of lack of access, inability to clean oneself, and visible poverty that continues to stymie restroom access; many are also forced to

[5] For more on urinary incontinence, see (National Institute on Aging., 2008).

relieve themselves outdoors, a practice risky for both health and policing (Barragan, 2018; Fracassa, 2019; Ho & Kehn, 2007; Holder, 2018; McKenna, 2019; Pyzyk, 2017; Robinson & Sickles, 2015; Sanchez & Villareal, 2019).

Public restroom access is impacted for people with visible and invisible disabilities. Many facilities are simply inaccessible for people with mobility disabilities or blind people; even if the restroom or toilet itself is accessible, the path there is not (Cahill & Eggleston, 1995; Dahreddine, 2019; Hamraie, 2017; Hanson et al., 2004; Molenbroek et al., 2011; Serlin, 2010; Thummalapalli, 2019a; Toy, 2019). The relative lack of public toilets poses significant difficulties for people with chronic digestive illnesses, cognitive disabilities, and colostomies in finding an entering a bathroom in time (George, 2008; Greed, 2003, 2009; Hanson et al., 2004; Lowe, 2018; Serlin, 2010; Sheehy, 2019). Many of those disabilities are tied to the aging process. Aging also increases the frequency of and intensity of need for urination (Bichard et al., 2010; Greed, 2003). Children, too, have limited capacity to find and navigate to public restrooms, especially at a young age. Parents often expend significant energy and mental labor in finding an appropriate public restroom for children (Filce & LaVergne, 2015; George, 2008; Lowe, 2018). This pattern is paralleled for people with disabilities and elderly people accompanied by caregivers (Cahill & Eggleston, 1995).

Once in the restroom, design also affects users differently across gender, class, ethnic background, disability, age, and caregiver status. The difficulty of cleaning public bathrooms is often a result of poor design; the resultant unhygienic standards add additional impact to all of the following situations (George, 2008; Kira, 1976; Pernice, 2019). Toilets, urinals, sinks, and stalls have historically been designed around the norm of a white, abled, adult male body wearing typical men's clothes (Kira, 1976; Mullick, 2001). Women and transgender people must often engage in additional physical effort to use the toilet at all, and often do not have enough room to do so in a stall. Additionally, the design of many toilets makes

urination difficult for many women, as the seat pattern does not compliment the flow of urine from women's urethras (Kira, 1976). Facilities for the disposal of menstrual products are often unavailable or absent; when they are available, are unclean or unusable (Chess et al., 2008; Greed, 2003). Inadequate washing facilities particularly impact homeless people, who often rely on public toilets for basic hygienic actions (Robinson & Sickles, 2015; Sanchez & Villareal, 2019). Surfaces matter, too. The use of "reflective" surfaces in many public toilets increases the likelihood of urine splashing back onto the user (George, 2008; Greed, 2003; Kira, 1976). This fact, compounded with the lack of menstrual product disposal and washing facilities, renders many public toilets unusable for Muslim and Hindu people, as well as members of many other ethnic groups, for whom bodily purity is a necessity for entry into sacred or community spaces. The impact is extended should water not be available for cleansing after defecation, a requirement by Islamic law (Ali, 2012; Greed, 2003; Kira, 1976).

The design of toilets usable by people with disabilities is well-established by legal and professionally accepted access standards. These are stipulated by the Americans with Disabilities Act and local laws in the United States, and other regulations elsewhere[6] (*ADA Checklist for Existing Facilities*, 2016; Molenbroek et al., 2011; Mullick, 2001; Williamson, 2019). However, these laws are frequently flouted, and design mishaps frequently render nominally accessible bathrooms temporarily or permanently unusable (Cahill & Eggleston, 1995; Hamraie, 2017; Hanson et al., 2004; Lurye, 2018; Molenbroek et al., 2011; Serlin, 2010). Often, the offending situation is not a toilet or sink, but rather, the doors to enter, surface levels, or poor lighting (Ban & Fink, 2017; Bichard et al., 2010; Chess et al., 2008; Greed, 2003; Lowe, 2018; Penner, 2013; Thummalapalli, 2019b; Toy, 2019). The lack of counter space and usable lighting especially impacts people with colostomy bags or who use

[6] International standards for public toilet accessibility, and for accessible facilities more generally, are now largely based on those developed in the United States. See (Hamraie, 2017; Williamson, 2019).

bathrooms to administer insulin or medication; both situations require hygienic spaces, places to put items, and clear lighting for vision (Greed, 2003; Mullick, 2001). Single-user stalls are essential for millions of people with paruresis, or "shy bladder syndrome," who find difficulty in using toilet stalls or urinals (Brubaker & McCreary, 2007; Soifer, 2019).

Such failures not only impact the usability of bathrooms by disabled people, but by elderly people as well. Bathrooms and stalls are often not large enough to accommodate a caregiver, who may be a necessity for a disabled person, elderly person, or child to use the toilet (Cahill & Eggleston, 1995; Greed, 2003; Molenbroek et al., 2011; H. Molotch, 2010). For children, toilets and sinks are often impossible to use without assistance, given that they were designed for adults (Greed, 2003; Kira, 1976; Lowe, 2018). The lack of diaper change facilities also hampers toilet usability; many parents report engaging in unsafe or trepidatious situations when changing their child, particularly in men's' rooms that still often lack changing tables (Anthony & Dufresne, 2007; Greed, 2009; Lowe, 2018). A lack of garbage cans can have similar impact.

This mediated access has disproportionate impact when it comes to movement through urban public space. A significant number of women, older people, and disabled people, especially people of color and those with incontinence or chronic illness, base their travels significantly on the availability of accessible and usable public bathrooms (George, 2008; Pernice, 2019; Plaskow, 2008; Washington, 2014). The lack of public toilets has been posited to impact walkability and transit use, especially among those who already suffer from the lack of public restrooms (Greed, 2003; Jaffe, 2013; Pyzyk, 2017; Washington, 2014). Many caregivers for children, mostly women, plan journeys around the availability of restrooms (George, 2008; Lowe, 2018). Transgender and non-binary people do similarly (Gershenson & Penner, 2009; Hanson et al., 2004; Plaskow, 2008). The movement of homeless people – especially homeless people of color – is severely restricted by where and when bathrooms can

be accessed, if at all (Robinson & Sickles, 2015; "NAEH," 2018). Many people with shy bladder syndrome or anxiety disorders plan travels completely upon access to usable bathrooms (George, 2008; Herman, 2013; Lowe, 2018; Penner, 2013). In order to facilitate movement throughout the city, and within a just city, it is necessary to facilitate movements of other kinds.

Several municipalities in the United States and Canada, in light of these concerns, have planned and constructed public restrooms in public spaces. Some have targeted homeless populations specifically, while other programs have been more open. A few have been modeled on programming elsewhere. I shall now describe these efforts, with an eye to their failures to address certain needs.

Rolling Out Public Toilets: Annapolis, Denver, Portland, Santa Monica, Kassel, and Seoul

In this section, I will discuss several examples of the installation and maintenance of planned, public toilet infrastructure in five cities. This list is by no means comprehensive; dozens of examples have been noted around the world, from Tokyo to London to recent examples in Washington, D.C. (George, 2008; Greed, 2003; Holder, 2018; Kasza, 2007; Lowe, 2018). The decline and subsequent reinstallation of public toilets in Germany has attracted significant public debate in local media, much of which is not referred to in English-language restroom studies (Berg & Lämmle, 1997; Kasza, 2007; Rundfunk, 2018; Vetten, 1983).[7]

Many international examples in the Global South are aimed at people with no home sanitation or home toilet, as is common with famed initiatives in India and South Africa (Appadurai, 2002; Felix, 2013; George, 2008; Phadke et al., 2011; Phaswana-Mafuya & Shukla, 2005; "Things that make India proud," 2012). These initiatives, primarily aimed towards slum

[7] Linder and Nygaard's excellent study of workplace bathroom breaks, *Void Where Prohibited*, cites the German-language literature extensively. Berg and Hämmle, like Greed, directly implicate the planning profession in examining the shortage of public toilets, using the city of Kassel as their example (Berg & Lämmle, 1997). Swiss efforts, bolstered by a shared language, often build on this literature (cf. Stamberger, Hartmann, & Brunner, 2015).

dwellers in a context of infrastructure deficits in the Global South, are complex enough to necessitate a separate paper; the aims of such projects, in providing daily sanitation to residential areas, are also sufficiently different.[8] The projects listed here, four in the United States and one in South Korea, provide public toilets in industrialized economies in the public spaces broadly described by other scholars, such as Clara Greed and Jo-Anne Bichard, as "away-from-home" (Bichard et al., 2010; Greed, 2009).

I shall now describe, in turn, these initiatives in Annapolis, Denver, Santa Monica, and Portland in the United States, and Seoul in South Korea.

Annapolis, Maryland

The shortage of public toilets in Annapolis was considered to be a major impediment to the movement of travelers through the tourist-dependent harbor city. In response, the City opened a toilet at the Harbormaster's building, originally meant for boaters, to tourists on a 24-hour basis in 2012. The toilets, originally open seasonally, are now available year-round. Use of the toilet has increased sharply in recent years. The bathrooms are staffed and monitored. Showers and laundry are also available for boaters ("Capital Gazette," 2012; *Harbormaster*, 2019). This twenty-four hour facility is highly unusual in the United States, where many public toilets close during "non-business" hours (Bernbaum, Olivar, McDermott, & Sharp, 2018; George, 2008; Holder, 2018; Lowe, 2018; Robinson & Sickles, 2015; Sanchez & Villareal, 2019). Many of those with most impacted needs – such as low-income workers with late schedules, homeless people, and tourists far from home – benefit from the hours and

[8] Indeed, public bathrooms do provide most or all basic sanitation for many homeless people. However, the conditions of homelessness and of slum residence in the Global South, despite intersections, are different. So, too, are the policy measures needed. Public restrooms should be able to provide for homeless users, but are not a substitute for long-term housing, support, and assistance programs for people experiencing homelessness. Likewise, public toilet schemes such as the South African government's initiative to provide toilets in townships and the Indian *Sulabh Shauchalaya* program are not intended to substitute for long-term housing and sanitation provision, but rather to complement it. See (Appadurai, 2002; George, 2008; "NAEH," 2018).

open availability. However, the bathrooms are not well-advertised, and many Annapolitans are unaware of their existence; the city website lists the restrooms, which are open to all, as part of the facilities for boaters ("Capital Gazette," 2012; *Harbormaster*, 2019). In addition, information about the accessibility of the facilities for disabled people and children is not made available, and no gender-neutral restrooms are available (*Harbormaster*, 2019).

Denver

The lack of public restrooms in Denver and other cities of the Mountain West has had a particularly disproportionate impact on the region's large homeless population, many of whom have reported health problems, soiling themselves, or being forced to defecate or care for menstruation outdoors (Garrison, 2018; Kenney, 2017; Pyzyk, 2017; Robinson & Sickles, 2015). Other residents also complained about the lack of public restrooms and the resultant impact on their movements (Kenney, 2017). The Denver municipal government initiated a three-pronged strategy to build additional public bathrooms: reopening extant facilities in municipal buildings and parks, with advertising; the creation of mobile facilities that would travel to regular locations; finally, the evaluation of locations for long-term public restroom installation (*Denver Public Restrooms*, 2019). Toilets are staffed and supervised by city employees (*Denver Public Restrooms*, 2019; Pyzyk, 2017). The response to the facilities has largely been positive; homeless people have particularly benefited from regular, allowed access to facilities. The gender-neutral facilities also benefit transgender residents (Garrison, 2018; Pyzyk, 2017).

However, the restrooms are not available for 24 hours, and do not have aligned opening times, rendering access especially difficult for homeless people who rely on them, and challenging also for low-income workers and other late-night travelers. Both situations have been cited as problematic for bathroom access in past studies (Hanson et al., 2004; Lowe, 2018; Robinson & Sickles, 2015). Though some facilities are accessible, the design of the mobile facilities renders – according to my estimation from the Denver Public Works

website – access for people who require attendants especially difficult, because the facilities are cramped. This impact is similar for people travelling with young children. Finally, mobile facilities are limited in size, and are rarely able to meet large volumes of need. Similar difficulties have been noted with mobile facilities in San Francisco (Fracassa, 2019; Schneider, 2018).

Santa Monica

For reasons similar to Annapolis, the city of Santa Monica installed permanent public restrooms on its famed pier in 2007. The facility was especially designed to be evocative of Santa Monica's seaside location and architectural history; the staffed restroom contains both toilet facilities and external sinks. Reaction to the restrooms has been largely positive, and especially appreciated by the city's many disabled residents and visitors from throughout the Los Angeles region (*Pier Central Restroom Renovation*, 2018; *Downtown SM*, 2019; Toy, 2019). The external sinks are likely useful for Muslim visitors conducting ablutions (*wudu*), Orthodox Jews washing hands before eating bread, and for the other roughly 35% of bathroom users who use a restroom for purposes other than elimination (see Kira, 1976). However, the bathrooms are only available from 6 am to midnight (*Downtown SM*, 2019). The location of the restrooms in a historically white, wealthy area may detract from the bathroom's usability for people of color, who might feel unsafe or unwelcome in the facility. Finally, the gendered restrooms are not helpful for transgender visitors, and the "equivalent" provision of men's and women's toilets will not lead to equitable access for women (cf. Greed, 2003; Plaskow, 2008).

Portland

Portland, Oregon's citywide public toilet scheme has attracted considerable support from city residents, and is celebrated by some architects, planners, and the city government itself (Metcalfe, 2012; *The Portland Loo*, 2019). The design is pre-fabricated, creating a replicable public bathroom across the landscape (*The Portland Loo*, 2019). Sixteen have been

placed in high-traffic areas (Lowe, 2018). The restrooms are all-gender, single-user, and wheelchair accessible; they are regularly maintained and cleaned (Metcalfe, 2012; Washington, 2014). Sinks are external to the toilet room; inside the facility, there is no running water (*The Portland Loo*, 2019). Grates let in outside air and light, which is seen as a deterrent to crime (Metcalfe, 2012). Some claim that this effort has "solved" the public toilet provision issue (Metcalfe, 2012).

Portland has not solved the problem. The lack of running water is a major impediment to a host of restroom users. People who use the restroom to care for menstruation, a key elimination function, are unlikely to use a restroom without running water. If they use a cup or other non-tampon mechanism, the restroom may even be unusable without a sink (Greed, 2003; Kira, 1976; Mullick, 2001). Similarly, for people with colostomies or who administer medications, a bathroom without running water is too unhygienic for use (Greed, 2003; Lowe, 2018; Sheehy, 2019). Muslim users cannot defecate in a Portland Loo, given that the water .people with paruresis from using the toilet (Brubaker & McCreary, 2007; Soifer, 2019). The explicit reason for the exclusion of water and the inclusion of the grates is to prevent drug users or homeless people from using the bathroom (Metcalfe, 2012). But denying high-need populations bathroom access through design is not a feasible solution, especially given the public health impacts. Portland's solution is stylish, and a start, but a markedly incomplete movement.

Seoul

South Korea, along with Singapore and Australia, is one of the few industrialized countries with a comprehensive public toilet strategy (George, 2008; Han & Choi, 2014; *The National Public Toilet Map*, 2019). The national government has invested in the provision of public toilets for thirty years, and particularly since the passage of a law mandating minimum levels of provision across urban areas in 2004 (Han & Choi, 2014). Tens of thousands of public toilets are now available across the country, particularly in the Seoul metropolitan region,

home to roughly half of the country's population (Han & Choi, 2014; Park, 2019). The restrooms are gender-segregated; many are accessible for people with disabilities. Many of the restrooms are provided as part of the Seoul Metropolitan Subway's gargantuan network (Han & Choi, 2014). However, the bathrooms are not always stocked with basic supplies; the recent lack of toilet paper and waste bins for the disposal of tissue, tampons, and diapers sparked public outcry (Park, 2019). The gendered restrooms are not only an impediment to transgender and non-binary people and opposite-sex caregivers: a recent scandal in South Korea sparked from the illicit, non-consensual videotaping of women in public restrooms (McCurry & Kim, 2018). This trauma has not been implemented in men's restrooms. Though Seoul's network of public restrooms is among the world's most extensive, there is clearly much work to be done in ensuring the safety and usability of these facilities.

Notes

These five systems were installed with the best of intentions. Yet these, and likely most other, systems still have gaps in provision, safety, and usability for already-impacted sectors of the population. Measuring the usability of a toilet system for a population whose varied genders, ethnicities, disabilities, faiths, classes, ages, and statuses affect their restroom use is difficult indeed. In the following section, I begin the process of outlining a set of indices to conduct such a measurement, for more complete and facilitated movement in public restrooms.

The Assessment Index

I propose this tool as a way to find out where public toilet infrastructure is lacking, in what ways it is lacking, and as a starting point for how best to correct it, or build new infrastructure as necessary. Most extant indices were developed for campuses or specific populations (cf. *ADA Checklist for Existing Facilities*, 2016; Ban & Fink, 2017; Case, n.d.; Chess et al., 2008; Mullick, 2001; Poggiali & Margolin, 2017). While other comprehensive measures exist, for example, those proposed by Clara Greed (2003) and Alexander Kira

(1976), both focus primarily either on the technical or the policy measures of toilet policy. I believe that both are necessary to consider. This index assesses if:

- public restrooms are planned for, funded, not bound by social barriers, and free or low-cost;
- public restrooms are accessible across disability, age, genders, and culture;
- public bathrooms are stocked and clean;
- public bathrooms are safe with attending staff; and
- that no one is too far from a public bathroom when they travel in public spaces.

The index presented here is not a detailed, item-by-item checklist. Rather, it is a series of questions and matters that should be considered when assessing a set of public restrooms in a municipality or on a campus. These ideas and questions are sourced from the literature cited prior. Given that different communities have different populations with different toilet needs, it is imperative that the community is involved in the planning for and construction of these facilities (cf. Appadurai 2002, Greed 2003, Lowe 2018). This involvement, ideally, starts from the first axis I outline: the planning.

Planned For

Ideally, public restroom infrastructure should be considered immediately at the outset of any project – for example, the setup of a BID, the large-scale renewal of other public infrastructure such as transport, stations, or parks, or the planning of a new mixed-use development. For established areas, a planning matrix can and should be set up to install or reopen facilities, as applicable, in a given area. Restrooms should not be considered an enhancement, but a necessity akin to other public facilities. In planning, highest-trafficked areas should be prioritized, with travel time and distance (considered later in the index) to a facility set at a maximum. In an area with single-family residential zoning, it is unlikely that public bathrooms would be feasible for building; mixed-use, commercial areas, transect zoning, and industrial areas are almost certainly more feasible for planning. The inability to

provide for usable public space, by dint of public restrooms, itself could be an argument for doing away with single-family, residential-only zoning. In development review, especially for public facilities such as schools,[9] planners should consider a project or facility's restroom provision, and particularly that for women, transgender and non-binary people, disabled people, older people, and children. Numbers are important. Some suggest that one bathroom for every thousand people is a feasible number to aim for; when restrooms are gendered, additional restrooms should be provided for women (Brubaker & McCreary, 2007; Greed, 2003; Stamberger, Hartmann, & Brunner, 2015). As for other public facilities, communal input and involvement should be sought – within traditional mechanisms like hearings, surveys, or new and locally appropriate means.[10]

Planning agencies and offices should dedicate specific time for restroom provisions; in large enough jurisdictions or campuses, a full-time staff member or office may be necessary. Staffing on a part-time basis is also possible. Denver, Portland, Seoul, and Zürich in Switzerland all have dedicated professional staff administering toilet programs (*Denver Public Restrooms*, 2019; *The Portland Loo*, 2019; Han & Choi, 2014; Stamberger et al., 2015). This effort will require dedicated funding.

Funded

Funding is regularly cited as a challenge to the construction, upkeep, and long-term provision of public toilets. Municipalities in the United States, Canada, and Europe have closed such infrastructure due to lack of funds (Berg & Lämmle, 1997; Bichard et al., 2010; Klinenberg, 2018). Costs vary by country and labor market, depending on materials used, but toilet facilities can cost hundreds of thousands of dollars to maintain annually, and more to

[9] The inadequacy of restroom provision in schools deeply impacts the well-being of children, who often develop health problems from avoiding school restrooms. In many countries, girls miss school due to an inability to access usable facilities while menstruating. See (Filce & LaVergne, 2015; Lundblad, 2005; Plaskow, 2008; Talor, 2011).

[10] "Toilet festivals" (*sandaas mela*) in India offer a fascinating and very creative example from the Global South. See Appadurai, 2002.

construct and systematically staff (Lowe, 2018). Toilets are often among the first things locked or closed in public infrastructure during responses to funding reductions (Jaffe, 2013). As a result, planners for public toilets must consider funding.

Various funding mechanisms exist. Ideally, the tax base and tax revenue for a local or regional government should be used to provide simple municipal facilities; on a campus, revenue from tuition and other income can be used similarly. State and national tax money should be made available for the installation of restrooms, as proposed by the lobby group the American Restroom Association ("American Restroom Association," 2018; Brubaker & McCreary, 2007). Other local, state, and federal funds are usually applicable to restrooms. One example is restrooms on Hartford Line commuter trains in Connecticut, made available and then corrected for accessibility with federal subsidies for railroad travel (*CDOT*, 2018; Lurye, 2018; Marshall, 2018). Though restrooms should ideally be free, low cost payments can provide a small portion of operating expenses, though well-trafficked fee-paid restrooms rarely make enough money to cover true operating costs (Lowe, 2018). Traditional infrastructure mechanisms such as bonds, grants, and other public funds may be useful, especially for larger provision projects.

The private sector is a potential partner, though this aspect comes with risks. Businesses can be paid, as has occurred in London (Greater London Authority, 2004), to make their restrooms available to the public. However, guarantees for accessibility and usability are not enforceable with businesses; furthermore, small businesses likely do not have the staff or resources to maintain bathrooms for clientele beyond their customers. Efforts to pay for public restroom with advertising have met mixed success (Lowe, 2018). In some areas, Business Improvement Districts and publicly-owned private spaces have provided toilet infrastructure (H. Molotch, 2010; Noren, 2010; Penner, 2013). While this mechanism offers promise – given the ubiquity of these institutions – the concern remains that other barriers

may be erected by these groups to meet certain goals – while denying people bathroom access.

Without Barriers

Planners should consider the social barriers that prevent certain populations – such as people of color, homeless people, and people with children – from more easily using public restrooms. Addressing these barriers will need to be done, to some extent, on a case by case basis. At all policy levels, the needs of marginalized communities should be accounted for, and explicit conditions made that hinge funding or professional staffs' promotional opportunities on toilet usability by all community members. Staff will need to be trained and monitored to ensure that common discriminatory practices – particularly against already-vulnerable homeless populations – are not maintained. Private partners that provide public restrooms should have funding and partnership made contingent on the provision of public restrooms for all users. Federal law in the United States supports the precedent of "everyone must have access"; a recent case in Connecticut in which all train bathrooms were closed due to their inaccessibility is an example (Lurye, 2018). Given the disparate impact of closure on women, children, and people with digestive conditions, closure as a punishment should be discouraged. So, too, should payment for public restrooms.

Free or Low Cost

The reliance on businesses to provide "publicly-accessible restrooms" (Brubaker & McCreary, 2007) has a major impact on poor people, people of color, and homeless people, who may not be read as a "customer" when using a "customer-only" toilet (Lowe, 2018; H. Molotch, 2010; H. M. H. Molotch, 2018; Saxena, 2019). Many people cannot afford regular "small" purchases to use a toilet. Indeed, pay toilets were abolished for this reason. Thus, public toilets should be made free whenever possible. This freedom of cost extends to barring other mechanisms – for example, the toilet-opening smartphone apps now required in some public bathrooms in San Francisco (Kukura, 2019). Barriers reliant on possessing expensive

technology are still barriers by cost – and also impact other users such as older people, who may not be familiar with technology, and children.

In some cases, it may not be politically feasible to install or provide free toilets, as was the case in Zürich and other European cities (Berg & Lämmle, 1997; Greed, 2009; Lowe, 2018; Stamberger et al., 2015). In this case, providing bathrooms for the lowest possible nominal fee should be the main strategy. Separate programs should be in place at the municipal level to ensure that these fees do not block access by homeless people – for example, Toronto's provision of tokens to use its new public facilities (Lowe, 2018). The practice of providing free urinals but requiring payment for commodes, common in the United Kingdom and India (George, 2008; Greed, 2003; Phadke et al., 2011), is discriminatory by sex, gender, ability, and religion. It should not be done. Payment, if instituted, should be identical for urinal users as for anyone else.

Accessible Across Disability

Disability access indices are well-established in architecture and engineering, and cover a range of accessibility needs (*ADA Checklist for Existing Facilities*, 2016; Ban & Fink, 2017; Greater London Authority, 2004; Mullick, 2001). These lists, when followed, can produce broadly accessible facilities. However, they are often not followed or improperly followed, which disparately impacts the disabled people who depend on these standards for basic access. Following these guides, and consistent enforcement, is a key part of any toilet strategy. Furthermore, legal actions often impact disability access. Obstructions should be removed or moved whenever possible to ease access by wheelchair, as well as items on grab bars and trip hazards that may affect blind and low-vision users. In my own experience informing people of regulations around disabled bathroom access, I have found that obstructions and trip hazards are regularly forgotten.

Other issues affect disabled users' experiences in toilets as well. Lighting, sound, and ventilation can cause difficulty: if any is too strong, it can trigger migraines or difficulty seeing or hearing, but poor lighting and ventilation can make bathrooms difficult or even dangerous for people with vision disabilities or asthma (Mullick, 2001). Slippery surfaces are difficult for many low-vision and blind people to navigate safely. Complex flushing mechanisms are difficult for people with cognitive disabilities to use; where possible, the simplest method should be provided. Signage reminding users to flush the toilet and wash their hands serve as helpful reminders for people with cognitive disabilities. In multi-stall bathrooms, a seat for people waiting for a stall to open is helpful for those with mobility disabilities. Stalls should be large enough for people to navigate in with a wheelchair, and another person if they require an attendant. Mirrors and sinks should not only be at the legally required height, but also reachable from the vantage point of a wheelchair.

It should be noted that the availability of bathrooms at all is a disability justice issue for people with digestive conditions, diabetic people, and people with colostomies. Regular and frequently available bathroom access effectively facilitates movement in public space for these populations. In this vein, it is important to consider the needs of those with colostomy bags or people with diabetes who may administer insulin, and anyone administering a medication (cf. Greed 2003). Clean counter space and garbage cans should be provided in all bathrooms, and clear lighting to allow for hygienic administration as needed. Many users may feel most comfortable doing these activities in single-user stalls.

Accessible Across Age

Beyond disability, age is also an important factor to consider. Older people not only use the bathroom more frequently than others, but also often require technical accommodations that arise from age-related disability, such as grab bars, step-free access, and easily reached controls. Many older people plan their away-from-home travel on the

ability to access restrooms while out (Bichard et al., 2010; George, 2008; Hanson et al., 2004; Washington, 2014). Plans should account for the limited mobility and frequent needs of older residents, and should make additional efforts to plan for toilets in communities with many older residents. Needs that arise from age-associated disability should be incorporated into accessibility checklists, and relevant laws followed. Many local associations of senior citizens offer technical advice; wherever possible, this should be sought.

Access matters for the youngest citizens as well. Diaper change tables and garbage cans for diaper disposal should be made available in as many public restrooms as possible. Bathrooms should also be wide enough to accommodate strollers; this point is often ignored by architects and restroom designers (cf. Lowe, 2018). In larger facilities, child-height toilets and sinks should be provided; models commonly used in schools and daycares are usable by adults and children alike. Signage in the restroom, such as reminders to flush and wash one's hands, should be illustrated and easy to understand for children, particularly those who are only just learning to read or cannot read yet. To aid parents accompanying children into restrooms, single-user restrooms and stalls should be large enough for a parent and child to maneuver comfortably. This need can easily be covered by room to maneuver with a wheelchair and will also benefit other users as well.

Accessible Across Genders

Bathrooms have historically been designed with a male, abled user as the norm, with disastrous consequences for women (cf. Greed, 2003; Hamraie, 2017; Penner, 2013). Women often have the experience of waiting much longer for inadequately provided restrooms, in stalls where women's clothing is difficult to remove, with no consideration for the disposal of menstrual items. Public bathroom schemes should account for women's increased need for urination facilities relative to men, and the additional needs visited by menstruation. If gendered bathrooms are provided, the ratio of two women's toilets to every men's toilet

should be provided ("potty parity") to provide equitable access (Anthony & Dufresne, 2007; Banzhaf III, 2002; Lowe, 2018). This reflects the fact that women use the toilet more often and use it for a longer period of time. Disposal facilities for menstrual items must be provided – either through closed garbage cans or, if desired, separate mechanisms. Many women feel more comfortable using single-user facilities for menstrual needs. Stalls should be wide enough for women to maneuver with their clothing as needed. Finally, many toilets are designed assuming male patterns of elimination; the choice of toilets should reflect women's biological layout as well.

Trans and non-binary users face particular difficulty as well, and may not be able to safely use gendered toilets even if legally allowed to do so, with staff. Non-gendered or single-user toilets should be provided whenever possible to enable access, and specific provision should be made in consultation with local communities of transgender people. Menstrual product disposal and tampons should be provided in men's rooms, and design interventions made for women's rooms should be made for men's rooms. Staff who attend to restrooms should be trained in gender equity issues and safety issues for trans and non-binary clients.

Gender equity may be greatly enhanced by removing urinals, which enables all users to be on an equal footing when using public restrooms. Given that urinals are unusable by many men, equity may involve reducing urinal use.

Accessible Across Cultures

Restroom use is culturally mediated. Muslim and Hindu users may wish to use a *lota* or water bottle to wash after defecation; many religious Muslim, Jewish, and Hindu men will not use a urinal to urinate (Ali, 2012; George, 2008; Greed, 2003). These practices reflect religious practice in these communities. For members of these and other communities, splash-back from toilets onto clothes can present problems regarding purity and the ability to enter

sacred spaces. For Muslim men, the ability to wash feet before prayer (*wudu*) is also something that may take place in a bathroom, as is ritual hand-washing for Orthodox Jews before eating meals with bread. Design for public restrooms should take these varied needs into account. Small stalls can prevent the effective use of a lota, and over-reliance on urinals in men's rooms can present other difficulties. In addition, women from certain religious practices cannot share toilet facilities with men outside the family during certain times, or ever (Greed, 2003). Providing women's restrooms – or restrooms barred to men - in large public spaces may be necessary.

Additionally, non-religious impacts may also come into play. Customary clothing in many communities is difficult to remove or put on in small spaces; toilet stall design may not be optimal for certain garments. Hooks and shelves to store clothing and items must be considered with this difficulty in mind. Widening stalls may help in usability. In some countries, men are socialized to sit when urinating; relying on urinals alone is not efficient in this case (Berg & Lämmle, 1997; George, 2008).[11] In addition, people in some countries are socialized to wash their hands before and after toilet use, as are workers in certain "messy" industries (Kira, 1976). Sinks, soap dispenser, and paper towel provision should be made accounting for this fact.

Stocked

As any user can attest, public bathrooms require a host of accoutrements for usability. These include toilet paper and paper towels for cleansing, tissues as needed, hand dryers, garbage cans for the disposal of items – and separate disposal for menstrual products if expected or required, and soap. The provision of tampons and condoms in public bathrooms is a highly effective public health measure, and can improve the well-being of many visitors who

[11] These practices are not of ancient origin either: in Germany, signs and other encouragement for men to sit when urinating is a postwar phenomenon. See (Berg & Lämmle, 1997).

are experiencing “period emergencies” or unexpected incidents related to menstruation (Frank, 2019; Greed, 2003). Public restrooms frequently lack even basic items such as toilet paper; this lack is a main reason these facilities are so often avoided even when available (George, 2008; Kira, 1976). Programs to install public bathrooms should ensure that the availability of items is continuous and reliable in all facilities. Checks may take the form of a list, a daily review, or automation should time, energy, physical characteristics and finances allow.[12] Information on who to contact if an item is not stocked should be made readily available to users.

Clean

The cleanliness of bathrooms is a universal issue, and I am sure the reader has some horror stories too. Unclean public bathrooms are a main reason extant facilities are not readily used; they also pose a public health risk to users (Brubaker & McCreary, 2007; Greed, 2003; Kira, 1976; Phaswana-Mafuya & Shukla, 2005; Stamberger et al., 2015). Planners addressing public restroom provision must consider how and how often public restroom facilities are cleaned, and mechanisms to continuously monitor the cleanliness of bathrooms. This effort will require staffing, addressed later, as well as planning for resources and closure times. Design interventions should be made to ensure that the bathroom is easy and quick to clean – for example, surfaces that do not cause fluids to stick (Mullick, 2001). Posters reminding users to flush the toilet, use garbage cans, and wash their hands have proven useful in many public bathrooms (George, 2008; Greed, 2009; Kratzke, Short, & San Filippo, 2014; Park, 2019; Stamberger et al., 2015). Asking users to sit to urinate, though unlikely to be universally followed, can also aid cleanliness by preventing urine splatter (Berg & Lämmle,

[12] For a study on automatic provision of essential supplies in restrooms, see (Fox, Silva, & Rosner, 2018).

1997; Kira, 1976; Kratzke et al., 2014). For urgent matters, plungers, toilet brushes, and garbage cans should be provided in all restrooms.

Safe

Many users do not feel safe in bathrooms, and ensuring that restrooms remain safe is a lasting difficulty (Baldwin, 2014; Greed, 2003; Herman, 2013; Lowe, 2018; H. Molotch, 2010; Noren, 2010; Robinson & Sickles, 2015). Cameras are, obviously, not an option. In order to ensure safety in the bathroom, the usability and durability of locks must be ensured. Locks should be regularly checked to ensure they work. Staffing for larger public facilities is essential, and contact information for emergency services should be provided. Restrooms should also not be hidden behind trees, bushes, or in circuitous paths; ideally, Clara Greed's proposal for a clear sightline from a bathroom entrance or exit to a main area should be followed (Greed, 2003). Marginalized communities at risk in restroom facilities, such as transgender people and homeless people, should be consulted – as done at the University of California, Santa Barbara (Chess et al., 2008). Allowing children to accompany parents into bathrooms, regardless of the child's gender, also ensures children's safety in the often-secluded space of the restroom (cf. Lowe, 2018). Staffing for bathrooms provides a constant eye to safety that many users find beneficial. Safety protocols should consider the working conditions and risks to employees as well.

Staffed

The staffing of restrooms ensures multiple points of access and usability. Of course, janitorial staff clean and maintain bathrooms, and by extension do important public health work that is under-appreciated and generally underpaid (George, 2008; Linder & Nygaard, 1998). Attendants in larger public bathrooms are able to monitor the goings-on and general safety of a facility, especially in public areas; this approach has shown to be of benefit for users' comfort and facility cleanliness in the United States, Europe, and Korea (Berg & Lämmle, 1997; Greed, 2003; Han & Choi, 2014; Pyzyk, 2017; Stamberger et al., 2015; Toy,

2019). Many women, disabled people, and transgender people feel markedly safer in attended facilities (Lowe, 2018; Penner, 2013). That said, bathroom attendants historically played a role in segregating bathrooms for people of color and homeless people (Banks, 1991; Cooper & Oldenziel, 1999); monitoring would need to ensure that this practice is not repeated. Staff can play a particular role in the case of an emergency: bathrooms are accident-prone spaces, and are often used in the prelude to a medical emergency (Bichard et al., 2010; George, 2008; Greed, 2003; Kira, 1976). These responsibilities have often fallen on already-taxed service staff when incidents occur in business' restrooms (H. Molotch, 2010; Saxena, 2019; Sheehy, 2019).

Staffing strategies will differ by municipality, campus, and even facility. The monitoring of many facilities, such as those in parks, libraries, community centers, and social infrastructure can be done in tandem with other provisions. Staff there – and particularly janitorial staff that regularly interact with customers – would benefit from more sustained training. Larger public restrooms, such as those in train stations, buses, and large parks, would likely benefit from dedicated attendants, as was common in the early 20th century (Baldwin, 2014). Some bathrooms intended for historically marginalized populations, such as homeless people or older people with disabilities, will need particular training for the staff to respond to specific concerns.

In all cases, fair pay and working conditions are incredibly important. Work in and around restrooms has historically been heavily stigmatized and extremely underpaid (Brubaker & McCreary, 2007; Chess et al., 2008; George, 2008; Greed, 2003; Penner, 2013). The proximity to urine, feces, and blood also pose certain risks to the workers without adequate precautions. Plans should address paying workers a living wage with adequate benefits, providing safe working conditions and the materials that create them[13], regular

[13] Gloves, masks, detergents, etc.

checks on working conditions, and opportunities for workers to provide input for their and clients' benefit. These opportunities should be made available especially to members of communities for whom the bathrooms are intended. Similar efforts have already been made in Chinese cities to significant success (Gong, 2015; Zhang, 2018). Information on how to contact staff should be made readily available to users.

Not Distant

Finally, public bathrooms should not be distant from where people actually are, public space. A metric of ten minutes' travel or five hundred meters (approximately 1/3 of a mile) is a good starting point. That distance is a rough measure of how willing many people are to travel to basic services. Korea's toilet law mandates no more than five hundred meters distance from any urban point to public facilities,[14] and Zürich aims to provide approximately two toilets for every square kilometer (George, 2008; Stamberger et al., 2015). More toilets may be necessary in heavily trafficked areas, or places where travel is slow due to incline or complex routes. All buildings that provide public buildings should have public restrooms. In addition, public infrastructure such as train stations, large bus stations, bus and light rail termini, subway stations, libraries, and community centers, as well as parks and playgrounds, should have dedicated restrooms whenever possible. On campuses and in other institutional districts, a bathroom should be provided in every public building.

Conclusion: A World Flush with Possibility

A just city is one filled with chances and opportunities for all those who inhabit it: to live, to thrive, to be, and to move. Residents have the capacities to pursue their daily lives, enabled by the state, communal, and informal planners that build and maintain these spaces. This world, flush with possibility, is enabled by the availability of public restrooms. For any capacity to be feasible, basic life functions like elimination and washing must be enabled.

[14] This goal has not yet been fully achieved in suburban areas of South Korea.

This index is one step towards enabling that goal. However, it is very much not the final step. Continued iterative processes are needed to design, build, maintain, and monitor public restroom index. One such step is to create a far more detailed, technical index – a project that could easily be book-length.[15] However, this index will need to take into account the limited capacities many planners have – much less the communities who should be involved, from the start, in planning for public restroom provision. In future work, I intend to create a more detailed technical index covering the various metrics I outlined here.[16]

Public restroom provision will also need to take into account other aspects of planning. People do not live or go to the bathroom in siloes – but they do often plan in isolation. Community involvement, detailed cultural, ability, and gender considerations, safety analysis, and connections to other systems will make public restroom provision more effective long-term – and by extent, other planning mechanisms that enable the capacity of city denizens.

Two potential points of intervention are transport systems and libraries. In the former case, the dissolution of transit system bathroom networks has had an undue impact on the usability of trains and buses by marginalized communities (Greed, 2003; Jaffe, 2013; Penner, 2013; Washington, 2014). This fact persists despite the fact that many stations actually have bathrooms in their facilities already (Brubaker & McCreary, 2007; George, 2008; Jaffe, 2013). Reopening, renovating, and properly maintaining transit bathrooms would be a boon to riders' well-being, even if ridership does not increase as a result. Libraries, meanwhile, often act as "social infrastructure" in communities and on campuses, providing services well beyond books and resources. This role extends to public bathrooms (Klinenberg, 2018; Poggiali & Margolin,

[15] Indeed, many extant analytical tools and indices for restroom design and provision run to hundreds of pages.

[16] I am currently working on a draft technical index to assess the usability specifically of restrooms on the University of Maryland-College Park campus. At the time of writing of this paper, the index was under review by several stakeholders.

2017). Library staff often are under-resourced or cannot provide bathrooms to meet the needs of patrons and neighborhood passerby. Programming to provide staff, funding, and technical changes to library restrooms could be a launchpad for a larger program. These two proposals are merely ideas in a realm of possibilities.

What does a city with ample, adequate restroom infrastructure look like? I will return to my initial story to offer a hypothetical example. Before leaving the house, or travelling to the city, I would have known about the existence of public restrooms in major areas. When I realized I needed to go, I would be able to walk into a freely accessible public restroom that was easy to find. I would not need to pay or worry about whether or not it was clean. Walking inside, I would find various facilities that made it accessible for someone with a wheelchair, say, a small child, or who needed to dispose of a tampon. These things would be visible to me, even if I did not use them. I would not worry about if there would be toilet paper, a garbage can, or soap: they would be there. Finally, I would be able to direct anyone I knew to it, and know that they could use it, and not go through a rigmarole just to pee.

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