



INCLUSIVE RESTROOM DESIGN GUIDE

A Comprehensive Analysis of Inclusive & Gender Specific Restrooms in K-12 Schools



CUNINGHAM
G R O U P

Thank you to Saint Paul Public Schools for guidance in the design of inclusive restrooms and allowing access to survey students and staff for their opinions, which are critical in shaping the future of school restroom design, particularly:

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ABSTRACT

The design of public restrooms has long been a contested territory for civil rights issues and policy debates of the time. Currently, segregated facilities, which were created to prevent discrimination on the basis of gender, are increasingly coming under scrutiny by the LGBTQ community, as they fail to recognize the non-binary nature of gender and create social difficulties for members of the transgender community.

While ongoing conversations and laws continue to evolve at the state and federal levels, very little data regarding the implementation and logistics of inclusive bathrooms, or bathrooms which are non-gender specific, exist at the K-12 level. In much of the United States, school districts recognize the issue but do not have the information readily available to address it. The intent of this research is to provide a brief understanding of the pending 2021 ICC codes, which include both building (IBC) and plumbing (IPC) codes, which allow for inclusive restrooms and the implications for K-12 schools, and serve as a guide to obtaining approval of an alternative code-compliant design, using the key components of the design of inclusive restrooms, prior to the 2021 ICC codes' adoption. (Note: the intent of the code compliance section of this research is to provide a case study, based on the 2015 Minnesota State Building Code, which incorporates the 2012 IBC and IPC. This research does not guarantee approval of the case study design by any particular building official.)

In addition, this study includes a comprehensive analysis of gender specific and inclusive restrooms designed by Cuningham Group Architecture from 2012-2017 as well as enumerates key design components of inclusive restrooms.

Lastly, this research includes data taken from a case study at Johnson High School in St. Paul, Minnesota, which includes a survey, administered to the students of Johnson High School who have been "living" with inclusive restrooms for the past two years to understand which elements of the design contribute most to their feelings of safety and security.

Access to bathrooms is a basic human right. They matter and their design matters. While the programming and look of schools is dramatically changing, bathroom design has remained largely the same.

It is time to rethink the design of bathrooms to be inclusive, for everyone.

The design of public restrooms has long been a contested territory for civil rights issues and policy debates of the time. A century and a half ago, only the wealthy had access to private in-home toilets (Transgender Law Center 2005). The rest of the population relied primarily on chamber pots and unhygienic public restrooms. After a cholera epidemic during the Civil War, people began to re-evaluate public sanitation policies, and the provision of public restrooms became commonplace (Ball 2015). Perhaps the most vivid restroom civil rights battle in the United States' cultural consciousness is that of the Jim Crow era in response to separation of facilities by race. Another prominent civil rights victory impacting restroom accessibility was the Americans with Disabilities Act. However, the civil rights victory that has the most impact on this study can be traced back to 1887 Massachusetts state law that went into place mandating sex-segregated public restroom facilities. This was viewed as a progressive measure at the time, as women were beginning to enter the workforce and often faced discrimination in workplace restroom availability (Miller 2016).

These gender segregated facilities, which were created to prevent discrimination on the basis of gender, are increasingly being scrutinized by the LGBTQ community, as they fail to recognize the non-binary nature of gender and create social difficulties for members of the transgender community.

Population studies estimate that between 0.5% and 2% of the population have strong feelings of being transgender, and that at least 0.5% of the population has taken some steps toward transitioning their gender (Gates 2011). In one of the most comprehensive surveys of the United States' transgender population, a notably high rate of discrimination was reported in a variety of settings and forms. 78% of transgender people reported being harassed at school by students, teachers or staff, while 35% reported being physically assaulted and 41% reported attempting suicide at some point in their life (Figure 1).

Additionally, "Respondents in all educational settings also reported denial of access to essential gender-appropriate facilities, such as bathrooms (26%)" (Grant, et al. 2011, 35, 36, 84). An exploratory study investigating the impact of this discrimination finds that it can result in increased withdrawal from public life, and health problems associated with bladder infections and distress.

Harassment and Assault in K-12 Settings by Region

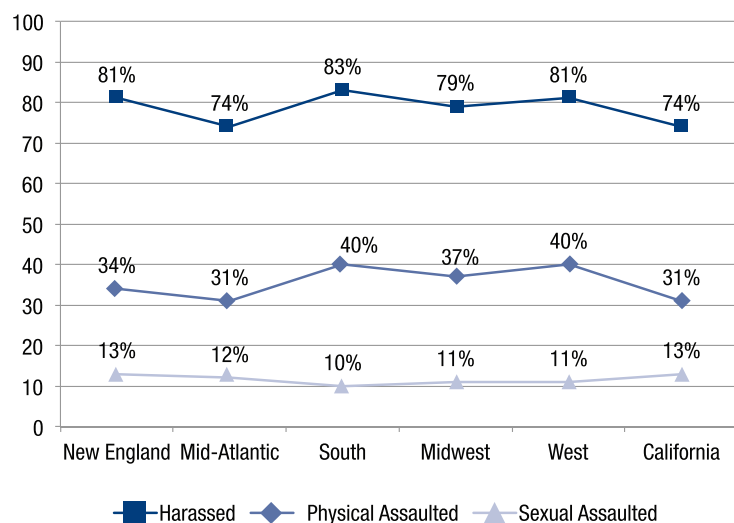


Figure 1 Harassment and Assault in K-12 Settings by Region (Grant, et al. 2011, 36)

It has been shown in previous studies that minority stressors of this kind can result in mental health impacts in addition to the behavioral and physical (Herman 2013, 77).

The complications created by gender segregated restrooms can be illustrated by this quote from writer and activist Jacob Tobia:

"If I choose the women's restroom, I risk facing panicked women who take one look at my facial hair and assume that I'm a predator. If I choose the men's restroom, I risk facing transphobic men who, with one glance at my dangling earrings, begin hurling slurs or throwing punches." (Tobia 2017)

It's because of these fraught social circumstances that legislation has been enacted in nearly 20 states that prohibits gender discrimination in all public spaces, including bathrooms (Miller 2016). These laws are intended to allow transgender individuals to use whichever bathroom most closely aligns with their gender identity. However, these well intentioned laws have not gone unchallenged. They have resulted in legal challenges and counter-legislation such as North Carolina's House Bill 2, which mandates that an individual must use the restroom associated with the gender on their birth certificate. Laws of this nature are commonly justified by a concern that allowing biologically male individuals into women's rooms will increase instances of sexual misconduct and assault against women (The Case Against Fully Shifting to Gender Neutral Bathrooms n.d.). This civil rights battle continues today and its conclusion is not yet clear.

HISTORY OF RESTROOMS: THE GENDER SEGREGATED ISSUE (CONTINUED)

What is clear are the implications this battle has on the architectural profession. The argument taking place explicitly involves a component of the built environment that is heavily regulated by code and whose design has been firmly in the realm of the profession for centuries. While many architects may choose to remain on the sidelines of this debate, acting only as building code dictates, it's not entirely clear that this approach would be professionally ethical. The AIA Code of Ethics E.S. 1.5 states:

"Design for Human Dignity and the Health, Safety, and Welfare of the Public: Members should employ their professional knowledge and skill to design buildings and spaces that will enhance and facilitate human dignity and the health, safety, and welfare of the individual and the public." (AIA: Office of General Counsel 2017)

When the research into discrimination faced by the transgender community is taken into consideration, it is reasonable to claim that the current status quo of multi-occupant gender segregated public restroom facilities is not a solution that enhances and facilitates human dignity, health, safety, or welfare of 1.6–6.5 million Americans. (Worldometers 2017).

Architectural responses to this problem have been advocated for by activists over the last few decades. Initial efforts to increase access to inclusive restrooms put forward a range of solutions. Typically having at least one unisex restroom was viewed as an acceptable minimum (Stringer 2009) (Transgender Law Center 2005). More recently however, advocates view a small number of gender neutral single-occupant restrooms to be insufficient. While these single-occupant spaces ameliorate the issues of selecting a gender segregated space, it spatially segregates a trans person into the category of "other".

A Solution: access to multiple unisex restrooms, or the Inclusive Model

The solution commonly advocated today is the most extensive architectural intervention in the initial call for inclusive restrooms and multiple-occupant gender-neutral spaces. OSHA suggests that the best policies for workplace restrooms are "single-occupancy gender-neutral (unisex) facilities; and use of multiple-occupant, gender-neutral restroom facilities with lockable single occupant stalls" (OSHA 2015). The latter spaces were uncommon in the early aughts but have become increasingly commonplace in restaurants, bars, and mixed-use developments. There is clearly demand for this type of space, as illustrated by the open source website REFUGE Restroom (Refuge Restrooms 2017) which allows users to search, enter information, and rate inclusive restrooms in a geographical area.

In addition to relieving the complications of a gendered space for those in the trans community, this multi-occupant configuration would also benefit parents who would like to accompany their oppositely gendered child into a public restroom and would aid people with disabilities who are accompanied by an oppositely gendered attendant (Stringer 2009). While multi-occupant inclusive restrooms have successfully broken into the restaurant, bar and retail industries (Cordell 2016) (Miller 2016), they're not yet common in large institutional spaces.



Figure 2: Rendering of Inclusive Restroom Design at SPPS Humboldt High School

There are several key design components that separate inclusive restrooms from their gender segregated counterparts. The following section enumerates these key design components with a case study of the inclusive restrooms designed at both Saint Anthony Park Elementary and Humboldt High School. Saint Anthony Park Elementary is a grades K-5 Elementary School, while Humboldt High School is a grades 6-12 secondary school within the Saint Paul Public School District. Once completed in 2020, all restrooms throughout each facility excluding those in locker rooms, will be inclusive. Recently, Saint Paul Public Schools (SPPS) adopted a policy to eliminate gender segregated restrooms wherever possible. (Verges 2017)

Inclusive restrooms are single-stall restrooms providing universal services to all. Like at home.

Inclusive restrooms look and feel different than their gendered counterparts, the key design differences are:

- Location, Visibility, and Openness
- Full Height Walls, Doors, and Hardware
- Mechanical, Electrical, and Plumbing
- Cost

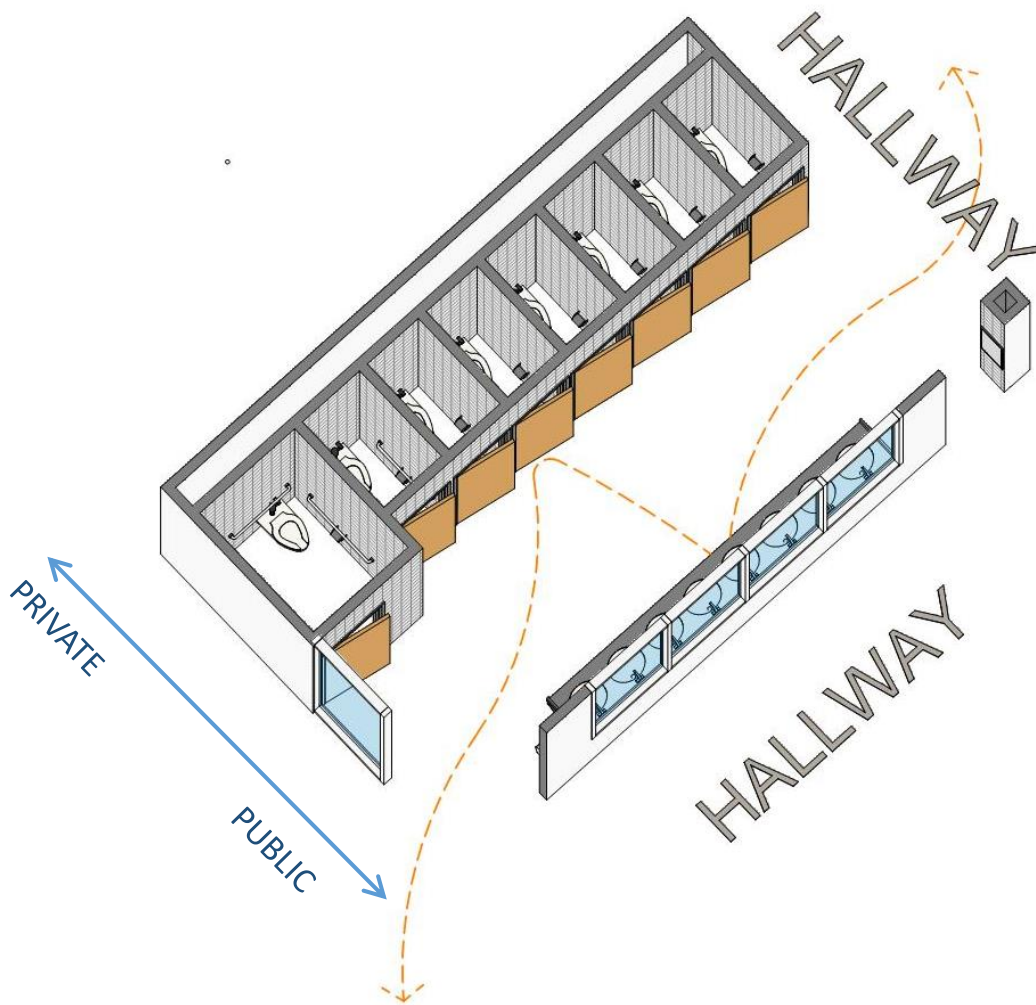


Figure 3: Axonometric Drawing of Inclusive Model at the middle / high school grades. Inclusive restrooms are designed to be highly visible and open, while maintaining privacy.

LOCATION, VISIBILITY AND OPENNESS

Perhaps the most obvious difference between inclusive and gender segregated restrooms is its visibility and openness.

The location of inclusive restrooms within the school should be purposeful and located on as many circulation paths as possible to allow for passive security. As a condition to approval of these restrooms at Humboldt High School, the code officials directed the design team to locate the restrooms in highly visible locations. The rationale is that bullying or discouraging behavior will be less likely to occur, as many eyes will monitor activity. Additionally, since the restrooms are open to the hallway, security cameras can be located for additional monitoring at the handwashing area.

Another condition of approval was to locate as much visibility through the restrooms, including visibility above the sink area. In order to provide some sense of privacy, while maintaining visibility, full height glazing was placed to one side of the restroom as it faces the corridor. This also provides a safe area for doors to open and close without risk of hitting passersby in the adjacent hallway. To increase safety, false columns with mirrors on two sides were located to increase visibility and prevent pedestrian accidents around the open corners.

It is important to note that visibility above the handwashing area was intentionally differentiated between the elementary school at Saint Anthony Park and the middle / high school at Humboldt High School. At the elementary school model, a half high wall contains the handwashing area in lieu of glazing above the handwashing area (see Figure 4). This provides more monitoring for staff at the elementary level and an increased sense of privacy for older students at the middle / high school level.



Figure 4: Inclusive restrooms are designed with full height acoustic partitions, photo of SPPS St. Anthony Park Elementary School.

FULL HEIGHT WALLS AND DOORS + HARDWARE

Because the inclusive restrooms are designed to be open and visible to passersby, it is important to maintain a sense of privacy at the toilet compartment itself. With this model, full height acoustic walls separate each compartment, as well as full height doors separating the compartment from the common hand washing area.

At Saint Anthony Park Elementary and Humboldt High Schools, each vertical surface of the restroom is designed with full height tile. For maintenance, the doors were specified to be high density plastic laminate (HDPL) with galvanized hollow metal frames. For additional privacy, the doors were specified to have only 1/4" undercut, whereas typical doors allow for 3/4" of undercut (or the open area under the door).

It's also important to note that the hardware on these doors is different than even a typical unisex restroom, in that the door closer is set to keep the door open 10 degrees when not in use as well as an occupancy indicator on both sides of the door. Together, these two items make it easy for students and staff alike to know whether a compartment is occupied and secured or open and available for use.

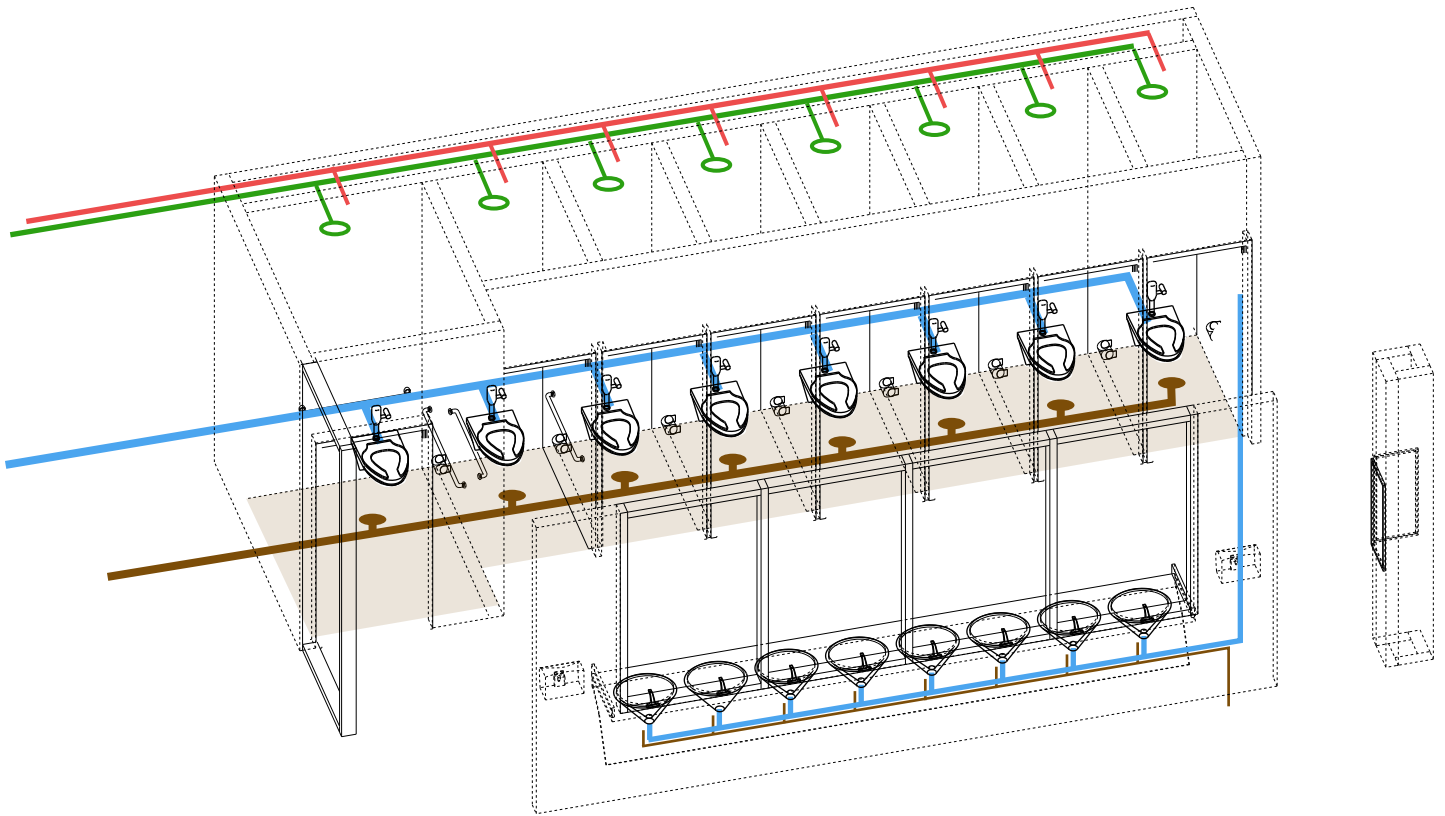


Figure 5: Axonometric Drawing of Inclusive Model. Inclusive restroom compartments should be designed with separate mechanical and electrical fixtures.

MECHANICAL / ELECTRICAL / PLUMBING

These key differences also include mechanical, electrical and plumbing differences. Because each compartment has full height walls, it should be designed with separate ventilation, lighting, and floor drain, respectively. Additionally, due to the visibility above the sinks in the hand-washing area, the path of plumbing lines needs to be highly coordinated with engineers and contractors. Since each of these compartments are technically rooms within themselves, they also require additional safety elements such as fire alarms and suppression systems (if applicable).

COST

Space and required number of fixtures notwithstanding (refer to part 2), inclusive models cost approximately \$12,500 more per compartment than typical restrooms. (Costs for this study are approximate and provided by Wenck Construction, Construction Manager for the construction of several inclusive restrooms for St. Paul Public Schools, in 2017 dollars.)

CODE IMPLICATIONS OF RESTROOMS IN K-12 FACILITIES: THE “E” OCCUPANCY

Since the enactment of the UBC (Uniform Building Code) in 1927 by the International Conference of Building Officials (now merged into the International Code Council, or ICC), architects have generally relied on state-adopted, regional or national model building codes to uphold the health, safety, and welfare of the public through a set of standardized requirements for safe construction. This includes requirements for the total number of bathroom fixtures based on the expected occupancy of a building, determined by the building's size and use. K-12 facilities typically fall under two separate occupancy classifications, the “A,” or assembly occupancy, and the “E,” or education occupancy. Each of the two classifications and their code ramifications will be explained separately, as the code implications under these two classifications differ for restroom facilities.

The following charts represent the total number of people per toilet fixture as required by the UBC/ICC from 1946 to the present for Type “E” (Education) occupancy, which customarily houses the learning functions of a school such as classrooms and laboratories.

UBC 1946-1991:



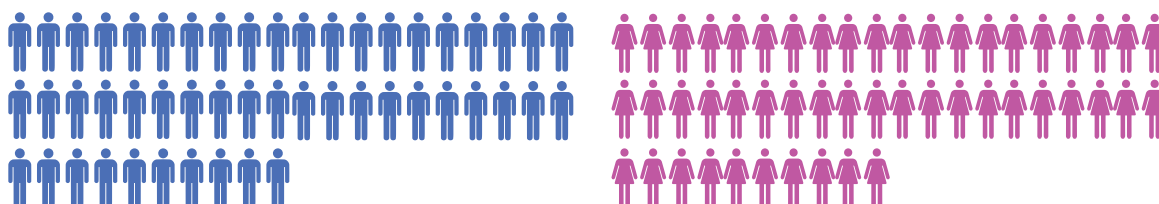
As shown, the UBC from 1946-1991 required 1 toilet fixture for every 100 males and 1 toilet fixture for every 35 females at the elementary school level. At the secondary school level, 1 toilet fixture was required for every 100 males, while 1 fixture was required for every 45 females (secondary shown shaded). Additionally, 1 urinal was required for every 30 males.

UBC 1994:



In 1994, the code was changed, drastically increasing the number of required fixtures for males and slightly increasing the number for females. One toilet fixture was required for every 30 males and 1 toilet fixture for every 25 females at the elementary school level. At the secondary school level, 1 toilet fixture was required for every 40 males, while 1 fixture was required for every 30 females (secondary shown shaded). Additionally, 1 urinal was required for every 30 males.

ICC 2000-Present:



In 2000, the code changed again, to require an equal number of fixtures per sex. One toilet fixture was required for every 50 males and females alike, although urinals could be substituted for up to 67% of the required toilets, and eliminated the distinction between grade levels.

CODE IMPLICATIONS OF RESTROOMS IN K-12 FACILITIES: THE “A” OCCUPANCY

The “A,” or Assembly occupancy, is traditionally the part of the building in which community facilities, such as pools, gymnasiums, cafeterias, as well as auditoriums are located. By allowing the separate treatment of differently used portions of the building in this manner, schools can save electricity and operational costs by shutting down more than half of their facility at night (the “E” portion), while opening up and operating the other portion for student and community events. In the A-3 occupancy sub-classification typically used in schools, there is a greater discrepancy in the amount of fixtures per sex than the E occupancy.

ICC 2000-Present:



The assembly, A-3, occupancy requires 1 toilet fixture for every 125 males and 1 toilet fixture for every 65 females. Urinals may be substituted for up to 67% of the required toilets in male restrooms.

While previously inclusive restrooms required building official approval as a satisfactory alternative design complying with the intent of the code (Miller 2016), the impending 2021 ICC will allow single-user restrooms to fulfill the required fixtures count for facilities, without the sex designation. (Fixsen 2016) (Collins 2016) (ICC 2015) This impending change, once adopted, will allow for the inclusive restroom model to be accepted without going through the alternative design approval process. This change in code will be international once adopted by all jurisdictions and have far reaching implications, and the draft reads as follows:

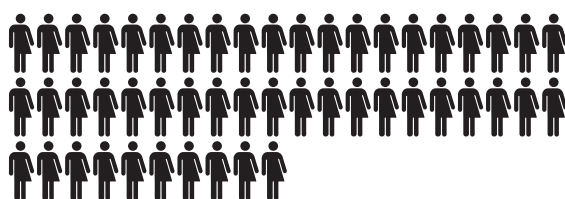
403.2 Separate facilities. Where plumbing fixtures are required, separate facilities shall be provided for each sex.

Exceptions:

1. Separate facilities shall not be required for dwelling units and sleeping units.
2. Separate facilities shall not be required in structures or tenant spaces with a total occupant load, including both employees and customers, of 15 or fewer.
3. Separate facilities shall not be required in mercantile occupancies in which the maximum occupant load is 100 or fewer.
4. Separate facilities shall not be required in business occupancies in which the maximum occupant load is 25 or fewer.
5. Separate facilities shall not be required to be designated by sex where single-user toilets rooms are provided in accordance with Section 403.1.2.
6. Separate facilities shall not be required where rooms having both water closets and lavatory fixtures are designed for use by both sexes and privacy for water closets are installed in accordance with Section 405.3.4. Urinals shall be located in an area visually separated from the remainder of the facility or each urinal that is provided shall be located in a stall.

<https://www.thebuildingcodeforum.com/forum/threads/gender-neutral-restrooms.25134/page-2>

IBC 2021 Anticipated:



With the pending 2021 code change, the number of fixtures required will be equal to the number of fixtures currently required to be provided for each sex, but will not need to be segregated. The differences between gender segregated facilities and inclusive will have an impact on space and building design for the better. Not only do inclusive restrooms save space by approximately 5 to 30 SF (see figure 8) per set of restrooms, but they also relieve the complications of a gendered space for those on the gender spectrum.

CODE IMPLICATIONS OF RESTROOMS IN K-12 FACILITIES (CONTINUED)

In addition, for those jurisdictions, like Minnesota, which require a unisex restroom to be located adjacent each set of gender segregated restrooms, additional space savings can be realized, as each restroom is considered to be unisex, so no additional restroom will be required.

A study comparing five remodeled or newly constructed schools by Cuningham Group Architecture from 2012-2017 was done to analyze several factors relating to restrooms. The schools are all high schools in Minnesota and range in square footage from 250,000 SF to 320,000 SF. Not all schools had inclusive restrooms.

The study comparing these six schools found that on average, each school had roughly 1.4 groups of bathrooms per 50,000 SF. A "group" as defined by this study is a set of facilities (gender-specific or not) within a common 50 foot radius. At a school with gender segregated facilities, this is an average of 4.0 fixtures for males and 5.7 fixtures for females per group, whereas at a school with inclusive facilities, the average is 6.5 fixtures. Schools with gender segregated restrooms invest in 10.5% more fixtures over all; however, if the same number of fixtures were inclusive, men would have access to 58% more restrooms, and women to 41% more. As schools shift from Education-type occupancy load to an Assembly-type load, inclusive schools provide men with access to 3 times as many fixtures and 1.5 times as many fixtures to women than the code required restroom counts provide at gender segregated schools.

In addition, when calculating the required number of fixtures to provide per code, architects traditionally divide the capacity in half, and then by the required number per code, to determine how many fixtures are required for each sex. Typically, this results in a non-round number of restrooms that are needed. Since it is impossible to build a fraction of a bathroom, architects have to round up for each sex. With the impending change in the code, the total capacity can be divided by the required number per code, which results in less bathrooms and more square footage for learning. (Figure 6)

Capacity*		E Occupancy				A Occupancy				Total Difference
		Gender Segregated		Inclusive	Difference	Gender Segregated		Inclusive	Difference	
		Male	Female			Male	Female			
Alexandria Area High School	1,550	16	16	31	-1	10	19	29	0	-1
Humboldt High School	1,350	14	14	27	-1	14	27	41	0	-1
Como High School	1,550	16	16	31	-1	18	34	52	0	-1
Sartell - St. Stephens High School	1,650	17	17	33	-1	15	28	43	0	-1
St. Cloud Technical High School	1,825	19	19	37	-1	15	28	43	0	-1

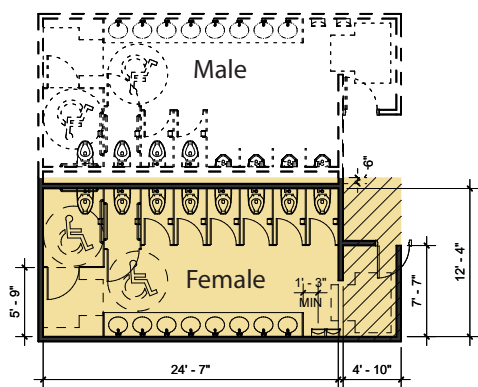
*Capacity includes students + staff.

Figure 6 Comparison of remodeled or newly constructed schools by Cuningham Group Architecture since from 2012-2017 and the code implications of inclusive and gender-segregated code required fixtures.

In addition to the space flexibility this code change provides, it also means greater equality for female students in terms of time. According to a study by Charles Gerba (Marsten 1999), females spend twice as much time in the bathroom as males. With average school passing times diminishing, this allows females to spend less time waiting, as theoretically, 50% more restrooms are available for use since facilities are shared. Beyond access for females, inclusive restrooms provide access to 50% more restrooms for **all students, using less area since** inclusive restroom models require less space (Figure 7).

CODE IMPLICATIONS OF RESTROOMS IN K-12 FACILITIES (CONTINUED)

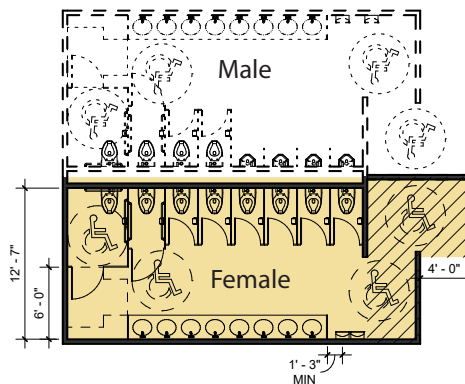
Because a key design component of this model involves full height walls, many people inquire how much more space this model requires over its gendered counterpart. Since inclusive restrooms are designed to be open to the hallway, they actually require less space over typical gendered restrooms. This is due to code requirements for maneuvering clearances at doors. Because gendered restrooms are typically designed with a door into the room for privacy, they require additional space for maneuvering than inclusive restrooms, which are open to the hall. Gendered restrooms that are designed to be open to the hall typically provide the same maneuvering clearances without a door to maintain viewing privacy from the hallway through the mirrors, which are typically above the hand-washing area. In inclusive restrooms, privacy is maintained at the compartment, eliminating this complex arrangement.



RESTROOM W/ SINGLE DOOR ENTRY

■ Total Area - 412.5 ft²

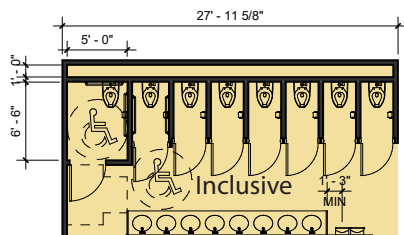
▨ Vestibule - 65.95 ft²



RESTROOM W/ OPEN VESTIBULE

■ Total Area - 443.45 ft²

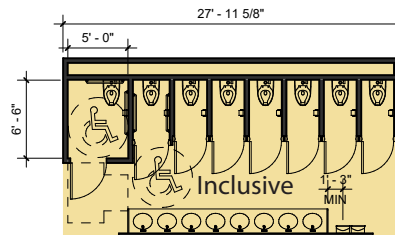
▨ Vestibule - 90.53 ft²



INCLUSIVE RESTROOM W/ OPEN ENTRY

■ Total Area - 407.29 ft²

▨ Vestibule - N/A



INCLUSIVE RESTROOM W/ OPEN ENTRY

■ Total Area - 407.29 ft²

▨ Vestibule - N/A

Figure 7: Gender segregated restroom layouts from Time-Saver Standards for Interior Design and Space Planning, second addition, updated and adjusted for current building code and Minnesota accessibility standards for educational facilities and Inclusive Model as designed for St. Paul Public Schools

ALTERNATIVE CODE COMPLIANCE: A CASE STUDY OF HUMBOLDT HIGH SCHOOL

(Note: the intent of the code compliance section of this research is to provide a case study, based on the 2015 Minnesota State Building Code, which incorporates the 2012 IBC and UPC. This research does not guarantee approval of the case study design by any particular building official.)

The code is anticipated to change in 2021 to allow inclusive restrooms, but for so many school districts who do not want to wait for their state to adopt the new code, this paper aims to be a guide. The next section enumerates ways in which the inclusive restroom model at Humboldt High School, as described in part 1, was approved as a code-compliant alternative design prior to Minnesota's adoption of this code change.

Specifically, there are four provisions which require alternative compliance as presented in the Humboldt High School case study which occur in the 2012 IBC and the ICC/ANSI A117.1-2009 Accessible and Usable Buildings and Facilities. (Note: some codes listed can be met by modifying the inclusive design to meet the code as it's written; however, this would require much more floor space and space is at a premium for most schools and building owners.)

Reaching Alternative Code Compliance at Humboldt High School: Approval of an alternative design is required for the following four provisions:

1. Chapter 11 - Accessibility, Section 1109.2 Exception 3: Other Features and Facilities, [2012 International Building Code](#)
2. Chapter 29 - Plumbing Fixtures, Section 2902.2: Separate Facilities, [2012 International Building Code](#)
3. Chapter 29 - Plumbing Fixtures, Section 2902.4 Signage, [2012 International Building Code](#)
4. Chapter 4 - Accessible routes, Section 404: Doors and Doorways, [ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities](#)

1. Chapter 11: Accessibility, Section 1109.2 Exception 3

The code reads, *"Where multiple single-user toilet rooms or bathing rooms are clustered at a single location, at least 50 percent but not less than one room for each use at each cluster shall be accessible."*

This means that half of the unisex compartments provided in a facility must be accessible, which require on average 50% more square footage per restroom, due to the accessibility code requirements for these rooms. This would create a burden on building owners in terms of space as this requirement does not apply to gendered restrooms as they are not considered single-user toilet rooms. Since this is not a requirement for gender segregated restrooms, it can be argued that a reasonable number of accessible toilet rooms should be provided, since this is the intent of the code. At Humboldt High School, a reasonable number was determined and approved by the building official for both E and A occupancies, respectively.

For the E, or Educational occupancy, each "bank" of single user toilet rooms, two accessible and one ambulatory compartment was provided. This was considered reasonable, as this would be the same or similar number of accessible stalls provided in its gendered counterpart.

For the A, or Assembly occupancy, determining a reasonable number was more difficult. In calculating the number of required plumbing fixtures in the A occupancy at Humboldt, a scenario in which three major events could occur simultaneously in the building was presented. These three events included using all three of their major assembly spaces at once: a sporting event in the spectator gym and pool, respectively, as well as a theatrical production in the auditorium. Using the accessibility code for the number of accessible seats that are required for those three events, it was determined to be reasonable to offer the same number of accessible fixtures available to students, staff, and spectators alike. Additionally, it was acknowledged that the number of accessible fixtures was tripled with this remodeling over what is available prior to the remodeling.

2. Chapter 29: Plumbing Fixtures, Section 2902.2: Separate Facilities

The code reads, *"Where plumbing fixtures are required, separate facilities shall be provided for each sex."*

Many of the key design components described in this paper directly relate to this code requirement, as the intent of the code for providing separate facilities for each sex is written in the code commentary, "The separate facilities requirement for males and females addresses two main concerns: privacy and safety." (2012 IBC Code Commentary, 29-13)

In Saint Paul, the building officials acknowledged that the water closet compartments designed to separate each compartment, which are full height, acoustical walls, satisfy the intent of the code for privacy.

Additionally, the door hardware is special and contributes to the privacy of the design for two reasons:

- locks have occupancy indicators on both sides of the door, ensuring to users on both sides whether the door is secure or not.
- closers are programmed to leave doors slightly open when not in use as a safety precaution to know when rooms are occupied or not to passersby.

ALTERNATIVE CODE COMPLIANCE: A CASE STUDY OF HUMBOLDT HIGH SCHOOL

(Note: the intent of the code compliance section of this research is to provide a case study, based on the 2015 Minnesota State Building Code, which incorporates the 2012 IBC and UPC. This research does not guarantee approval of the case study design by any particular building official.)



Figure 8: Rendering of Inclusive Restroom Design at SPPS Humboldt High School, common handwashing area.

Another key design component to inclusive restrooms addresses the second intent of the code requirement for separate facilities: safety. Inclusive restrooms are designed to be highly visible, with glass and openings surrounding the restrooms. In addition, to increase visibility of these restrooms, the building officials in Saint Paul mandated that each bank of restrooms be located at the intersection of two hallways. An additional benefit of the openness of inclusive restrooms is that security cameras can be located in the adjacent hallways for additional monitoring without reducing privacy in the toilet compartments.

3. Section 2902.4 Signage

The code reads, *“Required public facilities shall be designated by a legible sign for each sex. Signs shall be readily visible and located near the entrance to each toilet facility...”*

Inclusive restroom signage could easily be a separate research paper in and of itself. That said, since inclusive restrooms are designed to be used by everyone, signage designating an individual sex would not be appropriate. For Humboldt High School, it was acceptable to locate a sign to designate the space for both sexes with a corresponding pictogram near the entrance of each toilet cluster.

4. Chapter 4: Accessible routes

The code reads, *“Swinging Doors shall have maneuvering clearances complying with Table 404.2.3.2”*

Since this would require a large amount of floor space, this becomes an unreasonable burden to building owners, especially considering that this is not a requirement in gender segregated facilities, since toilet partitions do not have the same requirement as doors for clearances. As such, it is reasonable to propose that the individual toilet rooms be treated similarly to traditional partition-style compartments and that the non-wheelchair accessible rooms not be required to provide the door clearances as required in table 404.2.3.2.

TABLE 404.2.3.3--MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS

TYPE OF USE		MANEUVERING CLEARANCES AT MANUAL SWINGING DOORS	
Approach Direction	Door Side	Perpendicular to Doorway	Parallel to Doorway (beyond latch unless noted)
From front	Pull	60 inches	18 inches
From front	Push	48 inches	0 inches
From hinge side	Pull	60 inches	36 inches
From hinge side	Push	54 inches	42 inches
From hinge side	Push	42 inches	22 inches
From latch side	Pull	38 inches	24 inches
From latch side	Push	42 inches	24 inches

Clearly, having an open dialogue throughout the design of the restrooms with a local building official is greatly beneficial to both designers, owners, and officials alike. Touring local examples of inclusive designs is also valuable in understanding the complexity of this new model.

The inclusive restroom model described in part 1 at Humboldt High School were based on a previous inclusive restroom prototype at Johnson High School, which is an Aerospace and Engineering Magnet school within the St. Paul Public School District. Since the restrooms at Humboldt High School are expected to be complete in the Fall of 2020, this post-occupancy survey was conducted at Johnson High School, designed by TKDA Architects and completed in 2016. The survey was conducted in December 2018 and 794 students participated. The limitations of the research should be acknowledged: this survey data represents one school and age group; further research should be conducted at both elementary and middle schools to understand if the results vary by age of student.

Johnson High School At a Glance*:

Grades: 9-12

Enrollment: 1,340

Demographics:

Asian: 54%

Black: 24%

Hispanic: 10%

White: 10%

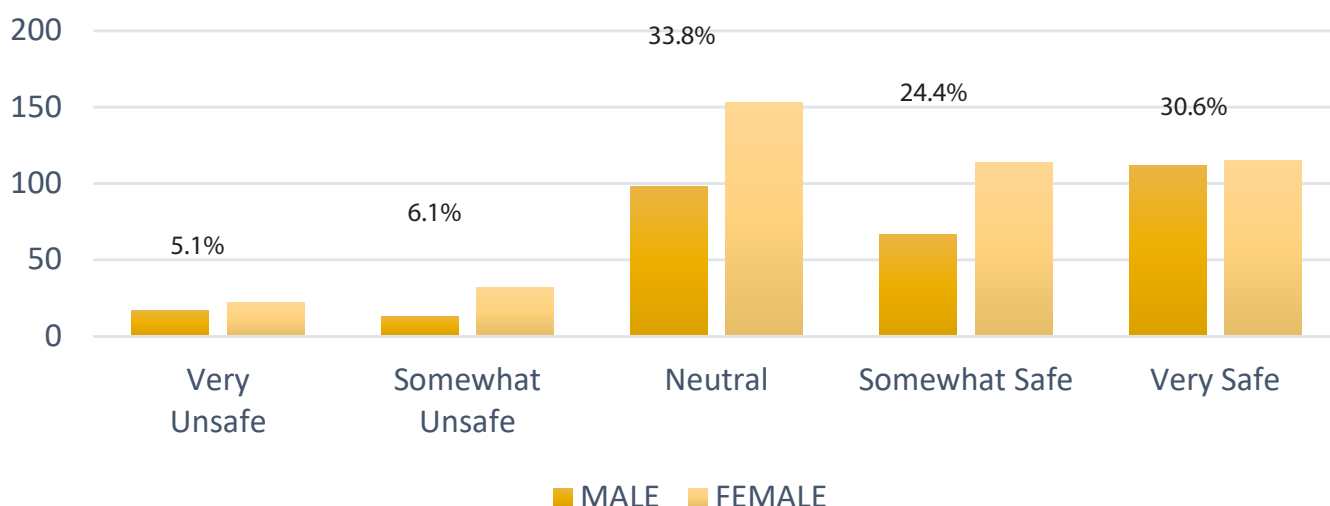
% Free and Reduced Lunch: 82%

*Based on October 3, 2016 Data as posted by St. Paul Public Schools Data Center.

Of the nearly 800 survey responses received, 52 % of respondents were female while 39% were male; the remaining respondents either preferred not to state their gender, while 1% identified as transgender, non-binary, or fluid. The survey was written to understand which key design components enumerated in part III of this paper impact their feelings of safety and security. Additionally, since the inclusive restroom model has been in place for two years, the research aims to understand if those students who experienced both the gender segregated and inclusive model at Johnson High School feel safer in the gender segregated or inclusive restrooms; 39% of respondents fall into this category of experiencing both models. Lastly, students were asked to comment on the top three key design components that contributed most to their feelings of safety and security.

Furthermore, the survey data is separated by gender to understand if the inclusive model impacts the genders differently. When asked how safe the students feel using the current, inclusive restrooms, an overwhelming 89% of respondents felt either neutral, somewhat safe or very safe, while 30.6% felt very safe.

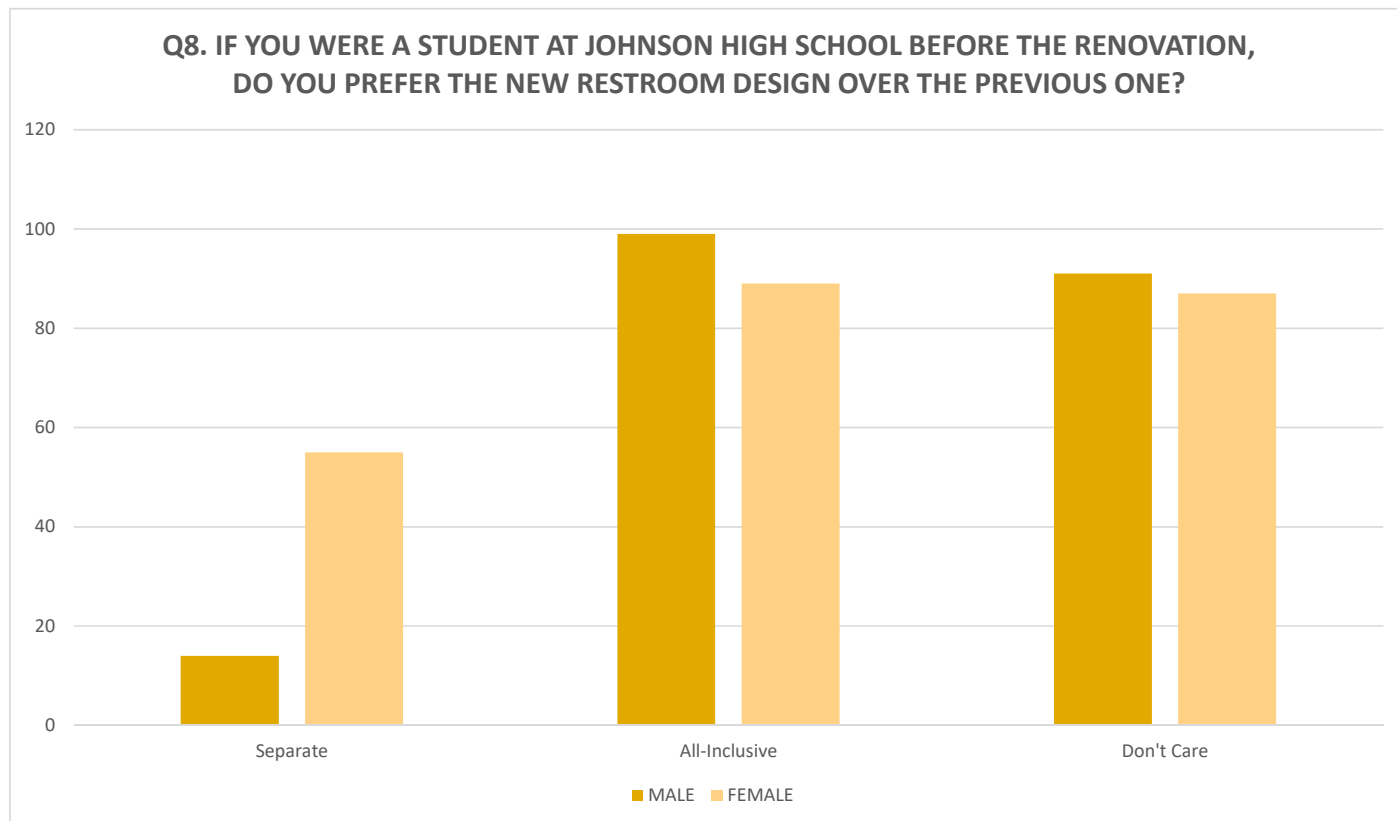
Q4: PERSONAL SAFETY: HOW SAFE DO YOU FEEL USING THE CURRENT, ALL-INCLUSIVE RESTROOMS?



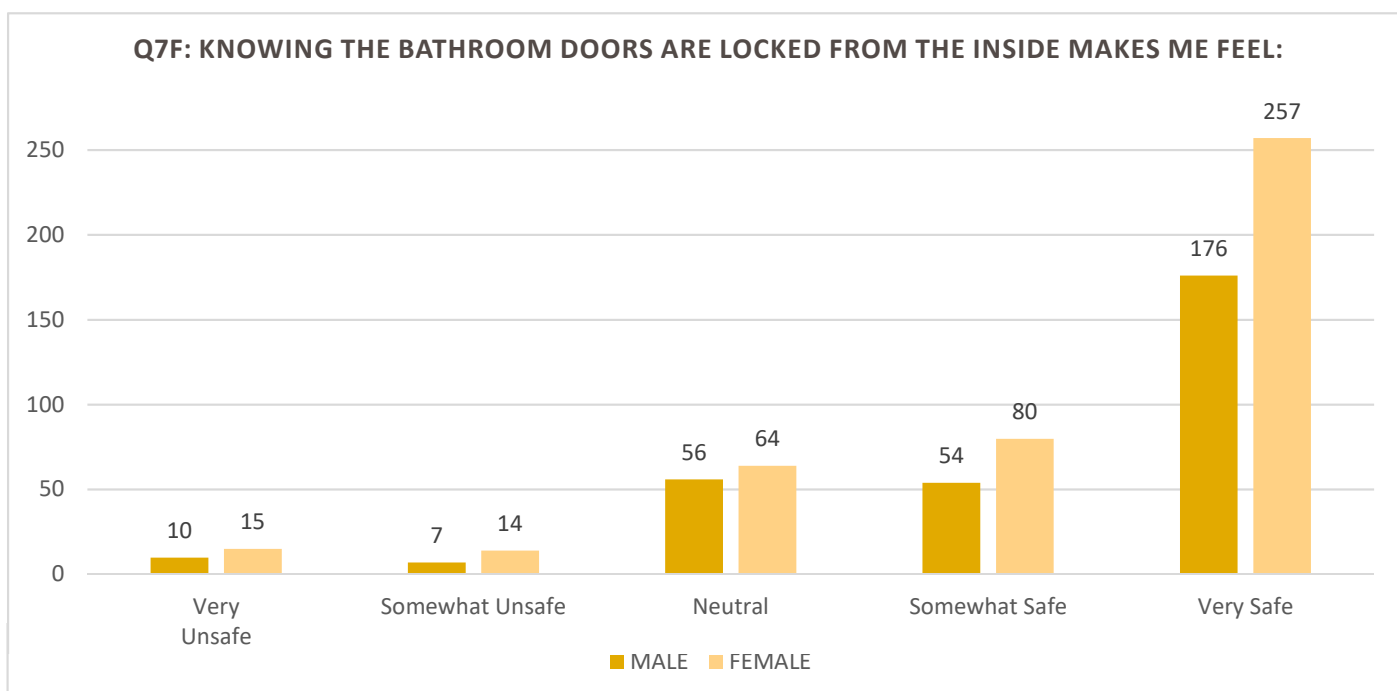
Students were given the chance to write in additional comments. While it may be anecdotal, surveys which resulted in the very unsafe and somewhat unsafe responses to this question were further studied for additional comments. Several of those respondents noted the response was due to the uncleanliness of the restrooms as contributing their very or somewhat unsafe feelings.

Additional comments for the somewhat and very safe responses largely contributed their response to the sense of personal space and privacy that the inclusive model afforded them.

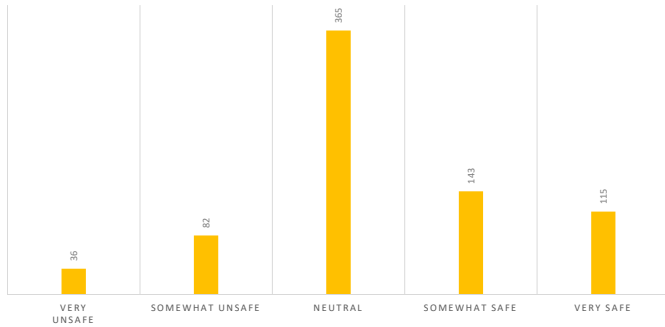
Furthermore, the juniors and seniors, who experienced both the gender segregated and inclusive model, were asked which they preferred; 43% were in favor of the inclusive model, while an additional 40% didn't mind either way.



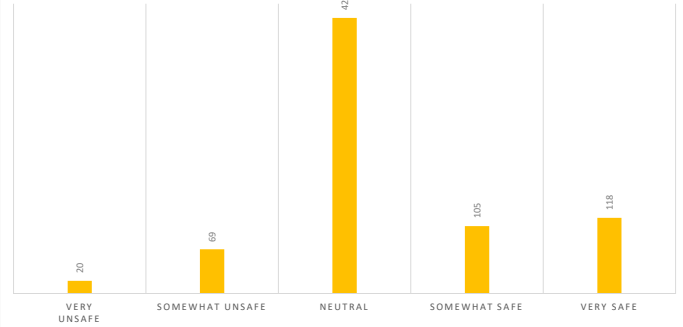
Perhaps the most important result of this research is to understand which of the key design components contribute most to the students' feelings of safety and security. Interestingly, all but one of the key design components received mostly "neutral" comments as to whether they contributed to students' feelings of safety and security (refer to results, next page). The one clear design component that contributed to students' feelings of safety and security is knowing the doors are locked from the inside of the stall; 59% of both males and females felt that this component was most critical to their feelings of safety and security.



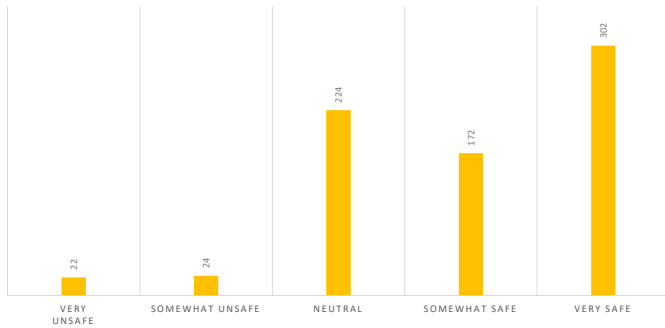
Q7A: HAVING BATHROOM STALL DOORS THAT CAN BE SEEN FROM THE HALL MAKES ME FEEL:



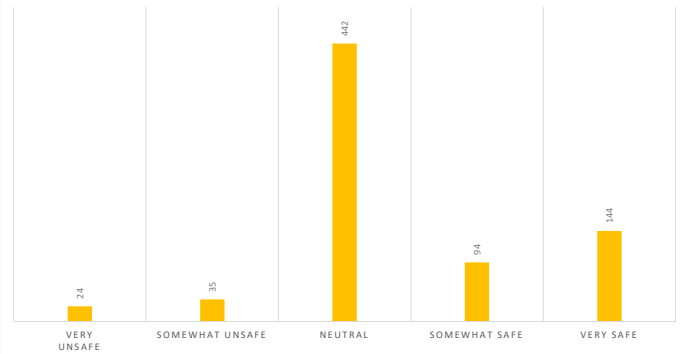
Q7B: HAVING A WINDOW ABOVE SINK AREA MAKES ME FEEL:



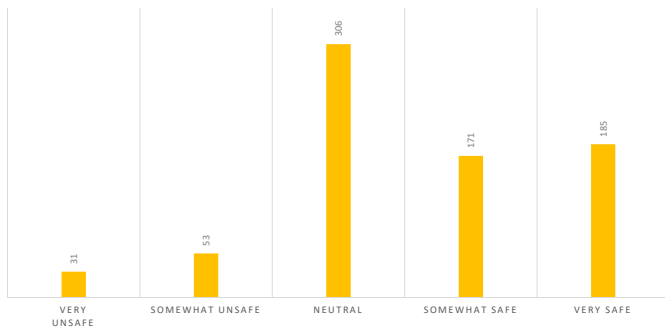
Q7C: HAVING ACCESS TO INDIVIDUAL BATHROOMS MAKES ME FEEL:



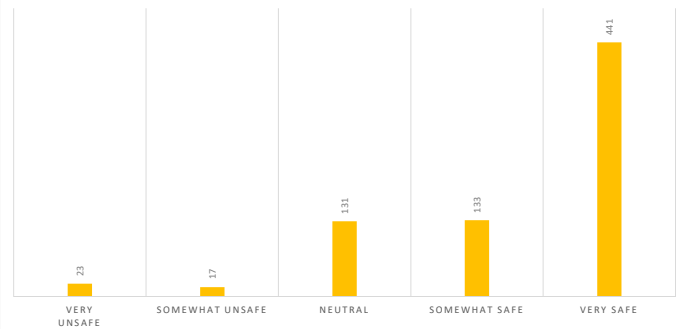
Q7D: HAVING MIRRORS ON COLUMNS MAKES ME FEEL:



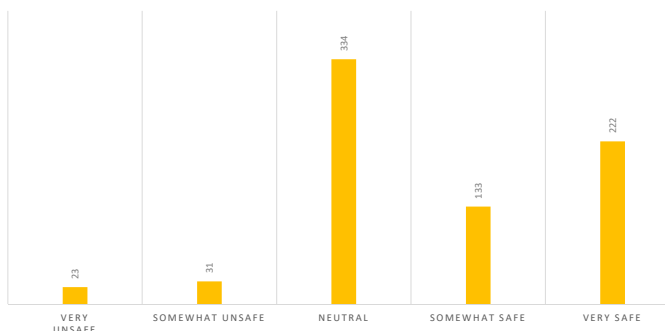
Q7E: SECURITY CAMERAS IN THE HALLWAYS MAKES ME FEEL:

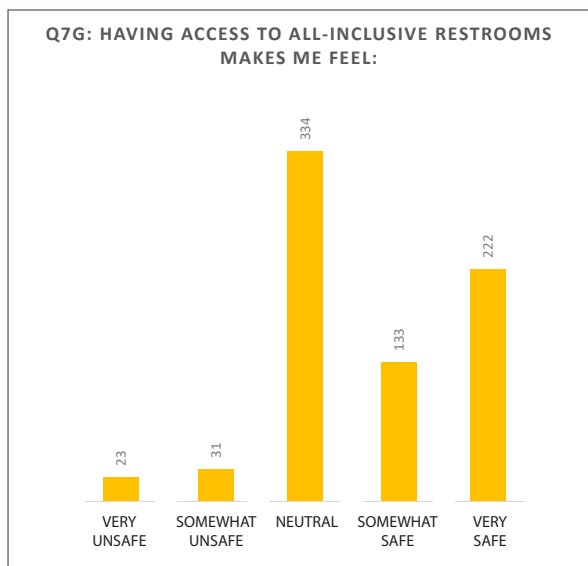
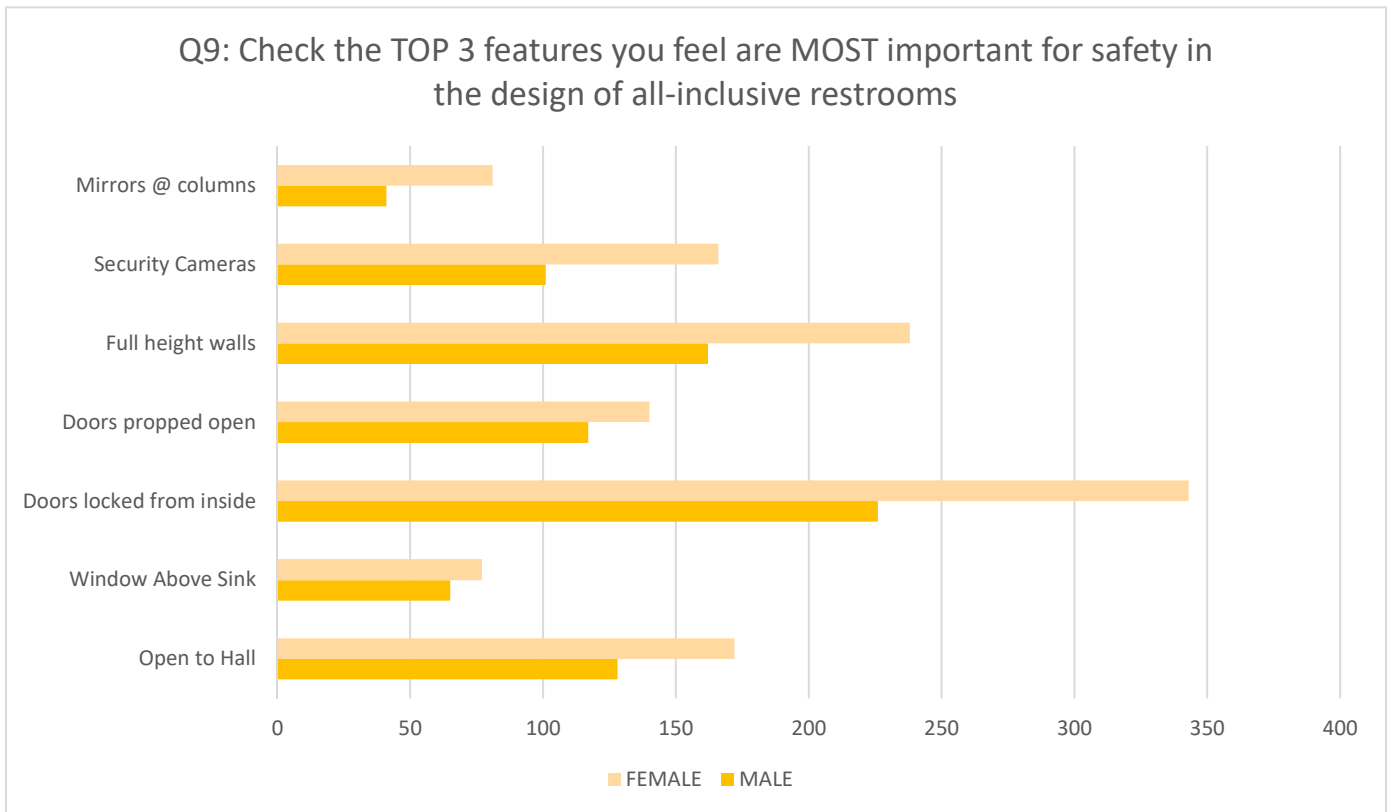


Q7F: KNOWING THE BATHROOM DOORS ARE LOCKED FROM THE INSIDE MAKES ME FEEL:



Q7G: HAVING ACCESS TO ALL-INCLUSIVE RESTROOMS MAKES ME FEEL:





In addition to the ability to see that the doors are locked from the inside of the stall, the top three design components that should be considered in the design of inclusive restrooms, as validated by these survey results are :

1. Being able to see if the doors are locked from the inside
2. Full height walls
3. Openness to the hallway

When taken into account, the additional comments students of both genders expressed their need for privacy during the day, and the design of these restrooms fulfills that need.

Students also mentioned that this restroom model alleviated previous behavior such as fighting, or fear of photos taken of them under the open stalls of the gender segregated restrooms.

Admittedly, not every district is ready or has the resources to provide inclusive restrooms throughout their school district. The simple act of providing students access to inclusive restrooms, according to the results of this research, is positive, with 48.6% of respondents noting that it contributes to their feelings of safety and security.

Introduction:

We are doing an evaluation of the restrooms in your school to understand how your new all-inclusive restrooms compare to the separate boys' and girls' restrooms that were here before. Your feedback is **extremely valuable** as it **will inform future school designs**. The components of each restroom in Figure 1 are labeled to reflect the terms used by this survey.

Your responses to this survey are completely anonymous. Please answer all relevant questions to the best of your ability.

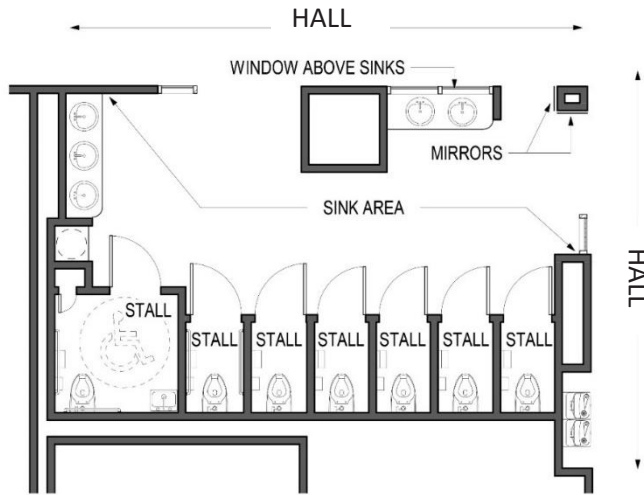


Figure 1. Johnson High School All Inclusive Restroom Plan



Figure 2. Johnson HS All Inclusive Restroom Photo

1. To which gender do you most identify?

☐ Male ☐ Female ☐ Other: _____

2. Do you identify as transgender, non-binary or gender-fluid?

☐ Yes ☐ No ☐ Prefer not to say

3. Grade:

☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior

4. Personal Safety: How safe do you feel using the current, all-inclusive restrooms?

(Check the box that best applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

5. If you were a student at Johnson High School before the renovation, do you feel that the new restrooms are more or less safe than the previous restrooms? (Check the box that best applies, if applicable)

- ☐ New restrooms are more safe than before
☐ New Restrooms are less safe than before
☐ I don't notice a difference

6. Please describe briefly why you feel the new restrooms are more or less safe than the previous restrooms (if applicable). (Please write comments in space below)

7. How do the following aspects of the restroom design affect your feeling of safety?

A: Having bathroom stall doors that can be seen from the hall makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

B: Having a window above sink area makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

C: Having access to individual bathrooms makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

D: Having mirrors on columns makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

E: Security cameras in the hallways makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

F: Knowing the bathroom doors are locked from the inside makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

G: Having access to all-inclusive restrooms makes me feel: (Check the box that applies)

☐ Very Unsafe ☐ Somewhat Unsafe ☐ Neutral ☐ Somewhat Safe ☐ Very Safe

8. If you were a student at Johnson High School before the renovation, do you prefer the new restroom design over the previous one? (Check the box that applies)

- ☐ I prefer separate boy's or girl's room (previous bathrooms)
- ☐ I prefer all-inclusive design (current bathrooms)
- ☐ Don't care either way
- ☐ I wasn't here before the restrooms were changed

9. Check the TOP 3 features you feel are MOST important for safety in the design of all-inclusive restrooms.

- | | |
|---|---|
| <input type="checkbox"/> Open to the Hallway | <input type="checkbox"/> Full Height Walls |
| <input type="checkbox"/> Window above Sink | <input type="checkbox"/> Security Cameras |
| <input type="checkbox"/> Being able to see if doors are locked from the inside of the stall | <input type="checkbox"/> Mirrors at Columns |
| <input type="checkbox"/> Doors Propped Open when not in use | <input type="checkbox"/> Other: _____ |

10. Additional Comments: (optional): (Please write comments in space below)

S U M M A R Y

There are several key design components that separate inclusive restrooms from gender segregated restrooms including their location within school facilities, visibility and openness to the hallway, full height walls and doors, as well as mechanical, electrical, and plumbing differences. All of which translate into a cost premium for this model.

However, I would argue that the flexibility that this model affords in terms of location and square footage savings, not to mention the reduced stress afforded by individuals on the gender spectrum, more than make up for the increased cost.

With the impending change of the building code to allow single user restrooms to be counted towards the minimum number of code required fixtures, and not be signed as either gender, I believe that inclusive restrooms are the wave of the future.

It's time to rethink restrooms for all people.



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BIBLIOGRAPHY

- AIA: Office of General Counsel. 2017. 2017 Code of Ethics and Professional Conduct. Code of Conduct, American Institute of Architects.
- Ball, Aimee Lee. 2015. "In All-Gender Restrooms, the Signs Reflect the Times." *The New York Times*. November 5. <https://nyti.ms/1RxHpEM>.
- Blyth, Alastair, Anthony Gilby, and Mel Barlex. 2006. Guide to Post Occupancy Evaluation. Guide, Higher Education Funding Council for England.
- Collins, David S. 2016. "New Code Provision for Gender-Neutral Restrooms." AIA KnowledgeNet. June 29. <https://network.aia.org/blogs/cindy-schwartz/2016/06/28/architects-propose-design-solutions-for-equitable-restrooms>.
- Cordell, David. 2016. "Free From Fear: Gender-Neutral Restrooms and Inclusivity in Design." *ideas + buildings | People and Perspectives at Perkins + Will*. February 02. <http://blog.perkinswill.com/free-from-fear-gender-neutral-restrooms-and-inclusivity-in-design/>.
- Fixsen, Anna. 2016. "Architects Propose Design Solutions for Equitable Restrooms." *Architectural Record*. June 20. <http://www.architecturalrecord.com/articles/11749-architects-propose-design-solutions-for-equitable-restrooms>.
- Gates, Gary J. 2011. How Many People Are Lesbian, Gay, Bisexual, and Transgender? Summary of Findings, Los Angeles: The Williams Institute, UCLA School of Law.
- Grant, Jaime M, Lisa A Mottet, Justin Tanis, Jack Harrison, Jody L Herman, and Mara Keisling. 2011. Injustice at Every Turn: A Report of the National Transgender Discrimination Survey. Survey Findings, Washington: The National Gay and Lesbian Task Force and the National Center for Transgender Equality.
- Hay, Rowena, Simon Bradbury, Dylan Dixon, Kat Martindale, Flora Samuel, and Alex Tait. 2016. Building Knowledge: Pathways to Post Occupancy Evaluation. Reading: Value of Architects, University of Reading, RIBA.
- Herman, Jody L. 2013. "Gendered Restrooms and Minority Stress: The Public Regulation of Gender and its Impact on Transgender People's Lives." *Journal of Public Management & Social Policy*, 65-80.
- IBC Code and Commentary Volume 2. 2012. ICC. September 2011. 29-13
- ICC. 2015. 2015 Group A Public Comment Agenda. Building Code Revisions and Public Comment, Country Club Hills, IL: International Code Council, Inc.
- Marsten, Wendy. "SCIENTIST AT WORK: CHARLES GERBA; On Germ Patrol, at the Kitchen Sink." FEB. 23, 1999. *NY Times*
- Miller, Meg. 2016. "How Architects Are Fighting For Gender-Neutral Bathrooms." *Co.Design*. September 6. <https://www.fastcodesign.com/3063394/how-architects-are-fighting-for-gender-neutral-bathrooms>.
- Nardella, Matt. 2015. "Smart Architecture Solves the Political Problem of Gender Neutral Restrooms." *moss::: Ecological, Green, Holistic, Sustainable Architecture and Design*. November 2. <http://moss-design.com/gender-neutral-bathrooms/>.
- . 2015. "The Space Between Gender Neutral and Accessible Restrooms." *moss::: Ecological, Green, Holistic, Sustainable Architecture and Design*. January 20. <http://moss-design.com/gender-neutral-restrooms/>.
- OSHA. 2015. "A Guide to Restroom Access for Transgender Workers." Recommendations.
- Refuge Restrooms. 2017. <http://www.refugerestrooms.org/>.
- Sanders, Joel, and Susan Stryker. 2016. "Stalled: Gender-Neutral Public Bathrooms." *South Atlantic Quarterly* 115 (4): 779-788.
- Stringer, JAC. 2009. "Gender Neutral Bathrooms." *Transwellness.org*. <http://transwellness.org/resources/educational-materials/gender-neutral-bathrooms/>.
- n.d. "The Case Against Fully Shifting to Gender Neutral Bathrooms." *SoCawlege*. <http://socawlege.com/the-case-against-fully-shifting-to-gender-neutral-bathrooms/>.
- Tobia, Jacob. 2017. "Why All Bathrooms Should Be Gender-Neutral." *TIME*. March 23. <http://time.com/4702962/gender-neutral-bathrooms/>.
- Uniform Building Code, several versions 1946-1994, Section 805, Chapter 8--Requirements for Group C Occupancies (Classroom)
- Transgender Law Center. 2005. Peeing In Peace. San Francisco, CA. <http://translaw.wpengine.com/wp-content/uploads/2012/05/94930982-PIP-Resource-Guide.pdf>.
- Verges, Josh. 2016. "St. Paul's Johnson High Eliminating Gender-Specific Restrooms." *Twin Cities Pioneer Press*. May 3. Accessed August 15, 2017. <http://www.twincities.com/2016/05/03/st-pauls-johnson-high-converting-all-restrooms-to-single-occupancy/>.
- Wilcox, JoAnn Hindmarsh, and Kurt Haapala. 2016. "How to Design School Restrooms for Increased Comfort, Safety and Gender-Inclusivity." *Arch Daily*. November 15. <http://www.archdaily.com/799401/how-to-design-school-restrooms-for-increased-comfort-safety-and-gender-inclusivity>.
- Williams, Joe Jack, Ben Humphries, and Alex Tait. 2016. Post Occupancy Evaluation and Building Performance Evaluation Primer. Primer, Royal Institute of British Architects.
- Worldometers. 2017. U.S. Population (2017) - Worldometers. <http://www.worldometers.info/world-population/us-population/>.