

Public Restroom Design through Role-playing and Problem Finding

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Category CR: Codes and Regulations
GHD: Global Perspectives and Human-Centered Design

Type Class Assignment

Level Undergraduate: second-fourth year; Graduate

Duration One week

Abstract Public restroom planning, despite the creative and technical skills and multiple stringent codes used to create them, is still one area exuding with unmet user needs. A focus on compliance with ADA code and an assumption that planning for disabilities serves all could be the cause. Because of this, sensitivity to the physical and behavioral needs of the populous at large has not been addressed. Those who are shorter or taller, younger and older, larger, navigating with bags or children, and transgender individuals find public restrooms to be physically hindering and emotionally challenging.

The restroom experience could be improved for all by employing an inclusive design approach through the application of empathic design, human behavior, universal design, anthropometrics, and ADA. Through problem finding exercises and role-play, this project offers the opportunity to design public restrooms that better provide by reducing stressors and increasing safety for all users

Learning Objectives

1. To understand the value of incorporating guidelines other than ADA code such as empathic design, human behavior, universal design, and anthropometrics into public restroom design in order to provide for a wider population.
2. Using problem finding through role play as a means to create better designed restrooms for a wider range of individuals.
3. Thinking critically about social issues, the built environment, and behavioral issues in restroom design.

4. Developing an awareness of the definition and language of disability defined by the Americans with Disabilities Act and developing empathy for the topic.
5. Participation in a team assignment and documentation of the process through various media.

CIDA Performance Standards

Standard 2 Global Perspective for Design (d)

Standard 3 Human Behavior (a, b, c, & d)

Standard 4 Design Process (a, b, c, d, e, f, g, & h)

Standard 5 Collaboration (c)

Standard 6 Communication (a, b, c, g)

Standard 11 Furniture, Fixtures, Equipment, and Finish Materials (a, c)

Standard 14 Regulations (i)¹

Criteria Humans are emotional beings. Our interactions with everyone and everything around us elicits a constant and varying level of emotional dialog. Empathic design is an observational research methodology that taps into the emotions consumers experience while interacting with products and processes to improve their design(Battarbee, Suri, & Howard, 2014).

Interior designers can also use empathic design to improve the environments they create. When it comes to public spaces, restrooms are one area that exude with unmet user needs. Public restroom design has been governed by the Americans with Disabilities Act (ADA) since 1994. Most designers primarily depend on it assuming compliance with mounting dimensions and wheelchair clearances ensures all user needs have been met. Yet there are multiple repeated problems within restrooms such as narrow regular stalls, cracks in partitions, products that don't fit the intended purpose, smells, pooled water on sinks, unresponsive automatic sensors, dirty grout, and more that is not addressed within ADA. These problems are magnified when navigation is hindered by physical disability or caregiving.

The intention of this assignment is to equip students in empathic design as a research tool to inclusively design public restrooms. Students will have the opportunity to hone their critical listening skills and the chance to improve upon their design during programming versus learning from their or other's mistakes during the contract document or post-occupancy phases.

Women's restrooms are selected as the unit of observation specifically over unisex or men's restrooms because they require more equipment, activities, and generally a greater quantity of people occupying a single stall at once. Therefore, women's toilets are an example of planning for the most extreme scenario in restroom design.

¹ Council for Interior Design Accreditation. (2014). Professional standards [PDF file]. Retrieved at <http://accredit-id.org/professional-standards/>

Entry skills. This exercise requires students to have acquired the following skills: hand drafting, including the knowledge of scale, dimensioning, line weights and line types; graphic symbology of basic plumbing fixtures, restroom fixtures and equipment; creating plans, elevations, and details appropriate to a project; surveying; sketching; and an awareness of anthropometry, universal design, and empathic design.

Students must also be able to integrate oral, written, and visual materials to present ideas clearly. The assignment requires students to know how to use the following software: word processing, saving internet images, scanning images, digital photo editing, and copying images from Adobe Reader. Instructors may require students to obtain video editing knowledge in order to embellish and publish to the Internet.

Subordinate skills. This exercise allows the concurrent development of the following skills: knowledge of commercial restroom fixtures, finishes, equipment and ADA code.

Prior knowledge of topic area. Since all have entered public restrooms at one point in their lives, most have pre-established empathic knowledge on how bathrooms are planned and the constraints of regular toilets. Most also might admit to having a preference for the ADA stall. What students may not possess, however, is knowledge to design for life scenarios they have yet to encounter such as caregiving for small children, traveling with luggage, or a physical disability.

Required tools

General supplies:

- Digital camera with picture and video recording capability
- Step stool.
- Video sharing website account
- Clipboard, sketch pad, pencil, and an imperial tape measure (25 ft min).
- Sanitizing wipes or rubber gloves.

Scenario specific navigational hindrance tools:

- Standard non-motorized wheelchair
- Standard carry on suitcase approximately 22 x 18 x 10 inches (varies per airline).
- Infant or toddler simulators. An infant simulator is a doll programmed to not stop crying and requires regular intervals of care. The ideal toddler doll would have bendable joints and the ability to stand and sit unassisted. Either simulator provides the experience of a parent having to carry a diaper bag and utilize a stroller or car seat within the restroom environment. Colleges may have simulators in programs such as human development, education, or medicine.

- Stroller or infant car seat based on available simulator. The stroller can be a smaller scale version with a scissor-fold design. The car seat must be the carry type with a handle.
- Diaper bag stocked with diapers, bibs, wipes, lotions, ointments, toys ect.
- Taped hand. Tape the four fingers of both hands to mimic hands with restricted use.

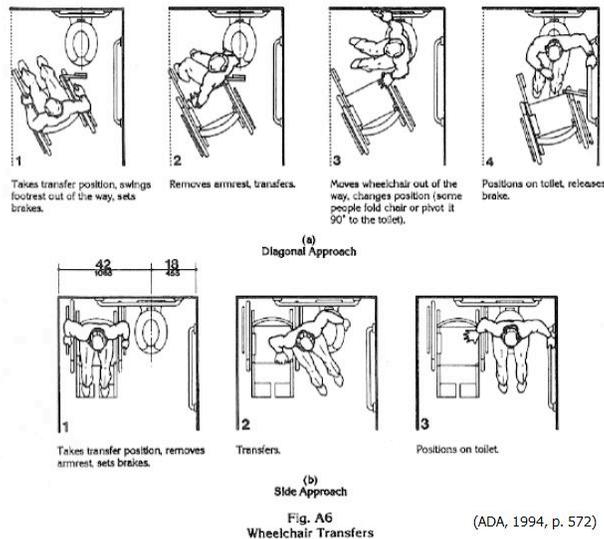
Process **General Information**

Divide the students 2 to 3 persons per group to complete this exercise. All scenarios must be conducted by navigating the restroom from the exterior of the entry, into a regular or ADA stall (as specified), the wash area and the exit. Regular interaction is required with the specified restroom fixtures and equipment defined in the navigational work sheet. The study will need to be conducted in a building with lower traffic and during a timeframe with less people such as on nights or weekends so as not to disrupt and concern restroom patrons.

This assignment could be expanded to other scenarios such as caregivers with multiple children, those with an inability to reach above shoulder height, and walker users. Additionally, a scenario on gender neutral bathrooms could be explored. Resources on gender neutral restrooms are provided in the reference section.

Role Play Scenario Types:

Wheelchair Bound. Complete the general scenario by navigating the ADA stall. In the ADA stall, complete a wheelchair to toilet transfer. Use wipes and rubber gloves if needed to clean the toilet area.



The Traveler. Complete the general scenario by navigating the regular stall. In this

scenario, the suitcase must be brought into the stall.

Child Caregiver. Complete the general scenario by navigating the regular stall and the ADA stall. In this scenario, the toddler doll in the stroller or infant in the car seat must be brought into the stall. Role play assisting the doll with going to the bathroom by positioning it on the toilet. Remain in the stall for a minimum of seven minutes.

Restricted Use Hands: Complete the general scenario by navigating the regular stall. This scenario is intended to provide the experience of navigation without fully functional hands, reducing the ability to grasp.

1.1 –1.6 Navigational work sheet Instructional Goal & Directions

1.1 Navigate a regular and ADA restroom environment with navigational hindrance tools (wheelchair, toddler scaled poseable doll in a stroller, suitcase).

In the navigational work sheet provided, record the scenario type, restroom area type, and hindrance tool type. Copy and paste or reproduce the chart for the additional scenarios.

1.2 Identify Restroom items: fixtures & equipment.

A list of restroom fixtures and equipment is provided in the navigational work sheet. Identification of the item is assumed with completed work.

1.3 Identify navigational constraints.

Begin your documentation at this point with video and pictures.

1.3.1 Record empathic user comments on constraint (from Guest speaker, additional resources, and group scenario experience) in relation to the navigational hindrance tool.

Record any empathic user comments made from special guest presenters and from the provided resources. While filming the student scenario, talk aloud about the experience expressing any constraints and emotions you feel.

Filming procedure for regular stall. If at all possible, the participant should film from their perspective, but if that is not possible, have a partner record the participant entering and closing the stall door. To get a better camera angle, open the door and film the scenario by pretending the stall door is closed. If the stall door impedes use of the equipment, then have the videographer stand over the stall partition on a stepladder. Group members are to prompt the active participant to talk aloud as they interact with the equipment, to express their emotions, and the reason why an interaction is not working as it should.

Succinctly summarize and transcribe the emotions and comments in the blank

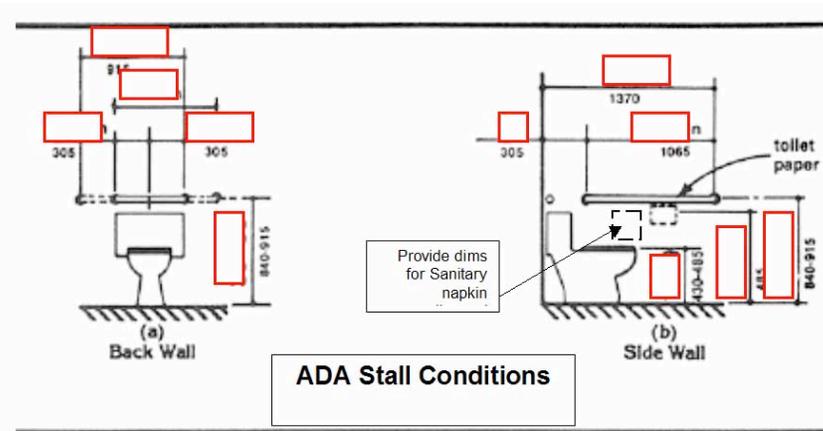
provided (except for navigation constraint - 1.4 provides a blank to record the cause of the navigational constraint). When complete, load your video to your video sharing website. Provide a link to the video in the blank provided. Instructors may require additional video editing prior to submittal to refine the presentation.

1.3.2 Provide the ADA image or code section number and paragraph that complies with the restroom item.

Search the ADA guide and provide the applicable code for the item. Provide either an image or the code number and passage. If none exists, note as such.

1.3.3 Measure and record existing conditions with an Imperial unit tape measure
For the ADA stall, sink area, and entry, provide existing measurements for mounting heights and operable parts to the extent found in ADA code. For example: existing grab bar centerline, heights to the operable part, etc. If dimensions are provided in a sketch, refer to the drawing in the blank and submit the sketches along with the assignment sheets. For example: refer to drawing A. Ensure integration of materials is clear.

Examples of required ADA measurements. (ADA, 2010)



1.4 In a general statement, identify the cause of the navigational constraint. In the blank provided, identify the cause of navigational constraint. What is it about the fixtures and equipment or navigational hindrance that is causing a constraint? Provide a general description of the problem found and include recorded dimensions if they are a contributor. Indicate if no constraint is present, but provide an example where the user has experienced a constraint in the past.

1.5 Keeping the scenario consumer in mind, propose a written solution for the problem.

In the blank provided propose a written solution for the problem based on the consumer scenario. Be specific by using dimensions or providing a detailed description of how products should function or look like along with mounting positions.

1.6 Provide two solutions with images, weblinks, and sketches that fulfill the proposed solution in 1.5.

Provide two solutions for the problem that comply with ADA and empathic design. One solution should be a new or different product that provides the same function along with its weblink. The other solution should be a sketch with mounting dimensions and how it interacts with other elements. Sketch e.g. if the grab bar was constraining the operable part of toilet paper holder, then make sure and show the grab bar as part of the solution.

1.7 Summary of Scenarios work sheet

1.7 Using the solutions from 1.5 and 1.6 for each consumer scenario, decide if one solution will solve the restroom item problem or if multiple solutions are required for all scenario consumers' needs to be met. For the ADA scenario, compare wheelchair bound and child caregiver scenarios. For regular stalls compare child caregiver, the traveler, and restricted use hands scenarios.

1.7.1 For each of the scenarios in the chart indicate yes with if any of the individual scenario solutions will work for all scenarios. Indicate with an if none of the individual scenario solutions will work for all scenarios.

1.7.2 Provide a final solution for all scenarios.

Provide a picture of the product, their weblinks, and a sketch with mounting dimensions and how it interacts with other elements. You may refer to the sketch versus inserting it into the blank and submit it separately, but ensure integration of materials is clear.

1.8 Addition Restroom Challenges work sheet

1.8 Provide solutions for other identified challenges in the restroom.

In the blanks provided, give the emotional response to the scenario and then provide two written solutions for the problem.

Presentation Method

This project is intended to build upon prior or concurrent knowledge learned about ADA. Prior to the assignment, instructors should review the definition and language of disability defined by the Americans with Disabilities Act. Further definition of specific disabilities could be used to help develop empathy for the topic. Resources

are provided under the reference section of this document that further define disabilities and impairments.

Empathic design is an observational research methodology that taps into the emotions consumers experience while interacting with products and processes to improve their design. To initially involve students in empathic learning the instructor might either bring in guest speakers or have students interview scenario specific consumers about the challenges they face in navigating public restrooms. If the speaker is willing, record the interaction for future use. Having and recording scenario specific consumers role play their interactions within a restroom setting would be ideal.

Prior to class time, students should become aware and build empathy on the topic by reviewing the provided materials on wheelchair users, parents with children, and general information about scenario specific and general topics about public restrooms. Instructors or students are encouraged to search for and provide the class with additional resources. At the time of this writing, gaps exist in video research of this nature, therefore, the video products created in this assignment may be used to further research on inclusively designed restrooms.

Wheelchair user videos

- BuzzFeedYellow (Producer). (2015, March 29). *What it's like to be a woman in a wheelchair* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=M0jrmmqBBZ8>
- Cowen, S. (Producer). (2013, January 4). *Sarah will wheelchair diagonal transfer to Wingman toilet seat* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=-b4jSu2aHvk>
- Paralyzed Living (Producer). (2014, May 27). *Opening doors from a wheelchair* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=ltQuPRAurng>
- Ng, A. (Producer). (2013, June 8). *A day in a wheelchair challenge* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=m9qRiSOFw3o>

Parents with Children

- Bologna, C. (2015, March 12). Sign banning boys over 6 from women's restroom stirs controversy. *Huffington Post*. Retrieved from http://www.huffingtonpost.com/2015/03/12/little-boys-womens-restrooms_n_6855746.html
- How to Redneck. (2015, February 17). *How to help kids wash their hands* [YouTube Video]. Retrieved from https://www.youtube.com/watch?v=MJV3_3vZawl
- Penny. (2015, February 18). *Our crazy adventures in autismland* [Web log comment]. Retrieved from

<http://ourcrazyadventuresinautismland.com/navigating-teen-years-autism-public-restrooms/>

WhatsUpMoms. (2013, September 16). *Potty training & public restrooms* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=p2Kc5iLaMwE>

General

Crazy Russian Hacker. (2013, October 31). *Sink life hack that will change your life* [YouTube Video]. Retrieved from <https://www.youtube.com/watch?v=KTY1MITC6hI&list=PLNaY8rHfeWRdyO4DnQ4k9nlz5ID2njwnR>

Doug M. (2015, June 18). [YouTube Video]. *Life hack toilet paper into 2ply*. Retrieved from https://www.youtube.com/watch?v=T_GnyE8AZA8

Howcast (Producer). (n.d.). *How to use a bidet* [Internet Video]. Retrieved from <http://www.howcast.com/videos/351816-how-to-use-a-bidet/>

Howcast (Producer). (n.d.). *How to use a public toilet without picking up a disease* [Internet Video]. Retrieved from <http://www.howcast.com/videos/235436-how-to-use-a-public-toilet-without-picking-up-a-disease/>

Merrill, S. (2010, March 6). *A call to arms: Reboot the public bathroom*. *TechCrunch*. Retrieved from <http://techcrunch.com/2010/03/06/a-call-to-arms-reboot-the-public-bathroom/>

Evaluation Evaluation guidelines are somewhat objective, but a rubric with a range of poor, good, and excellent could be used to evaluate the fulfillment of requirements.

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References Battarbee, K., Suri, J. F., & Howard, S. G. (2014, January 10). *Empathy on the edge: Scaling and sustaining a human-centered approach in the evolving practice of design*. Retrieved at

http://www.ideo.com/images/uploads/news/pdfs/Empathy_on_the_Edge.pdf

Nussbaumer, L. L. (2011). *Inclusive design: A universal need*. New York: Fairchild Books.

U.S. Department of Justice. (2010, September 15). *2010 ADA standards for accessible design* [Electronic version]. Retrieved from <http://www.ada.gov/regs2010/2010ADASTandards/2010ADASTandards.pdf>

U.S. Department of Justice. (2009). *A Guide to Disability Rights Laws*. Retrieved from <http://www.ada.gov/cguide.htm>

U.S. Department of Justice. (1991). *Code of federal regulations* [Electronic version]. Retrieved from <http://www.ada.gov/1991standards/adastd94-archive.pdf>

New York State Department of Labor Occupational Safety and Health Training and Education Program. (n.d). *DC 37 safety & health fact sheet: Disabilities and impairments defined* [PDF file]. Retrieved from http://www.dc37.net/about/graphics/factsheetpdf/disability_defined.pdf

Gender neutral bathroom resources

- Allen, R. (2015, May 14). Bathroom access for transgender woman at Baton Rouge courthouse causes stir. *The Advocate*. Retrieved from <http://theadvocate.com/news/12344284-123/bathroom-access-for-transgender-woman>
- Carrino, O. (2009, November 18). Controversy over gender-neutral bathroom sign reveals the subtleties of campus attitudes. *The Michigan Daily*. Retrieved from <http://www.michigandaily.com/content/family-bathroom-sign-replaces-gender-neutral-sign-union>
- Vanderhoff, M. (2015, March 2). Senate approves controversial public school bathroom bill. *WLKY.com*. Retrieved from <http://www.wlky.com/news/senate-approves-controversial-public-school-bathroom-bill/31523712>
- Wiesenthal, N. (2015, March 20). Controversial 'bathroom bill' leaves Florida transgender students, allies concerned. *USA Today*. Retrieved from <http://college.usatoday.com/2015/03/20/controversial-bathroom-bill-leaves-florida-transgender-students-allies-concerned/>

Appendix A1 Commercial Bathrooms Assignment Sheets

1.1 –1.6 Navigational work sheet

	Scenario type: (Wheelchair Bound, The Traveler, Child Caregiver, Restricted Use Hands)			Restroom area type: (regular stall, ADA stall, sink, entry)	Navigational hindrance tools: (wheelchair, suitcase, toddler scaled poseable doll in a stroller, or taped hand)	
	1.3.1 Provide video link here			www.videolink.com		
1.2 restroom items: fixtures & equipment	1.3.1 empathic user/ think aloud notes	1.3.2	1.3.3 Measure/ record	1.4 Identify cause	1.5 propose a written solution	1.6 Images for solutions
	Record empathic user comments (Guest speaker, video, and group scenario experience) in relation to the navigational hindrance tool. Transcribe below.	Provide the ADA image or code section number and paragraph that complies with the restroom item.	Measure existing conditions with an Imperial unit tape measure. Record dimensions in feet and inches on assignment.	Identify cause of navigational constraint.	Propose a written solution for the problem. Be specific.	Provide two solutions for the problem. Provide products, weblinks, and sketches.
1) restroom entry door from exterior						
2) toilet stall/ cubicle height						
3) regular stall length and width						
4) door width						
5) door swing						
6) door toe clearance						

7) latch type						
8) latch height						
9) toilet height						
10) toilet dimension from side wall						
11) flush valves						
12) toilet paper dispenser						
13) sanitary napkin disposal						
14) coat hooks						
15) flip-down shelves or holders						
16) child restraint seats						
17) diaper changing station						
18) sink						
19) mirror						
20) paper towel dispenser						
21) hand dryer						
22) garbage can						
23) sanitary napkin dispenser						
24) restroom door from exterior and						
25) restroom door from interior						

1.7 Summary of Scenarios work sheet – ADA Stall (Create an additional work sheet for the Regular Stall)

Using the solutions from 1.5 and 1.6 for all the scenarios, evaluate if one solution will solve the problem or if multiple solutions are required for all individuals needs to be met.

	1.7.1	1.7.1	1.7.1	1.7.2
Will one solution work for all role play scenarios? <input checked="" type="checkbox"/>				Provide a final solution for all scenarios.
Indicate with an "X" the extreme scenario that will not allow for one solution <input checked="" type="checkbox"/>	Wheelchair Bound ADA stall	Child Caregiver ADA stall		
1) restroom entry door from exterior				
2) toilet stall/ cubicle height				
3) regular stall length and width				
4) door width				
5) door swing				
6) door toe clearance				
7) latch type				
8) latch height				
9) toilet height				
10) toilet dimension from side wall				
11) flush valves				
12) toilet paper dispenser				
13) sanitary napkin disposal				
14) coat hooks				
15) flip-down shelves or holders				
16) child restraint seats				
17) diaper changing station				
18) sink				
19) mirror				

20) paper towel dispenser				
21) hand dryer				
22) garbage can				
23) sanitary napkin dispenser				
24) restroom door from exterior				
25) restroom door from interior				

1.8 Addition Restroom Challenges work sheet

Provide solutions for other identified challenges in restroom design.

Problems found	emotional response or possible behavioral outcomes	2 Solutions to solve the problem
1) accidental exposure though cracks in toilet partitions		
2) having to look under a stall to discern if it is occupied		
3) purposive peeking through cracks		
4) picture or video taking through cracks		
5) door and stall heights that you can see over		
6) stalls without doors		
7) inadequate or broken locking mechanism on partitions		
8) sanitary napkin trash in floor		
9) no sanitary napkin holder in the stall		
10) odors from the sanitary napkin disposal		

11) toilet dispensers that limit the flow		
12) no door hooks or flip down trays		
13) children crawling under partitions		
14) boys 7 to 10 in women's room		
15) fathers who are forced to take their girls 0- 6+ into the men's room.		
16) single mothers with boys entering kindergarten who have not seen a urinal and need to be taught how to use it		
17) paper towels thrown down at door		
18) unflushed toilets or broken toilets		
19) water pooled on sink		
20) soap dripped on counter		
21) soap and water splashed from sink onto mirror		
22) transgender individuals who deserve to feel safe and unquestioned when using the restroom		
23) Mothers and fathers who stand at the opposing gender door		
24) ??? others ????		