Accessibility of Push Plates

Courtney Smith
January 19th, 2018

Introduction

Imagine being suck outside in the rain or blistering wind and not being able to open the door into any building. This often happens to someone with a physical disability that limits their strength and dexterity. Now image having a disability and feeling the slight joy associated with a button that opens a door for you. Those joyous buttons are push plates. A push plate is a type of ADA door opening system, as shown in Figure 1, and is a user interface that meets the need of a large under represented population.

Figure 1 [11]: Varying types of interfaces for ADA door opening systems

ADA stands for the Americans with Disabilities Act and is in place to provide accessibility to public spaces for those with disabilities. Even though ADA door opening systems "are not required by the ADA Standards" they provide much greater accessibility to the disabled community [5]. While ADA laws allow equal access, most spaces are not truly considered accessible by the disabled community unless they do go above and beyond ADA laws.

Push plate interfaces are buttons placed near a door, often on the exterior of buildings, that when pressure is applied trigger a mechanism attached to a door. The mechanism triggered then unlatches and opens the door, holding the door open for a set period of time, allowing someone to enter or exit.

Even with the flaws present in the design and installation of push plates, they do enable user empowerment and independence. This report discusses the history of push plates and the methods of evaluating push plates, such as physical accessibility, functionality, and necessity. This report then goes into a discussion of the user interface itself and ends with a conclusion, recommendations for the improvement of push plates, and references.

Background

In the summer of 1990, the Americans with Disabilities Act became one of many civil rights laws. The ADA laws are in place to prohibit "discrimination on the basis of disability in employment, state and local government programs, public accommodations, commercial facilities, transportation, and telecommunications" [2]. Even though accessible ADA door opening systems, such as push plates, are not required to be installed under ADA laws, they are one of the staples of an accessible building [7].

Push plates are often large silver circles or squares with a blue painted and engraved symbolic depiction of an empty wheelchair, as shown in Figure 2. When pressure is applied to the push plate, a signal is sent to a device attached to a door which then unhinges the door and swings it open. Push plates are often placed outside of the swing of the door being opened and there is typical a push plate on both the outside and the inside of the door being opened. These push plates can be installed for doors both on the exterior of buildings for overall entry and the interior of buildings for entry into individual rooms.

Figure 2 [10]: Examples of push plates

Push plates are helpful to many members of society. They are there for use by anyone, including someone carrying a heavy load, a large group of people, or a disabled member of the community [7]. Some members of the disabled community do not have the ability to apply the force necessary to activate push plates, of that subset of the community some members have service animals that are specifically trained to use their nose or paws to activate push plates.

Methods

While there are many criteria by which to judge push plates, the criteria being focused upon in this report are the physical accessibility of the plates, the immediate functionality of the plates, and the necessity of using an ADA door opening system.

Physical Accessibility

One of the main criteria to be taken into account when assessing push plates is the physical accessibly of the plate itself. In order for the plate to be accessible to a disabled user it must be at an appropriate height for someone of short stature or using a wheelchair. The plate must also be placed free of obstructions, such as railings and must not be too near the door to avoid the user being hit by said door [1]. Another factor of physical accessibility is the physical force required to activate the push plate. The push plate must have a low enough resistance that a user with limited strength or dexterity can push the plate with enough force to activate it.

Immediate Functionality

Another criteria for assessing push plates is their immediate functionality and the effect that has on the user. A user must have a clear understanding of not only what the push plate does but what door it is designated to open. In order for the push plate to be effective it must have a clear indication, whether by placement or graphical representation, of the door that will be opened when pressure is applied. Another feature that factors into the criteria for the immediate functionality of a push plate is the speed at which the door opens. The push plate must activate the door at a high enough speed that the user does not have time to reach the door before closure. The push plate must also not delay the door's activation to were the user's routine or goal is interrupted by a prolonged waiting period [9].

Necessity

Necessity also needs to be taken into account when evaluating a push plate. If the doorway is heavily trafficked it might be more efficient to put motion sensored automatic doors in place. If the door does not have heavy traffic it might not be efficient to have any form of ADA door opening system. The use of the door by those with disabilities also needs to be taken into

account. If the door is physically inaccessible it would not be logical to place a push plate. Due to ADA door openers and push plates not being required by law to be installed in new construction, it is up to the builder and designers to choose whether ADA door opening systems get installed.

Results and Discussion

Push plates are meant to provide physical accessibility for those who are disabled, but are not completely accessible to the disabled population. ADA door opening systems help the disabled in theory, but do not always work in practice.

Accessibility, Functionality, and Necessity

If a push plate is placed in a physically accessible location is can be very useful. Unfortunately, aesthetics are often prioritized over practicality. This prioritization leads to push plates being placed behind railings, too close to doors, or the worst of all too tall for someone in a wheelchair to use. If a push plate is in a physically accessible location, it will require an undetermined amount of force to activate. For some push plates, a gentle gust of wind will activate them. Other push plates require the force of a sledgehammer to activate.

Typically, when there are multiple sets of doors to enter a building one of them will be equipped with a push plates. The door chosen is often on the end of the row of doors, out of the way of other doors. But, there is still a great amount of uncertainty that goes into using the push plates to open the door. Some plates only open one door, some open both doors in a double door entry, some open one door and then the other, some the door must be fully closed before it will activate, some will activate even if the door is half open already. There is an extreme amount of uncertainty when it comes to using push plates. That uncertainty could be solved with better designed graphic representations on the push plates themselves.

Many people do not design with a diverse population in mind. Unless a product is specifically being designed for people with disabilities, they are often left out of user groups. While a designer may not see a push plate as necessary, someone in a wheelchair may depend on it.

Empowerment and Use

The idea that a simple button can solve a problem is wonderful in theory, but does not truly work in practice. When a push plate is installed correctly and meets all the aforementioned criteria, it is an effective addition to someone's life. Figure 3 shows how a disabled person can access the outside world with the push of a button. Push plates reduce the mental stress and embarrassment put upon a disabled person. Push plates reduce this mental stress by not making then wait in inclement weather or disrupting a meeting with a knock. Push plates are a convenience that the everyday person takes advantage of and can be useful when pushing a cart or stroller. Users, disabled or not, have no need to clumsily struggle with a heavy door and can feel a small sense of efficiency and

Figure 3 [8]: Person in a wheelchair using a push paddle to exit a building

empowerment when interacting with a push plate. With every advancement in technology, disabled persons are reaching new levels of independence.

Conclusion

Push plate interfaces of ADA door opening systems are both hard to find and obnoxious, too tall and too short, not sensitive enough and overly sensitive. They were design for people with disabilities but not designed with people with disabilities. In order for an interface and device to be effective for users of a set population they must be designed with those users. To have users involved in the design process and to design for user empowerment is to design well.

Overall, even though push plates were not designed with members of the disabled community they do improve the life of the user.

Recommendations

There needs to be a stricter set of standards for the insulation and use of push plates. Many push plates are installed and forgotten about until someone speaks up to get a broken push plate fixed. This design of the durability of push plates must be improved as to better service the user. The design of the graphics represented on the push plates also need to be updated, to not only clarify the use of the push plate but to use an updated symbol that represents a disability as more than a blue empty wheelchair.

References

[1] "The Ins and Outs of Automatic Door Operation, by Michael Panish - The Nation's Leading Automatic Door Injury Expert Witness." [Online]. Available: http://www.constructionwitness.com/Published-Articles/Automatic-Doors-Sensors/The-Ins-Outs-of-Automatic-Door-Operation.aspx. [Accessed: 16-Jan-2018].

[2] "The ADA National Network Disability Law Handbook | ADA National Network." [Online]. Available: https://adata.org/publication/disability-law-handbook. [Accessed: 16-Jan-2018].

[3] B. McClure, "Stairway to Heaven: A closer look at the inclusiveness and accessibility of the United Methodist Church," 2008.

[4] C. Riley and B. Wales, "Reality Check," *College & Undergraduate Libraries*, vol. 9, no. 1, pp. 41–48, Jun. 2002.

[5] "Opening Doors To Everyone | ADA National Network." [Online]. Available: https://adata.org/factsheet/opening-doors-everyone. [Accessed: 16-Jan-2018].

[6] "Compliance of the Americans With Disability Act- ClinicalKey." [Online]. Available: https://www-clinicalkey-com.offcampus.lib.washington.edu/#!/content/playContent/1-s2.0-S0736467913011530?returnurl=null&referrer=null. [Accessed: 16-Jan-2018].

[7] "Automatic Door Openers: Required or Not Required?," *MOD Blog*, 04-Sep-2015. .

[8] "Automatic & Handicap Door Opener Toronto | Protection Plus," 30-Dec-2015. .

[9] A. Perr, "Adaptive Equipment:: Freedom and Independence for People with Disabilities," *Journal of Religion in Disability & Rehabilitation*, vol. 1, no. 1, pp. 81–87, Jan. 1994.

[10] "ADA Compliant Solutions." [Online]. Available: http://www.sdcsecurity.com/ADA-Compliant-Solutions.htm. [Accessed: 15-Jan-2018].

[11] "Activation Options | Access Technologies." [Online]. Available: http://www.stanleyaccess.com/activation. [Accessed: 15-Jan-2018].

[12] D. Dowler, L. Batiste, and E. Whidden, "Accommodating workers with spinal cord injury," *Journal of Vocational Rehabilitation*, vol. 10, no. 2, pp. 115–122, Jan. 1998.

[13] "Abstracts Database - National Criminal Justice Reference Service." [Online]. Available: https://www.ncjrs.gov/App/abstractdb/AbstractDBDetails.aspx?id=202303. [Accessed: 16-Jan-2018].