INCLUSIVE DESIGN ASSESSMENT OF STATE PARK BUILDINGS IN MICHIGAN FOR THE ELDERLY: AN EMPIRICAL STUDY USING CASE STUDIES AND FOCUS GROUP

By

Rabia Faizan

A THESIS

Submitted to
Michigan State University
in partial fulfillment of the requirements
for the degree of

Environmental Design – Master of Arts

2018

ABSTRACT

INCLUSIVE DESIGN ASSESSMENT OF STATE PARK BUILDINGS
IN MICHIGAN FOR THE ELDERLY: AN EMPIRICAL STUDY
USING CASE STUDIES AND FOCUS GROUP

By

Rabia Faizan

State parks are source of recreation and relaxation for people of all ages and abilities. The built facilities on these parks play a significant role to facilitate the visitors and define their overall experience. Thus, it is important to have knowledge about human context and varied needs of users to make these facilities inclusive and satisfactory for diverse visitors. Currently state park buildings follow ADA guidelines which are limited in providing accessibility to wide variety of visitors. Thus, there is a need to go beyond ADA guidelines to state park buildings more inclusive.

In light of the research need mentioned above, this study aimed at examining the current accessibility conditions of state park buildings in Michigan along with user perceptions about their inclusiveness. The study was divided into two phases. In the first phase, six buildings in three state parks of Michigan were assessed using an inclusive design assessment tool. In the second phase, perceived accessibility of the users regarding buildings in one of the state parks was measured using a focus group of nine senior citizen participants. In addition to giving their satisfaction level regarding different design features of the built facilities, focus group participants also provided with several recommendations to improve inclusiveness of the facilities. The findings of the study indicated that even the buildings complying with ADA guidelines did not meet the needs of the focus group participants completely. This reinforce that ADA guidelines, which are minimum requirements for design of state park buildings, are not enough to satisfy the needs of diverse users.

The study has significant theoretical and practical outcomes. The theoretical contribution of the study includes development of tool for assessing accessibility of buildings. The practical contributions include recommendations for designers to improve inclusiveness of buildings and include the user feedback as much as possible in this regard.

I dedicate this thesis to my late grandfather who taught me love, compassion and hard work.
May his soul rest in peace.

ACKNOWLEDGEMENTS

Completion of this dissertation is truly a dream come true. Allah has blessed me with more than I ever imagined. I was too weak to accomplish this on my own. I am lucky to have amazing family, friends and mentors in my life. They were a constant source of comfort, support and guidance in my journey.

I am extremely grateful to Dr. Suk Kyung Kim for believing in me and taking me under her kind supervision despite my ordinary profile. It was only because of her confidence and trust in my abilities that I was able to pursue a master's degree. She is truly an inspirational leader, who transformed me into a confident student and researcher, and for which I will be obliged forever.

I would also like to extend my profound gratitude to my committee members: Professor Tim Mrozowski, Dr. Linda Nubani, and Dr. Pat Crawford. Their generous investment of time and effort has played a major role in shaping my work. I couldn't have asked for better advisers.

I am pleased to mention my friends at school: Angelo, Leah, Jake, and Mohsen. They have all been there all along to cheer me up. Especially Angelo, who was always there to listen, help, and encourage. Also, the staff at the school: Jill, Janelle, and Pat, who were super cooperative and made all the processes smooth for me.

I'd like to thank my entire family for always keeping me in their prayers. Especially my parents who raised me to the best of their abilities and gave special consideration to my education. Last semester when I got sick, they flew within a couple of days from the other side of the world to attend me. I wouldn't have been able to finish my dissertation on time had they not come. Also,

my mother and father in law, who are equally supportive and caring. Their well-wishes and nurture has strengthened me to keep moving in life and grow.

Finally, and most importantly, I share this accomplishment with my dear husband, Faizan. He is the most beautiful and caring soul I have ever known, and I feel blessed to have him by my side for life. He is my Patronus, my Genie, and my Knight in shining armor. His love has brightened me, my life, and everything in it.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1: INTRODUCTION

1.1 Background

Accessibility has been emphasized a lot in past few decades. Both national and international laws highlight its importance in buildings and other type of facilities. In the United States alone the existence of several laws, that include, Architectural Barrier Act of 1968, the Rehabilitation Act in 1973, Americans with Disability Act in 1990 highlight the importance of accessibility (United States Department of Justice, 2009).

The changing trends in policies and increase pressure on designers regarding accessibility is because of the changing demographics in the world. According to a report by world health organization (2011), the percentage of people over 65 years is continuously increasing worldwide, due to increase in life expectancy and decrease in fertility rate. This increase in older population, although highlights the improvement in the field of medicine, it also creates a challenge to ensure social participation of aging population (Heylighen, Linden, & Steenwinkel, 2017).

Unlike 20th century, both disabled and old people aspire to participate in the main stream society independently. Furthermore, a big consumer group (i.e., baby boomer generation) which controls a large amount of disposable income is also making the industry and designers to change their trends towards being more inclusive in their designs (Clarkson, Coleman, Keates, & Lebbon, 2003). Clarkson et al. (2003) in their book titled, "Inclusive Design- Design for Whole Population" presents that there is a growing trend in recognizing age, and disability as something that will be experienced by everyone. This development in the field has also "shifted the focus from them - the elderly and disabled in academic parlance - to the us" (Clarkson & Coleman, 2015).

Various design concepts have been introduced worldwide to achieve accessibility. These include accessible design (Americans with Disabilities Act, 1991), design for all (EIDD, 2004), barrier free design (Center for Universal Design, 2008), universal design (Mace, 1985) and so on. All these approaches vary in history, but have similar goal (Persson, Åhman, Arvei, & Gulliksen, 2015). Inclusive design is adopted for the present research because of its impression of including rather than excluding and its evolution in considering diversity, not just in terms of age and ability, but also in terms of social and cultural differences, gender, and sexuality (Heylighen, Linden, & Steenwinkel, 2017).

In 2007, the United States alone had 11 million people with age 6 years or older who needed assistance to carry out everyday tasks (Nussbaumer, 2011). Regardless of disabilities, these people have equal rights to participate in different activities (United States Department of Justice, 2009) because participation in social activities can have positive affect on their life satisfaction (Fänge, Iwarsson, & Persson, 2002). To provide the opportunities for social and physical participation, there are several public facilities that exist and are supposed to comply with ADA guidelines by Law.

Among numerous public facilities that are source of public participation in social or physical activities, state parks are one of the biggest sources. According to National Association of State Park Directors (2017), the United States had 10,336 state parks covering an area of 18,597,527 acres in 2016. These parks contain 9,457 cabins and cottages, and 161 lodges among several other amenities. Out of these, Michigan alone has 100 state parks having millions of visitors each year highlighting the fact that Michiganders are outdoor enthusiasts. These state parks have several historic and new structures that provide opportunities for comfort and enjoyment

through access to ecological, cultural, historic, and prehistoric assets (The Michigan State Parks and Outdoor Recreation Blue Ribbon Panel, 2012).

The Michigan Department of Natural Resources (DNR) is the body responsible for maintaining state parks. In 2011, Michigan was awarded the National Recreation and Park Association's Gold Medal for the top state park system in the nation (The Michigan State Parks and Outdoor Recreation Blue Ribbon Panel, 2012). In 2013, DNR was awarded a grant to fund recreation projects that take accessibility in state parks and state park facilities beyond ADA (Michigan Department of Natural Resources, 2013). Since laws are the minimum requirements set forth to make an environment barrier-free for people with disabilities (Clarkson et al., 2003), DNR adopted universal design and developed a checklist composed of guidelines regarding design considerations for several amenities to assess their park facilities.

To conduct present study, inclusive design has been adopted as it is believed to be a broader concept than universal design (Nussbaumer, 2011). It also complements the goal of DNR to ensure equal access of natural resources to all the visitors, regardless of their physical abilities (Michigan Department of Natural Resources, 2013). In order to meet this goal, designers or decision makers first need to understand diverse user abilities. It has been found that designers believe that they have best knowledge about the needs of end users without developing any empathy with them. Since designers are supposed to demonstrate that the needs of diverse end users are not just being considered, but also acted upon, it's very important for them to first develop this empathy.

To understand user interaction with a product in any environment, interaction with end user is a very useful tool and is the first step towards effective inclusive design (Clarkson et al., 2003). There are several tools used to understand user needs or to interact with them. One such device is focus group (Clarkson et al., 2003). It is a very useful tool, since focus group is considered a

representative of the whole population (Breen, 2006), and provides an opportunity for "in-depth discussion and exploration of issues" (Clarkson et al., 2003).

1.2 Need for the Study

State parks were created to provide people with an opportunity to take rest from their busy city lives and find relief in nature. The idea was to understand human context and use that knowledge to provide every visitor with an access to ecological, cultural, historic, and prehistoric assets (The Michigan State Parks and Outdoor Recreation Blue Ribbon Panel, 2012). State parks have several built facilities that contribute significantly towards the overall experience of visitors coming to state parks in search of relief. As comfort and satisfaction of visitors is one of the primary goals of state parks, the design of facilities should cater the needs of people of all kinds. It is, therefore, important to have knowledge about human context and diverse needs of users to make these facilities inclusive and satisfactory for diverse visitors of state parks.

1.3 Purpose and Specific Objectives of the Study

The primary purpose of this research is to examine the accessibility conditions of state park buildings in Michigan along with user perceptions regarding their inclusiveness. These findings will facilitate to understand actual desires of the users and design aspects that affect their satisfaction levels. The ultimate goal of this study is to facilitate existing park buildings to support various types of users and improve inclusiveness in their exterior and interior spaces.

To achieve this purpose, the study set forth specific objectives as follows:

1. To analyze literature thoroughly about different design approaches targeting accessibility in public buildings and choose the best approach for this study.

2. To compile design guidelines regarding building design that promote inclusiveness in buildings. Using these guidelines, develop an assessment tool to evaluate state park buildings in Michigan.
3. To measure actual and perceived accessibility in state park buildings in Michigan and compare between actual and perceived accessibility, using the data from case studies and a focus group using elderly participants.
4. From the findings of both actual and perceived accessibility, suggest significant design recommendations to meet users' needs for improving inclusiveness in state park buildings.

1.4 Significance of the Study

There exists a gap between designer's understanding regarding diverse user needs about accessibility and inclusiveness in buildings and spaces, and the actual desires of end users (Clarkson et al., 2003). This research will help fill this gap and will facilitate designers and decision makers in understanding the importance of getting user perception and opinions in this regard. This understanding and knowledge will ultimately result in an inclusive built environment particularly for state park buildings to improve an overall experience for every state park visitor.

1.5 Scope of the Study

Inclusive design promotes inclusiveness for diverse user groups. It is, therefore, important to have knowledge about different needs of various users. The scope of this study is however, limited to elderly visitors of state park buildings. A focus group having senior citizen as participants is utilized in this study. Similar studies should be conducted having varied focus groups to broaden the database regarding diverse needs of users. This would facilitate to promote inclusiveness of state park buildings.

CHAPTER 2: LITERATURE REVIEW

2.1 Historic Background of Accessibility Efforts in UK and USA

2.1.1 Welfare State in the United Kingdom

In UK, profound changes occurred in last 200 years, that led towards the creation of welfare state (Clarkson et al., 2003). The end of Second World War brought significant changes with it. People who suffered in the war increased their expectations regarding social and political justice (Clarkson et al., 2003). Moreover, with a long desire to attain peace, society gradually started moving towards unification and inclusion (Clarkson et al., 2003). Furthermore, recent scenario of European Union has also led towards inclusion of diverse groups and respect of cultural pluralism to avoid conflicts (Clarkson et al., 2003).

2.1.2 Civil Rights in the United States

In America, Civil rights movement started in 1950's with the aim to attain equal rights, and to end discrimination against African Americans (Clarkson et al., 2003). Later on, this movement provided model for disability movement (Clarkson et al., 2003). Post-World War II era is most significant in terms of bringing significant changes regarding disability rights (Clarkson et al., 2003). Because of the efforts of disability advocates, the American National Standard Institute (ANSI) passed the first set of guidelines in 1961 to ensure accessibility of disabled people into public buildings (ANSI: ICC A117.1). Most significant acts that were passed in addition to this include, the Architectural Barrier Act in 1968, the Rehabilitation Act in 1973 and the Education for All Handicapped Children in 1975. All these acts, later on paved way for the Americans with Disability Act (ADA) in 1991(Nussbaumer, 2011).

2.2 Accessibility

The existence of several nondiscrimination laws around the world highlights the importance of accessibility (Persson et al., 2015). The important question, therefore, is not about its importance, but about the ways to achieve it. There are several approaches that exist aiming to make products more accessible (Persson et al., 2015). These include accessible design, design for all, barrier-free design, universal design, lifespan design, transgenerational design, and inclusive design (Nussbaumer, 2011).

2.2.1 Accessible Design

The ADA (Americans with Disability Act) standards were first published in 1991 and the term "accessible design" was derived from those guidelines (Americans with Disabilities Act, 1991). With the evolution of the guidelines, the definition of accessible design has also evolved accordingly. In 1991, it was defined as the design of any product or environment that meets the legal requirements as mentioned in codes in order to facilitate people with disabilities (Center for Accessible Housing, 1991; Story, 1998). Since the definition has changed with time, in ISO's guide 71:2014, it is defined as "the design focused on diverse users to maximize the number of potential users who can readily use a system in diverse contexts." Although the definition of the term changed over time, but it was initially introduced to cater the issues of a very focused target group such as the people with disabilities (Nussbaumer, 2011).

2.2.2 Design for All

The term "design for all" was coined by the European Institute for Design and Disability (EIDD), which later, in 2006, changed its name to EIDD-Design for all Europe. In Stockholm Declaration 2004, EIDD advocated that Europe has grown a lot in terms of human diversity (EIDD Stockholm Declaration, 2004). To cater the needs and vast abilities of people, the principle of

inclusion should be incorporated in every design. Therefore, EIDD defined design for all as "the design for human diversity, social inclusion, and equality" (EIDD Stockholm Declaration, 2004).

According to design for all movement, the aim is to provide equal opportunities to people to participate in various activities and in society, as a whole (EIDD Stockholm Declaration, 2004). It dictates that "everything that is designed and made by people to be used by people – must be accessible, convenient for everyone in society to use and responsive to evolving human diversity" (EIDD Stockholm Declaration, 2004). The concept design for all has been used by many national and international bodies as a goal. For example, The Design for All Foundations founded in 2001, Swedish government also used it as a goal to make Sweden accessible for all people in 2010 (Social Departementet, 2000).

2.2.3 Life Span and Transgenerational Design

Lifespan and transgenerational design are very similar concepts (Nussbaumer, 2011). The term "transgenerational design" was introduced by the Professor James Pirkl in 1991 (Pirkl, 1991). The idea behind the concept was that the demographics of U.S. population are continuously changing. The average age is increasing and people have more life expectancy than before, therefore, it is needed to incorporate the needs of all the varied age groups in product design (Pirkl, 1991).

Both life span and transgenerational design rejects the idea of targeting older population as the core consumers because it is difficult to define or differentiate between young and old age (Nussbaumer, 2011). Pirkl (1991), however, says that ageing is a relative process, and it depends on many factors. Some gets old at 75, while others get old at 40, and everyone has his own pace of aging, therefore, it is responsibility of designers to incorporate needs of all age groups in product design (Pirkl, 1991).

2.2.4 Barrier-Free Design

Barrier free movement started in 1950's, when people with disabilities, especially veterans returning from war demanded equal rights (Clarkson et al., 2003). Physical barriers in the buildings were identified as major issue regarding equal opportunities (The Center for Universal Design, 2008). The efforts of various disabled veterans and their advocates to make buildings barrier-free took shape in 1961, when American National Standard Institute (ANSI) passed its first set of guidelines titled, "A 117.1 — Making buildings accessible to and usable by the physically handicapped" (ANSI:ICC A117.1). Tremendous developments were seen after 1961 in terms of various acts that were passed to ensure equal opportunities to disabled individuals (United States Department of Justice, 2009).

The barrier- free movement had a very distinguished target group (i.e., disabled individuals). As progress and implementation of laws started, designers realized that incorporation of separate accessible features in the design in even more expensive and usually ugly. It was also realized that these design features were beneficial for everyone, not just for disabled individuals. The idea that products would be less expensive and more beneficial for everyone when accessible design features are incorporated in their design, laid the foundation for universal design (The Center for Universal Design, 2008).

2.2.5 Universal Design

A well-known architect, product designer and an educator, Ronald Mace introduced the term "universal design" in 1985. He defined it as "… simply a way of designing a building or facility at little or no extra cost so it is both attractive and functional for all people disabled or not" (Mace, 1985).

Through this definition, Mace reflected a desire to design buildings in a way that the design does not highlight disabilities of people as special needs (Hamraie, 2013). To elaborate and explain universal design further, Ronald Mace along with the experts at North Carolina State University's Center for Universal Design redefined universal design as "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design." (Hamraie, 2013; Nussbaumer, 2011; The Center for Universal Design, 2008).

Another definition was proposed by a professor at University of Wisconsin Madison, Vanderheiden in 1996 as "the process of creating products (devices, environments, systems, and processes) which are usable by people with the widest possible range of abilities, operating within the widest possible range of situations (environments, conditions and circumstances)." (Vanderheiden, 1996; Nussbaumer, 2011). This definition shows a more practical approach of designing i.e., for people with widest possible range of abilities.

The concept of universal design was further elaborated with the help of seven principles of universal design. These are shared in Table 1.

Table 1. Principles of universal design

	Principles	**Design Guidelines**
1	Equitable Use: The design is useful and marketable to people with diverse abilities.	1. Provide the same means of use for all users: identical whenever possible; equivalent when not. 2. Avoid segregating or stigmatizing any users. 3. Provisions for privacy, security, and safety should be equally available to all users. 4. Make the design appealing to all users.
2	Flexibility in Use: The design accommodates a wide range of individual preferences and abilities.	1. Provide choice in methods of use. 2. Accommodate right-or left- handed access and use. 3. Facilitate the user's accuracy and precision. 4. Provide adaptability to the user's pace.

Table 1. (cont'd)

3	Simple and Intuitive Use: Use of the design is easy to understand, regardless of the user's experience, knowledge, language skills, or current concentration level.	1. Eliminate unnecessary complexity. 2. Be consistent with user expectations and intuition. 3. Accommodate a wide range of literacy and language skills. 4. Arrange information consistent with its importance. 5. Provide effective prompting and feedback during and after task completion.
4	Perceptible Information: The design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities.	1. Use different modes (pictorial, verbal, tactile) for redundant presentation of essential information. 2. Provide adequate contrast between essential information and its surroundings. 3. Maximize "legibility" of essential information. 4. Differentiate elements in ways that can be described (i.e., make it easy to give instructions or directions). 5. Provide compatibility with a variety of techniques or devices used by people with sensory limitations.
5	Tolerance for Error: The design minimizes hazards and the adverse consequences of accidental or unintended actions.	1. Arrange elements to minimize hazards and errors: most used elements, most accessible; hazardous elements eliminated, isolated, or shielded. 2. Provide warnings of hazards and errors. 3. Provide fail safe features. 4. Discourage unconscious action in tasks that require vigilance.
6	Low Physical Effort: The design can be used efficiently and comfortably and with a minimum of fatigue.	1. Allow user to maintain a neutral body position. 2. Use reasonable operating forces. 3. Minimize repetitive actions. 4. Minimize sustained physical effort.
7	Size and Space for Approach and Use: Appropriate size and space is provided for approach, reach, manipulation, and use regardless of user's body size, posture, or mobility.	1. Provide a clear line of sight to important elements for any seated or standing user. 2. Make reach to all components comfortable for any seated or standing user. 3. Accommodate variations in hand and grip size. 4. Provide adequate space for the use of assistive devices or personal assistance.

Note: Copied from Center for Universal Design. (1997). The principles of universal design. NC State University. The Center for Universal Design. Retrieved on 24th October 2017 from https://projects.ncsu.edu/www/ncsu/design/sod5/cud/about_ud/udprinciplestext.htm

2.2.6 Inclusive Design

The term “inclusive design” originated from UK and was introduced by Roger Coleman in 1993 (Coleman, 1994). This concept emerged because of several initiatives that were introduced in UK since 1960’s (Clarkson & Coleman, 2015). These initiatives include Equal Pay Act 1970, the Sex Discrimination Act 1975, the Race Relations Act 1976, and the Disability Discrimination Act 1995 etc.

In 1994, Coleman presented a paper at the 12th Triennial Congress of the International Ergonomics Association in Toronto in Canada with a conclusion that: “fresh approaches of the kind referred to here are needed to bridge the present gulf between mainstream design and design for the elderly, especially with regard to the scale of demographic change…As attitudes towards ageing and disability change an important role is emerging for ergonomics in the design and assessment of everyday products and environments, to ensure that they allow for the broadest possible range of abilities in their user profiles.” (Coleman, 1994). Inclusive design acknowledges the fact that no design will be perfect for everyone (Heylighen, der Linden, & Steenwinkel, 2017). and “help [manufacturers and retailers] see potential commercial benefits for their businesses’, along with ‘examples of how that concept could be applied in practice” (Coleman, 1994).

Although both inclusive and universal design have many similarities, one of the major difference that exists between both is evident from this definition of this inclusive design by the British Standards Institute (2005), “The design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible ... without the need for special adaptation or specialized design.”

The phrase “reasonably possible” indicates the commercial side of inclusive design approach and highlights the idea of “design exclusion” (Heylighen et al., 2017). Inclusive design

believes in the exclusion of the needs of some people from product design, if it is difficult or expensive to achieve (Persson et al., 2015; Heylighen et al., 2017). This is a very distinctive characteristic of inclusive design and emphasizes on having complete understanding of user diversity in order to make better design decision with maximum user group.

Clarkson and Coleman (2015) advocates that inclusive design is opposite of earlier design approaches and instead of treating elderly and disabled as separate groups having "special needs," it incorporates them in the mainstream of society. This is because, it believes that being able-bodied is a temporary state in everyone's life (Heylighen et al., 2017). Everybody does experience disability at some point. This disability can be temporary (i.e., becoming pregnant, having a fracture etc.) or permanent (i.e., getting old). Therefore, the disabled should not be treated as separate groups in design having special needs. Instead, everyone should be treated equally in design (Heylighen et al., 2017). In other words, it shifts" the focus from THEM-the elderly and disabled in academic parlance-to US" (Clarkson & Coleman, 2015). Clarkson and Coleman (2015) also believe that disability can arise from inadequate design of products and environment as well. Another important evolution in inclusive design is the inclusion of diversity, not just in terms of age or ability, but also "cultural and social differences, gender, sexuality and the intersection thereof" (Heylighen et al., 2017).

Inclusive design promotes equal participation of every individual. To achieve this, the Commission for Architecture and Built Environment (CABE) introduced five key principles of inclusive design (CABE, 2006).

1- Inclusive design places people at the heart of the design process:

This means to involve as many people as possible in the design process. Including majority and meeting their needs will help in making communities sustainable along with promoting well-being of the users.

2- Inclusive design acknowledges diversity and difference:

Recognizing diversity of people in terms of their abilities and needs in the design. For example, not just meeting the needs of wheel-chair users, but also of people having learning, hearing, visual or sensory impairments.

3- Inclusive design offers choice where a single design solution cannot accommodate all users:

Inclusive design acknowledges diversity and accommodates needs of various user groups in design.

4- Inclusive design provides for flexibility in use:

This principle aims at having a complete understanding regarding the user group and ways in which a space will be used. This is important to meet the diverse and changing needs of the space.

5- Inclusive design provides buildings and environments that are convenient and enjoyable to use for everyone:

To facilitate the users, there should be proper provision of information to users, even prior to their visit so that they feel comfortable while accessing the built environment. Inclusive design includes every stakeholder in the design process along with the users of the product or built environment. It means that in addition to the design team (designer, contractor) taking input from the users is a very important part of inclusive design. User groups should also be incorporated in

the design process to have a better understanding of their needs while making the design inclusive (CABE 2006; Heylighen et al., 2017). After following the above-mentioned principles of inclusive design, the end product will be inclusive, responsive, flexible, convenient, accommodative, welcoming and realistic (CABE, 2006).

2.3 Inclusive Design versus Universal design

Both universal and inclusive design aim at a goal higher than previous design approaches, because previous approaches had the specified target group. For example, transgenerational design aimed at incorporating aging in design while barrier free design aimed at eliminating physical barriers in built environment for disabled individuals. Also, accessible design (introduced by ADA) aimed at complying with codes related to disability guidelines and so on.

To find out which of these two is better to adopt has been an ongoing debate. Many researchers or practitioners believe that both have nearly same meaning and can be used interchangeably. Whereas, Dr. Scott Rains, a consultant on travel and disability, believes in inclusive design because it is a broader concept than universal design because "it also embraces diversity in social and economic circumstances" (Nussbaumer, 2011, p.34).

Both universal and inclusive design believe that needs of diverse user group should be incorporated in design. But, opposite to universal design, inclusive design admits that it is realistically impossible to design for entire population and acknowledges the idea of "design exclusion." The idea of choosing target market and making well informed decisions make inclusive design more likeable by business and industry. Moreover, it can be called realistic as compared to universal design, which is described as "a discrete form of design with its own principles" (Clarkson & Coleman, 2015) having "no practical limits" (Vanderheiden, 2009).

Consideration of ADA disability guidelines is a part of both approaches, but these approaches go much beyond. However, Ostroff (2001) pointed out that "the term universal design has been inappropriately adopted by some architects, especially in the US, as a trendy synonym for compliance with the Americans with Disabilities Act." This can also create confusion for many to understand or relate to the term universal design.

2.4 Strategies to Make Projects Inclusive

The very first principle of inclusive design puts people at the heart of design, therefore it is very important to have a complete knowledge of their needs. In building design, these people include potential users or visitors of the building. Nussbaumer (2011) talks about several assistive devices and approaches that have been developed to incorporate inclusive design into the design project. These devices include research and user participation in design process.

2.4.1 Research for Inclusive Design Projects

Nussbaumer (2011) says that for any design product or environment, it is very important to study existing environments. This makes research a very important aspect of programming phase of any project. Fact finding, and research help to collect already existing data and to generate new information regarding the project. The collected information is then analyzed and only that part is used which is pertaining to the project goals. Inclusive design is also a part of these goals.

2.4.2 Incorporating People in the Design Process

Inclusive design emphasizes a lot on understanding the needs of the potential users. It means to put all the people with personal stake in the design of final product into the design process. This is also known as "participatory design" (Nussbaumer, 2011).

Figure 1. Kettlesense

Source: http://news.bbc.co.uk/2/hi/uk_news/4079345.stm

For example, Clarkson et al. (2003) shares this example in their book titled “Inclusive design - Design for the whole population” re-enforcing the importance of user feedback in designing for enhanced inclusiveness.

For 2001 DBA Design Challenge: 'Innovation through inclusive design,' Kettlesense designed a domestic kettle. They took feedback on existing kettles from wide range of focus groups having diverse needs. Some of the main difficulties highlighted by focus group were safety, filling, switching, water levels, water quality and cable management. To cater these difficulties highlighted by focus groups, new design having two chambers was introduced as shown in Figure 1. The lower jug, which was light weight having no electrical components, combined with a boiling chamber as shown in Figure 1. After boiling, the user is informed by both audio and visual alerts. It can then be poured in a required vessel with the help of a fail-safe lever. Continuous experiments enabled them to finalize the size of pouring nozzle to avoid splashing, also incorporating a steam

duct that carries steam collected while pouring away to the rear end where cool air disperses it. Stepped level jug helped the user to see or feel the level of water poured.

Surveys, interviews, and focus groups are valuable ways to gather data about the user experiences for any inclusive design project. The above example shows the incorporation of focus group and experimentation to improve the inclusiveness through improved product design. Experimentation begins with pretest- then treatment followed by posttest. Observation is another important tool to understand the ways in which a space is used by the users. Behavioral observation gives information about the pros and cons of existing design. Therefore, incorporating people into a design process through all these methods mentioned above helps enhancing inclusiveness of that product (Nussbaumer, 2011).

2.5 Significance of Getting Feedback from the Users

Getting user feedback communicates the problems faced by the users and provide designers with the information needed to improve any design for inclusiveness. The example shared in 2.4 highlights this as well. User feedback has equal importance in the design of any built facility as accessibility can be a major aspect effecting the participation of a disabled person in any physical activity (Pike, Walker, Collins, & Hodges, 2008), which many therapists acknowledge to have an impact on his life satisfaction (Fänge, Iwarsson, & Persson, 2002). Since everyone has equal rights, accessibility should be considered to provide equal access to disabled, because when their rights are not fulfilled, people may feel oppressed leading to stress and vulnerability (Nosek, Foley, Hughes, & Howland, 2001; Iwasaki & Mactavish, 2005). Therefore, it is important to have feedback from disabled people to handle this problem efficiently and avoid social exclusion faced by them (Kadir & Jamaludin, 2012). Furthermore, an able-bodied person cannot fully apprehend the difficulties faced by a disabled person, therefore, it is important to know their perception of

accessibility before making any decisions. There are studies that also highlight the same issue and some of them are shared in Table 2.

Table 2. Selected studies regarding accessibility laws and perceived accessibility

Source	Methodology	Findings
Kadir & Jamaludin, 2012	Five public buildings complying with Malaysian codes (MS 1184:1991 Code of Practice on Access for Disabled People to Public Buildings, and MS 1331:1993 Code of Practice on Access for Disabled People Outside Buildings) were accessed for this study. The participants of the study were people suffering from physical disabilities. The instruments used for this study include access audit (which is a designed questionnaire) and interviews. There were questions about 15 design facilities of buildings.	Except one facility out of 5, the level of satisfaction in all four of the facilities was a little above average even after the buildings were following accessibility codes.
Simonson, Glick, & Nobe, 2013	165 Students suffering from physical impairments were asked about their satisfaction level regarding accessibility of their university. There were questions about some old buildings, and some new buildings following ADA.	For all the new buildings following ADA, the satisfaction level was found a little above average.
Sanchez, Byfield, Brown, LaFavor, Murphy, & Laud, 2000	40 healthcare clinics were asked questions in a telephonic interview about accessibility of their facilities. These were 7 questions: Does the site consider itself to be wheelchair accessible? Does the site have a wheelchair-accessible bathroom, an examination table that can be lowered to wheelchair level, and handicapped parking available? Has the staff ever treated anyone with a spinal cord injury?	97% respondents said that their parking is accessible, however only 87% was complying the codes. 38% replied that their examination table could be lowered to wheelchair level, only 17.5% had such table. 93% replied that their bathroom is accessible, however, only 60% were following the laws. (Similar findings for other questions)

Table 2. (cont'd)

	Has the staff had experience assisting with wheelchair transfers? Has the staff had experience in assisting with the management of autonomic dysreflexia?After their responses, the facilities were then visited to physically access them based on ADA guidelines.	This shows that administration do not have an in-depth knowledge or understanding about accessibility laws or the needs of people with disabilities.

The studies also indicate that building accessibility should not be measured based on building standard and codes, because codes majorly revolve around architectural aspects related to wheelchair users (Thapar, Warner, Drainoni, William, Ditchfield, Wierbicky, & Nesathurai, 2004). However, Accessibility is a problem that anyone can face, as anyone can be enabled or disabled by the built environment (Heylighen et al., 2017). This makes feedback from users' imperative for an inclusive design.

CHAPTER 3: METHODOLOGY

3.1 Research Process

Previous studies indicate that there is a gap between understanding of the needs of disabled people by designers or administration (Kadir & Jamaludin, 2012; Clarkson et al., 2003; Sanchez et al., 2000). There are several ways discussed in literature review that can improve final product in terms of inclusiveness. For present study, focus group is adopted to identify the needs of disabled people regarding building use.

State parks with their amenities are among the biggest public facilities that provide opportunities of social and physical participation to diverse user groups. Therefore, it is of prime importance to satisfy their needs as it has an impact on their level of participation. Furthermore, DNR in Michigan is also working to take state parks and their facilities in Michigan beyond the standards of ADA. This made state park buildings a very suitable choice for current study. The study is divided into two phases. Case studies were conducted in the phase 1 and perceived accessibility of users was measured with a focus group in the phase 2.

After preliminary literature review on state parks and inclusive design, a meeting was held with the Michigan Department of Natural Resources (DNR) to share this idea. They showed their interest in this idea and recommended representative state parks and buildings there in to be considered for this study. From the list that DNR shared, six buildings in three state parks were selected to conduct case studies in phase 1. These buildings are shown in Table 3.

Table 3. State park facilities selected for case studies

State Park	Buildings	Address
Ralph A. MacMullan Conference Center (RAM Center)	Conservation Education Building	104 Conservation Drive, Roscommon, MI 48635
	Lake Ontario Lodge	
	Resource Center	
Ludington State Park	Concessions Building	8800 W. M-116, Ludington, MI 49431
	Lake Michigan Beach House	
Holland State Park	Beach House	2215 Ottawa Beach Rd, Holland, MI 49424

After doing secondary literature review, a set of inclusive design guidelines were compiled using Nussbaumer (2011) and accessibility checklist provided by DNR as two primary sources. Nussbaumer (2011) in her book titled "Inclusive Design: A Universal Need" shared design questions derived from a checklist developed by Levine (2003). This checklist has guidelines that comply with ADA and also incorporate inclusive design in the project.

The checklist shared by DNR was the one that is used by them to assess state park buildings. The compiled guidelines from these two sources were used to develop inclusive design assessment tool for conducting case studies. This tool had 77 design features regarding the design of parking facility, exterior routes, interior routes, entrance and doorways, bathrooms, bedrooms, and signage/wayfinding of a built facility. The detailed formation of this tool is discussed in the next section. It was then used to conduct case studies in summer, 2017.

In phase 2 of this study, a focus group was used to measure perceived accessibility of state park buildings. Nine senior citizens were recruited from Lansing and East Lansing area to visit the facility in March 2018. The focus group was conducted in the most representative state park (i.e., Ralph A.MacMullan Conference Center). During the day of site visit with focus group, they were first briefed about the study and were asked to carefully read and sign the consent forms. After

getting their consent, focus group participants visited four buildings at RAM center as shown in Table 4 and filled out a survey having questions about their satisfaction level regarding accessibility of similar design features as assessed in case studies. They were also asked to give any recommendation for improvement of these facilities regarding inclusiveness.

The research process is shown in Figure 2.

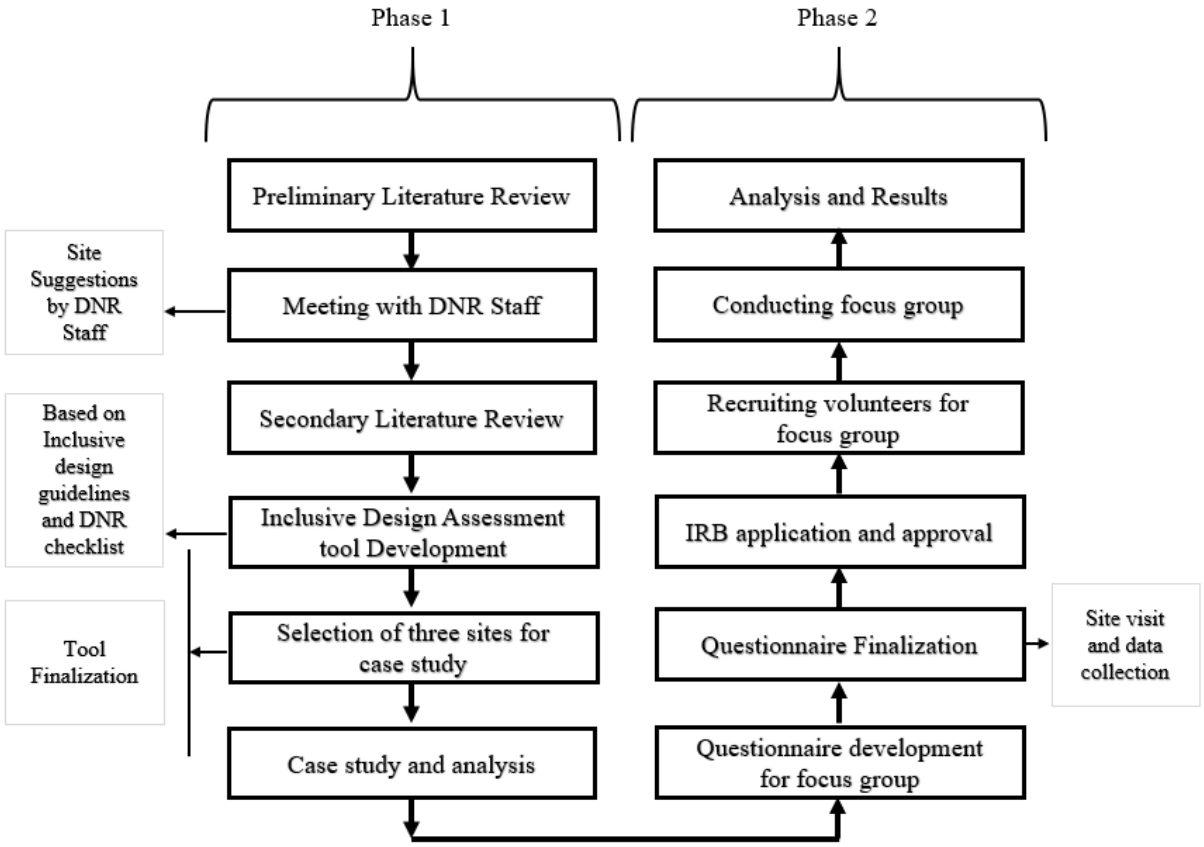


Figure 2. Research Process

3.2 Inclusive Design Assessment Tool for Case Studies

To develop an assessment tool, two primary sources were used. These sources include Nussbaumer (2011) and accessibility checklist provided by DNR in Michigan. Nussbaumer (2011) in her book titled "Inclusive Design: A Universal Need" shared design questions derived from a checklist developed by Levine (2003). This checklist has guidelines for built facilities that comply with ADA and also incorporate inclusive design.

The accessibility checklist provided by DNR also had both ADA guidelines and several guidelines from universal design. The design features that were in the DNR checklist include signage, parking, exterior route, interior route, entrance and doorway, transient lodging, lodges, drinking fountain, ramps, restrooms, dining and work surface, changing rooms, kitchen and kitchenettes, showers, boating access site skid piers, fishing piers and platforms, play areas, food service lines, check-out, service counter, passenger loading zone, elevator, stairs, laundary rooms, directional information signs, telephones, assembly areas, recreational boating facilities, shooting ranges, directional signs and variable message signs.

Because of the limited time frame to conduct this study, minute specifications or measurements were not made part of the assessment tool. Instead, questions format was kept in the tool that should be addressed by the designer while making design decisions for inclusiveness. The tool had seven sections asking questions about seven parts of built facility. These sections were about parking facility, exterior routes, entrance and doorways, interior routes, bathrooms, bedrooms, and signage/wayfinding.

Section 1 of the inclusive design assessment tool had questions regarding parking facility. The questions in this section are shown in Table 4. The questions in this section cover design of

parking lot with reference to the building, it's safety and loading/unloading arrangements provided for the users.

Table 4. Design aspects related to parking facility in the inclusive design assessment tool

Design feature	Questions	Scale
Parking Facility	1. Is there a priority parking close to the entrance for different users? 2. Is the parking lot safe and secure? (To increase safety and prevent speeding, speed bumps and slow signs are strategically designed in the parking lot) 3. Is the parking lot illuminated? 4. Are all pathways illuminated? 5. Are there optional pathways to access the entrance? 6. Are all pathways easily accessible? 7. Are all path ways free of obstacle? 8. Is the pathway easy to maneuver? 9. Is the passenger loading zone illuminated? 10. Is a protective covering provided over loading zone? 11. Are all paths of travel illuminated or easily located?	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: The questions developed on the basis of Nussbaumer (2011) on p.147.

The second section of the assessment tool was about the exterior routes connecting parking lot to the entrance of building. It majorly had questions regarding level, safety, color and material used for exterior routes. The questions asked in this section are shown in Table 5.

Table 5. Design aspects related to exterior routes in the inclusive design assessment tool

Design feature	Questions	Scale
Exterior routes	12. Are all walking surfaces stable and firm? 13. Are all walking surfaces smooth and leveled? 14. Do all hard or resilient floor coverings have non-slip finishes? 15. If floor changes coverings are needed, are they within a half inch? 16. Are colors easy on the eyes? 17. Are materials non-reflective?	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: The questions developed on the basis of Nussbaumer (2011) on p.149.

The third section of the tool was about entrance and doorway design of the building. The questions asked in this section were majorly about the ease of identifying entrance in the main façade, effort needed to open the entrance door, ease of maneuvering through the entrance door, and space provision in the lobby. Section 3 is shown in Table 6.

Table 6. Design aspects related to entrance and doorways in the inclusive design assessment tool

Design feature	Questions	Scale
Entrance and doorways	18. Is the entrance door on a sensor? 19. If not, is it easy to maneuver through the door with packages, strollers, small children, arthritic hands, canes, crutches, or wheelchairs? 20. Is the pathway clear at the entrance? 21. Is the entrance also an emergency egress? 22. Is the accessible entrance separate or same for everyone? 23. Does the door automatically sense that someone's arriving? 24. Is the door easy for everyone to open if the sensor is not used? (Handles, locks, and latches operable with one hand and without requiring tight pinching, tight grasping or twisting of the wrist) 25. Is there plenty of clear floor space in the entrance of lobby? 26. Is enough space allowed for groups of people to meet without blocking the entrance of affecting circulation? 27. Is the (emergency) escape route safe, easy to locate, and well-marked? 28. Is a place of refuge provided for emergency use? 29. Are all entry doorways automated or on grade? 30. Is there seating for people who must wait? 31. Is seating conveniently located to amenities, such as fountains telephones, waste receptacles and restrooms? 32. Are amenities adjustable or alternative heights?	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: The questions developed on the basis of Nussbaumer (2011) on p.148.

The fourth section of the inclusive design assessment tool was about the interior routes and surfaces of the building. It had questions regarding colors of interior surfaces, materials used in

interior surfaces, design of elevators and the width of hallways in a building. The detailed questions asked in this section are shown in Table 7.

Table 7. Design aspects related to interior routes and surfaces in the inclusive design assessment tool

Design feature	Questions	Scale
Interior routes and surfaces	33. Does an elevator or ramp connect every level? 34. Is the elevator lobby close to entrance or an important entrance function? 35. Are all buttons on the appropriate level and easy to locate? 36. If elevators are not appropriate, is there escalator, a moving pathway or a method of moving large number of people quickly? 37. Is there a voice activated announcement or color coding provided when there are changes in elevation, movement or a similar change? 38. Is there a plenty of clear floor space to make a 180 degree turn in the elevator lobby for a large group, wheelchairs, strollers or to pull luggage? 39. Are transitional spaces such as hallway or corridor illuminated? 40. Are transitional spaces devoid of obstacles? 41. Are transitional spaces are wide enough to accommodate a group of people? 42. Are all walking surfaces stable and firm? 43. Are all walking surfaces smooth and leveled? 44. Do all hard or resilient floor coverings have non-slip finishes? 45. If floor changes coverings are needed, are they within a half inch? 46. Are colors easy on the eyes? 47. Are materials non-reflective?	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: The questions developed on the basis of Nussbaumer (2011) on p.148.

The fifth section of the inclusive design assessment tool was about the bathrooms provided in public buildings. It also included shower areas provided in lodging facilities. The questions asked in this section were about the color, and texture of bathroom surfaces, amount of light provided in the bathroom and safety measures taken for the disabled users. The detail questions of this section are shown in Table 8.

Table 8. Design aspects related to bathrooms in the inclusive design assessment tool

Design feature	Questions	Scale
Bathrooms	48. If toilet rooms are available to the public, is at least one toilet room/stall accessible? 49. If not all toilet rooms are accessible, are there signs that give directions to accessible toilet rooms? 50. If not all toilet rooms are accessible, is there a sign at the accessible toilet room with the International Symbol of Accessibility? 51. Do the signs idenfitying the bathroom gender accessible? 52. If there is a privacy wall at the entrance of the restroom and the door swings out, is there adequate maneuvering space beyond the door of, at least 24" of maneuvering clearance beyond the latch side of the door and 42" between the privacy wall and doorway? 53. In a single user toilet room if the door swings in over the required clear floor space is there adequate space, of 30"x48", for a wheelchair beyond the swing of the door? 54. Door opening: Is there a 32" clear opening; pocket present? 55. Is there slip resistant tile on floor 56. Towel bars are located at varied heights 57. Grab bars are given in toilet 58. Mirrors are located at such height to facilitate seated people as well. 59. There are grab bars in shower areas 60. There is a walk-in shower rather than a tub	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: Accessibility checklist used by Michigan Department of Natural Resources for assessment of state park buildings in Michigan

The sixth section of inclusive design assessment tool used for case studies had questions regarding bedroom designs. In state park's lodging facilities, bedrooms are provided for people planning to stay night in the park. The questions raised in this section address the space allocation in the room and furniture layout. See Table 9 for a list of questions.

Table 9. Design aspects related to bedrooms in the inclusive design assessment tool

Design feature	Questions	Scale
Bedrooms	61. Are rooms easily accessible or adaptable for various needs? 62. Is at least one of each type of lodging accessible? 63. Does at least one sleeping area provide a 30"x48" area of clear space on both sides of the bed 64. Is there adequate turning space of 60" diameter circle or a T-shaped space within a 60" square within each room with accessible features of the cabin? 65. Are rooms fully accessible of adaptable for various needs	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each question of the tool.

Note: Accessibility checklist used by Michigan Department of Natural Resources for assessment of state park buildings in Michigan

The last section of the assessment tool was about signage and wayfinding information provided in any built facility. The questions asked in this section were about the provision of signage, the colors and textures used for signages, the mounted height of signs and wayfinding information, along with the emergency exit designs. The detailed questions asked in this section are shared in Table 10.

Table 10. Design aspects related to signage and wayfinding information in the inclusive design assessment tool

Design feature	Questions	Scale
Signage and wayfinding information	66. Is there good signage that indicates the entrance? 67. Is the welcome, information, registration desk, or other similar area easy to locate? 68. Is the space easy to circulate with appropriate signage, markers and other wayfinding devices? 69. Is the (emergency) escape route safe, easy to locate, and well-marked? 70. Are exit signs illuminated at the floor levels?	To record the findings for each building, simple yes and no were used to represent compliance or non-compliance with each

Table 10. (cont'd)

	71. Are there visual and audible signaling systems? 72. Is a directory and wayfinding information provided that includes visuals, tactile and audible forms? 73. If not at the entrance, is there directional signage to guide people to their destinations? 74. Does signage have tactile characters, well pronounced and easy to read fonts, good contrasts and braille? 75. Is signage mounted at the required heights? 76. Is the room numbered system logical so that it is easy to find rooms? 77. Is there an audio signage for key destinations?	question of the tool.

Note: The questions developed on the basis of Nussbaumer (2011) on p.148s.

Out of the seventy-seven design aspects included in the inclusive design assessment tool, all the aspects were not applicable on each building assessed for case study. For example, bedrooms were only present in the lodges and concessions had no bathroom facility. While conducting case studies, these aspects were marked as non-applicable (N/A) on the accessibility tool.

3.3 Focus Group

Several research methods and devices are used in an inclusive design project to improve their inclusiveness, as discussed in chapter 2. For this research, a focus group is utilized. Clarkson et al. (2003) while discussing use of focus groups for inclusive design research says, "A focus group provides the opportunity for in-depth discussion and exploration of the issues." (p. 206). It is also recommended to keep a qualitative focus group small (Clarkson et al., 2003).

For this research, a focus group of nine senior citizens with age 70 years and more was used. Multiple impairments are more common in older people (Clarkson et al., 2003). They suffer from multiple issues at the same time as compared to younger disabled counterparts. Therefore, they can provide more knowledge and information about disability issues, improving the design

holistically for all. As Clarkson et al. (2003) mentioned “design for older and disabled people and you could be designing for everybody” (p. 572).

3.3.1 Data Collection Through Focus Group

Data collection in a focus group is a delicate process, but there are several things that needs to be considered during the process (Sim, 1998). In addition to what participants say, it should also be recorded on how they interact with each other. Responses from each member should be attributed properly to that person. There should be no interference or disturbance caused by data collection towards group coordination. There should be no reactive effect of data collection tool used on the group participants. In addition to these factors related to data collection, a moderator or researcher also plays a pivotal role. He has both active and passive roles to play. Generating interest about a topic which is related to his research interest and start discussion among participants, without imposing any expected findings or previous hypothesis (Sim, 1998). These guidelines were considered carefully during site visit with focus group and data collection.

3.3.2 Previous Studies Regarding Perceived Accessibility

To conduct a focus group, a detailed questionnaire was developed for four facilities at RAM Center. The questionnaire aimed to measure the satisfaction level of the visitors regarding different parts of buildings. These are same design features covered in the inclusive design assessment tool. In order to develop this questionnaire, several previous studies on perceived accessibility were reviewed along with the surveys used for those studies. Table 11 summarizes the different types of questions raised in previous studies regarding perceived accessibility.

Table 11. Sources for questionnaire development for focus group

Facility	Questions	Scale	Reference
Parking Facility	Accessible parking on campus is adequate for my needs.	5-point Likert scale for agreement *	Simonson, 2012
	Users were asked about their level of satisfaction regarding disabled parking space.	5-point Likert scale for satisfaction **	Kadir, & Jamaludin, 2012
Exterior routes	Sidewalks on campus are adequate for my needs.	5-point Likert scale for agreement *	Simonson, 2012
	Users were asked about their level of satisfaction regarding pedestrian pathways.	5-point Likert scale for satisfaction **	Kadir, & Jamaludin, 2012
	Users were asked about their level of satisfaction regarding ramps.		
Signage	Campus signs are easy to read and understand.	5-point Likert scale for agreement *	Simonson, 2012
	It easy to find my way in corridors and hallways of buildings.		
	Users were asked about their level of satisfaction regarding signage.	5-point Likert scale for satisfaction **	Kadir, & Jamaludin, 2012
Entrance and doorways	Accessible building entrances are easy to identify.	5-point Likert scale for agreement *	Simonson, 2012
	Accessible building entrances are adequate for my needs.		
	Interior doors in buildings are adequate for my needs and accessible.		
	Users were asked about their level of satisfaction regarding main Entrance.	5-point Likert scale for satisfaction **	Kadir, & Jamaludin, 2012
	Users were asked about their level of satisfaction regarding door and doorways.		
Interior routes	Users were asked about their level of satisfaction regarding interior pathways.	5-point Likert scale for satisfaction **	Kadir, & Jamaludin, 2012
	Users were asked about their level of satisfaction regarding information counter.		
	Users were asked about their level of satisfaction regarding stairways.		
	Users were asked about their level of satisfaction regarding elevators.		
	Users were asked about their level of satisfaction regarding escalators.		

Note: * 5-point Likert scale, 1 for “strongly agreeing”, 2 for “agree”, 3 for “neither agree nor disagree”, 4 for “disagree”, and 5 for “strongly disagree”.
** evaluate the participants’ level of satisfaction, 1 for “not at all satisfied”, 2 for “slightly unsatisfied”, 3 for “somewhat satisfied”, 4 for “satisfied” and 5 for “extremely satisfied”

Based on these examples, a survey measuring the satisfaction level of visitors was developed. The order of the questions in survey were considered as suggested by Dillman, Smyth, and Christian (2009). The questions followed the order in which the facility is physically used by the users. Moreover, the demographic information, which is considered relatively sensitive was asked at the end of the survey (Dillman, Smyth, & Christian, 2009).

3.3.3 Questionnaire for Focus Group

Questionnaire for the focus group had similar sections as were in the inclusive design assessment tool used for case studies. Since three types of buildings were visited by focus group participants, the questions were a little different for each building type. Also, the design of RAM Center was also considered while designing of questionnaire. The questionnaire had four types of questions. Some satisfaction questions, some agreement questions, some need based questions and last part of each section was for focus group participants to give any recommendations.

First section of each questionnaire used for the buildings had questions regarding parking facility related to the particular building being visited. Table 12 shows the different kinds of questions asked in this section.

Table 12. Section 1 of questionnaire measuring user perception about accessibility of parking facility

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The directional signage provided at the parking lot.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The material used for parking lot.	
	The location of accessible parking spots in parking lot.	
	The drop off area provided with the building	
Participant's level of agreement with the following	I can easily locate entrance of resource center from parking lot.	From "strongly disagree" to "strongly agree" 1= Strongly Disagree 2= Slightly Disagree 3= Neutral 4= Slightly Agree 5= Strongly Agree
Participant's comments	What is your overall perception about the accessibility of parking lot t? Would you like to make some recommendations or comments to improve accessibility in parking lot?	Open ended question

The second section of the questionnaire used for focus group was about the exterior route that was used from parking lot towards the entrance of the building. Since RAM Center has common parking facility, this section was a little different for each questionnaire used for the buildings. the questions asked in this section are shown in Table 13.

Table 13. Section 2 of questionnaire measuring user perception about accessibility of exterior routes

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The route you took from parking lot to reach the entrance of the building.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The level of the exterior pathway provided at the entrance of the building.	
	The width of the exterior pathway provided at the entrance of the building.	
How much need do you feel of the following?	Designated pathway from parking lot to the entrance of resource center	From "Not at all" to "Very much" 1=Not at all 2= 3=Neutral 4= 5=Very much
	A public seating area on the exterior route from parking to the entrance of resource center.	
Participant's comments	What is your overall perception about the accessibility of exterior route? Would you like to make some recommendations or comments to improve its accessibility?	Open ended question

The third section of the questionnaire asked questions regarding perception of focus group members about entrance and doorway of the building. The questions included in this section are shared in Table 14.

Table 14. Section 3 of questionnaire measuring user perception about accessibility of entrances and doorways

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The width of the entrance door.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The change in floor finishes at the entrance of the building.	
	The distance between parking and the entrance of the building.	
	Counter height at the reception.	
	The space provided in front of reception.	
	The accessibility of seating area provided with the reception	
Participant's level of agreement with the following	I can easily identify main entrance in the main façade of the building.	From "strongly disagree" to "strongly agree" 1= Strongly Disagree 2= Slightly Disagree 3= Neutral 4= Slightly Agree 5= Strongly Agree
	I can easily open the entrance door.	
Participant's comments	What is your overall perception about the accessibility of the entrance of this building? Would you like to make some recommendations or comments to improve its accessibility?	Open ended question

The fourth section of the questionnaire had questions regarding the user perception about signage and wayfinding information provided in the facility. The questions in this section were about the signage information provided inside the building. The specific questions asked in this section are shown in Table 15.

Table 15. Section 4 of questionnaire measuring user perception about signage and wayfinding information

Design feature	Questions	Scale
Participant's level of satisfaction with the following	Navigating the building with the help of signage or other wayfinding information	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The color used for signage.	
	The writing font used for signage.	
	The height of mounted signage information.	
Participant's level of agreement with the following	I can easily locate signage or any other wayfinding information at the entrance of the resource center building.	From "strongly disagree" to "strongly agree" 1= Strongly Disagree 2= Slightly Disagree 3= Neutral 4= Slightly Agree 5= Strongly Agree
	I can easily locate exit signs in the building.	
	I can easily locate emergency exits in the building	
Participant's comments	What is your overall perception about the signage or other wayfinding information provided in the building? Would you like to make any recommendations or comments?	Open ended question

The fifth section of the questionnaire had questions regarding interior routes and surfaces of the buildings. To answer these questions, focus group participants were asked to consider all the vertical and horizontal surfaces. The detailed questions asked in this section are shared in Table 16.

Table 16. Section 5 of questionnaire measuring user perception about interior route and surfaces of the building

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The amount of light in the building.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The flooring material inside the building.	
	he colors of the all interior materials used in the building	
	The width of hallway in the building	
Participant's comments	What is your overall perception about interior of the building? Would you like to make any recommendations or comments?	Open ended question

The sixth section of the questionnaire was about the bathroom design. The detail questions asked in this section are shared in Table 17.

Table 17. Section 6 of questionnaire measuring user perception about bathroom accessibility

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The location of bathrooms in Resource Center.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The width of the entrance door of the bathroom.	
	The layout of the bathroom.	
	The width of the bathroom (space provided inside the bathroom)	
	Accessibility of bathroom stalls	
	The height of wash basin in bathroom.	
	The width of wash basin in bathroom.	
	The height of mirror in bathroom.	
	The texture of flooring material used in the bathroom.	
	The colors of all interior materials used in the bathroom	
Participant's comments	What is your overall perception about accessibility of bathrooms in the building? Would you like to make any recommendations or comments?	Open ended question

The seventh section of the questionnaire was about the accessibility of bedrooms. This section was only included in the questionnaire used by focus group while visiting lodges. The questions included in this section are shown in Table 18.

Table 18. Section 7 of questionnaire measuring user perception about bedroom designs

Design feature	Questions	Scale
Participant's level of satisfaction with the following	The width of the entrance door of the room.	From "very unsatisfied" to "very satisfied" 1= Very Unsatisfied 2= Slightly Unsatisfied 3= Neutral 4= Slightly Satisfied 5= Very Satisfied
	The height of the entrance door of the room.	
	Width of the room.	
	Height of the bed in the room.	
	The furniture provided in the room.	
	Window height in the room.	
	The colors of the materials used in the room.	
Participant's comments	What is your overall perception about accessibility of the rooms in the lodge? Would you like to make any recommendations or comments?	Open ended question

The last component of the questionnaire was related to the demographic information of the focus group participant. The questions included in this section are shared in Table 19.

Table 19. Demographic information asked from focus group participants

Question	Options			
Your age (in years)	50 or less	51-55	56-60	61-65
	66-70	71-75	76-80	80 or above
Your gender	Male	Female	Decline	
Your ethnic or cultural group you consider yourself a member of? Please check all that apply.	Anglo/White	African American/ Black	Hispanic/ Chicano/ Latino	American Indian/ Native American
	Asian/ Oriental/ Pacific Islander	Multiracial	Prefer not to answer	Other (please specify)

After developing the questionnaire, and reviewing it for any improvements, it was submitted to university's review board to get an IRB approval. The final questionnaire was submitted on 2nd December 2017 and after making some improvements as per the comments of review board, it got approved on January 3rd, 2018.

3.3.4 Recruiting Participants for the Focus Group

In order to get the word out about this and start the process of recruiting focus group participants, a senior center in Lansing area was visited. Several groups taking different sessions at senior citizens were briefed about the study and posters having information regarding study were also left behind for them. A small volunteer organization working at Michigan State University known as CVIP (Community Volunteer International Program) was also approached as it had many senior citizen members. After waiting for few days and getting very little positive feedback, personal contacts were also used to recruit volunteers for this study.

Nine senior citizens were recruited for this study and majority of them were those who were approached through personal contacts. There were no participants from the senior center, however, three volunteers were members of CVIP. One of the reason for receiving less participation from the senior center was mostly due to extreme weather conditions. This study was conducted during the winter, a season known for Michigan to be extreme due to blizzards and heavy snowfalls.

CHAPTER 4: RESULTS

4.1 Case Studies

Six buildings in three state parks were selected for case studies. The buildings, and state parks are shown in Table 20 along with the location map of each state park.

Table 20. List of State Parks with the buildings visited for case study

State Park	Built Facility	Address
Ralph A. MacMullan Conference Center (RAM Center)	Conservation Education Building	104 Conservation Drive, Roscommon, MI 48635
	Lake Ontario Lodge	
	Resource Center	
Ludington State Park	Concessions Building	8800 W. M-116, Ludington, MI 49431
	Lake Michigan Beach House	
Holland State Park	Beach House	2215 Ottawa Beach Rd, Holland, MI 49424

These parks were visited in July 2017 and were assessed using inclusive design assessment tool shared in Appendix A. The findings of case studies are shared below.

4.1.1 Parking Facility

People in the US use cars as major mode of transportation, especially when they are suffering from any physical disability. Therefore, adequate parking facility should be provided for car users to facilitate them. Several design aspects for parking facility design were assessed using the assessment tool. When state parks were visited for case studies, two out of three state parks

didn't even have lights in the parking lot and none of the six buildings visited had the covered loading/unloading zone for visitors. However, all state park facilities had priority parking for disabled and elderly visitors. Detailed findings regarding parking facilities are shared in Table 21 with images after that.

Table 21. Parking Facility in State Parks

			Ralph A. MacMullan Conference Center			**Ludington State Park**		**Holland State Park**
			Conserv-ation Education Building	**Lake Ontario Lodge**	**Reso-urce Center**	**Concessions**	**Lake Michigan Beach House**	**Beach House**
Parking Facility	1	Is there a priority parking close to the entrance for different users?	Yes	No	Yes	Yes	Yes	Yes
	2	Is the parking lot safe and secure? (To increase safety and prevent speeding, speed bumps and slow signs are strategically designed in the parking lot)	Yes	Yes	Yes	No	No	No
	3	Is the parking lot illuminated?	Yes	Yes	Yes	No	No	No
	4	Are all pathways illuminated?	Yes	Yes	Yes	No	No	No
	5	Are there optional pathways to access the entrance?	Yes	Yes	Yes	Yes	No	Yes
	6	Are all pathways easily accessible?	Yes	Yes	Yes	No	Yes	Yes
	7	Are all path ways free of obstacle?	Yes	Yes	Yes	No	Yes	Yes
	8	Is the pathway easy to maneuver?	Yes	Yes	Yes	Yes	Yes	Yes
	9	Is the passenger loading zone illuminated?	Yes	No	No	No	No	No
	10	Is a protective covering provided over loading zone?	Yes	No	No	No	No	No

Table 21. (cont'd)

	11	Are all paths of travel illuminated or easily located?	Yes	Yes	Yes	No	Yes	Yes

Figure 3. Entrance of Education building overlooking parking lot, RAM Center
(Photo credits: Author)

Figure 4. Parking outside concessions, Ludington State Park
(Photo credits: Author)

Figure 5. Parking Lot in front of Beach house, Holland State Park
(Photo credits: Author)

Figure 6. Entrance of Education building overlooking main Parking Lot, RAM Center
(Photo credits: Author)

Figure 7. Level change in parking lot in front of Concessions building, Ludington State Park
Photo credits: Author)

Figure 8. Parking in front of Lake Michigan Beach house, Ludington State Park
(Photo credits: Author)

4.1.2 Exterior Routes

From parking facility to the entrance of the building, the design of exterior route plays a very important role in making the walk easy or difficult for the user. Routes should be leveled, clearly visible and have least level changes. Several design guidelines were assessed in six

buildings regarding exterior routes and all had smooth, leveled, and stable surfaces for exterior routes. The findings are shared in Table 22.

Table 22. Exterior routes leading to buildings in State parks

			Ralph A. MacMullan Conference Center			Ludington State Park		Holland State Park
			Conserv-ation Education Building	Lake Ontario Lodge	Resource Center	Concessions	Lake Michigan Beach House	Beach House
Exterior Routes	12	Are all walking surfaces stable and firm?	Yes	Yes	Yes	Yes	Yes	Yes
	13	Are all walking surfaces smooth and leveled?	Yes	No	Yes	Yes	Yes	Yes
	14	Do all hard or resilient floor coverings have non-slip finishes?	Yes	Yes	Yes	Yes	Yes	Yes
	15	If floor changes coverings are needed, are they within a half inch?	Yes	No	Yes	Yes	Yes	Yes
	16	Are colors easy on the eyes?	Yes	Yes	Yes	Yes	Yes	Yes
	17	Are materials non-reflective?	Yes	Yes	Yes	Yes	Yes	Yes

Figure 9. Exterior route leading towards Lake Ontario Lodge, RAM Center (Photo credits: Author)

Figure 10. Route from parking to the entrance of Lake Michigan Beach House, Ludington State Park

Figure 11. Route from parking to beach house Holland State Park (Photo credits: Author)

Figure 12. Exterior route from parking to Conservation Education Building, RAM Center
(Photo credits: Author)

Figure 13. Exterior route from main parking lot to concessions, Ludington State Park
Photo credits: Author)

Figure 14. Exterior route from parking to beach Holland State Park
(Photo credits: Author)

Figure 15. Exterior route from Resource center to Lake Ontario Lodge, RAM Center
(Photo credits: Author)

4.1.3 Entrance and Doorways

Entrance in public building should be easily accessible for every user. In present study, almost every building selected for case studies had different function and had varied user groups. None of the facility had entrance door on sensor, except one building which had a push button. Amenities in the rest of the buildings were not adjustable as per diverse user group for example, counter height, table height and width etc. Entrances were serving as emergency exit in all the

buildings and were easy to locate with exit signs provided in most of them. The findings of case studies are shown in Table 23 along with the images after that.

Table 23. Entrance and doorways in state park buildings

			Ralph A. MacMullan Conference Center			**Ludington State Park**		**Holland State Park**
			Conserv-ation Education Building	**Lake Ontario Lodge**	**Resource Center**	**Conce-ssions**	**Lake Michigan Beach House**	**Beach House**
Entrance and doorway	18	Is the entrance door on a sensor?	No	No	No	No	No	No
	19	If not, is it easy to maneuver through the door with packages, strollers, small children, arthritic hands, canes, crutches, or wheelchairs?	Yes	No	Yes	No	No	Yes
	20	Is the pathway clear at the entrance?	Yes	Yes	Yes	Yes	Yes	Yes
	21	Is the entrance also an emergency egress?	Yes	Yes	Yes	Yes	Yes	Yes
	22	Is the accessible entrance separate or same for everyone?	Yes	Yes	Yes	Yes	Yes	Yes
	23	Does the door automatically sense that someone's arriving?	No	No	No	No	No	No
	24	Is the door easy for everyone to open if the sensor is not used? (Handles, locks, and latches operable with one hand and without requiring tight pinching, tight grasping or twisting of the wrist)	Yes	No	Yes	No	No	Yes

Table 23. (cont'd)

	25	Is there plenty of clear floor space in the entrance of lobby?	Yes	No	Yes	No	Yes	Yes
	26	Is enough space allowed for groups of people to meet without blocking the entrance of affecting circulation?	Yes	No	Yes	No	Yes	Yes
	27	Is the (emergency) escape route safe, easy to locate, and well marked?	Yes	Yes	Yes	Yes	Yes	Yes
	28	Is a place of refuge provided for emergency use?	No	No	No	No	No	No
	29	Are all entry doorways automated or on grade?	No	No	No	No	No	No
	30	Is there seating for people who must wait?	Yes	Yes	Yes	Yes	Yes	Yes
	31	Is seating conveniently located to amenities, such as fountains, telephones, waste receptacles and restrooms?	Yes	Yes	Yes	No	No	Yes
	32	Are amenities adjustable or alternative heights?	No	No	Yes	No	No	No

Figure 16. Entrance lobby of Conservation Education building, RAM Center (Photo credits: Author)

Figure 17. Entrance of Concessions building, Ludington State Park Photo credits: Author)

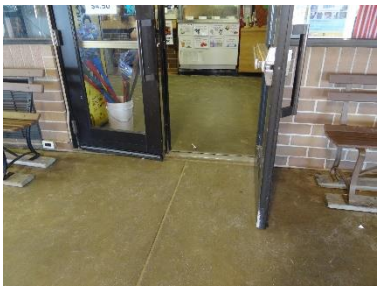


Figure 18. Entrance of shop in Beach house, Holland State Park (Photo credits: Author)

Figure 19. Lobby in Resource Center, RAM Center (Photo credits: Author)

Figure 20. Steps inside the entrance of Lake Michigan Beach House, Ludington State Park Photo credits: Author)

4.1.4 Interior Routes and Surfaces

To use a built facility conveniently, the accessibility of interior routes is also very important. All the six state park buildings visited for the case study had non-slip and firm surface. Majority of these buildings were single story, so they had no elevator. Conservation education building in Ralph A McMullan Conference Center was relatively new construction and was complying with ADA guidelines. The elevators in this building followed the guidelines mentioned in the assessment tool. The transitional spaces in all six buildings were illuminated, so it was easy

for the visitors to maneuver through. The detail findings regarding interior routes and surfaces are presented in Table 24.

Table 24. Interior routes in state park buildings

			Ralph A. MacMullan Conference Center			Ludington State Park		Holland State Park
			Conserv-ation Education Building	Lake Ontario Lodge	Resource Center	Concessions	Lake Michigan Beach House	Beach House
Interior Routes	33	Does an elevator or ramp connect every level?	Yes	No	N/A	N/A	Yes	N/A
	34	Is the elevator lobby close to entrance or an important entrance function?	Yes	N/A	N/A	N/A	Yes	N/A
	35	Are all buttons on the appropriate level and easy to locate?	Yes	N/A	N/A	N/A	N/A	N/A
	36	If elevators are not appropriate, is there escalator, a moving pathway or a method of moving large number of people quickly?	No	N/A	N/A	N/A	No	N/A
	37	Is there a voice activated announcement or color coding provided when there are changes in elevation, movement or a similar change?	Yes	N/A	N/A	N/A	N/A	N/A
	38	Is there a plenty of clear floor space to make a 180 degree turn in the elevator lobby for a large group, wheelchairs, strollers or to pull luggage?	Yes	N/A	N/A	N/A	Yes	N/A
	39	Are transitional spaces such as hallway or corridor illuminated?	Yes	Yes	Yes	Yes	Yes	Yes

Table 24. (cont'd)

	40	Are transitional spaces devoid of obstacles?	Yes	Yes	Yes	Yes	Yes	Yes
	41	Are transitional spaces are wide enough to accommodate a group of people?	Yes	No	Yes	No	Yes	Yes
	42	Are all walking surfaces stable and firm?	Yes	Yes	Yes	Yes	Yes	Yes
	43	Are all walking surfaces smooth and leveled?	Yes	No	Yes	Yes	No	Yes
	44	Do all hard or resilient floor coverings have non-slip finishes?	Yes	Yes	Yes	Yes	Yes	Yes
	45	If floor changes coverings are needed, are they within a half inch?	Yes	Yes	Yes	Yes	Yes	Yes
	46	Are colors easy on the eyes?	Yes	Yes	Yes	Yes	Yes	Yes
	47	Are materials non-reflective?	Yes	Yes	Yes	Yes	Yes	Yes

Figure 21. Hallway inside Lake Ontario Lodge, RAM Center
(Photo credits: Author)

Figure 22. Steps inside Lake Michigan Beach House, Ludington State Park
Photo credits: Author)

Figure 23. Level difference inside Beach House, Holland State Park
(Photo credits: Author)

Figure 24. Hallway inside Conservation Education Building, RAM Center
(Photo credits: Author)

4.1.5 Bathrooms

It is very important for public facilities to have appropriate bathroom spaces for users. At RAM Center and Holland state park, there were bathrooms with each building visited, but in Ludington state park, there were no bathrooms in the concessions building. In most of these facilities, bathrooms were not complying with the assessment tool. This indicated a problem for people with varied physical abilities while using bathrooms. The detail measurements are shown in Table 25.

Table 25. Bathrooms in state park facilities

			Ralph A. MacMullan Conference Center			**Ludington State Park**		**Holland State Park**
			Conserv-ation Education Building	**Lake Ontario Lodge**	**Resource Center**	**Conces-sions**	**Lake Michi-gan Beach House**	**Beach House**
Bathrooms	48	If toilet rooms are available to the public, is at least one toilet room/stall accessible?	Yes	No	Yes	N/A	Yes	Yes

Table 25. (cont'd)

	49	If not all toilet rooms are accessible, are there signs that give directions to accessible toilet rooms?	N/A	No	N/A	N/A	Yes	Yes
	50	If not all toilet rooms are accessible, is there a sign at the accessible toilet room with the International Symbol of Accessibility?	Yes	No	N/A	N/A	Yes	Yes
	51	Do the signs idenfitying the bathroom gender accessible?	Yes	Yes	Yes	N/A	Yes	Yes
	52	If there is a privacy wall at the entrance of the restroom and the door swings out, is there adequate maneuvering space beyond the door of, at least 24" of maneuvering clearance beyond the latch side of the door and 42" between the privacy wall and doorway?	Yes	N/A	N/A	N/A	Yes	Yes
	53	In a single user toilet room if the door swings in over the required clear floor space is there adequate space, of 30"x48", for a wheelchair beyond the swing of the door?	Yes	No	No	N/A	Yes	Yes
	54	Door opening: Is there a 32" clear opening; pocket present?	Yes	Yes	Yes	N/A	Yes	Yes
	55	Is there slip resistant tile on floor	No	No	No	N/A	No	No
	56	Towel bars are located at varied heights	No	No	No	N/A	No	No
	57	Grab bars are given in toilet	Yes	No	No	N/A	Yes	Yes

Table 25. (cont'd)

	58	Mirrors are located at such height to facilitate seated people as well.	Yes	No	No	N/A	Yes	Yes
	59	There are grab bars in shower areas	N/A	No	N/A	N/A	N/A	N/A
	60	There is a walk-in shower rather than a tub	N/A	No	N/A	N/A	N/A	N/A

Figure 25. Bathroom in Lake Ontario Lodge, RAM Center (Photo credits: Author)

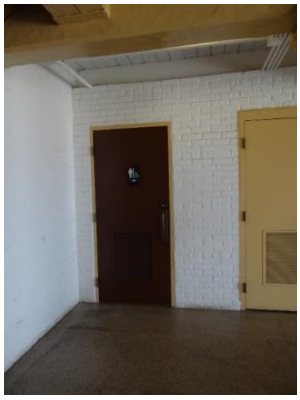


Figure 26. Sign on door of Bathroom inside Lake Michigan Beach House, Ludington State Park Photo credits: Author)

Figure 27. Bathroom inside Beach House, Holland State Park (Photo credits: Author)

Figure 28. Bathroom in Conservation Education Building, RAM Center (Photo credits: Author)

Figure 29. Bathroom door with accessibility sign in Resource Center, RAM Center (Photo credits: Author)

Figure 30. Sink in bathroom at beach house, Holland State Park (Photo credits: Author)

4.1.6 Bedrooms

Bedrooms were only assessed for Lake Ontario lodge in Ralph A McMullan Conference Center because rest of the facilities had no bed rooms. Since, Lake Ontario Lodge was an old construction, not complying with ADA guidelines, the rooms were very small in size and had many accessibility issues. There was not enough space for a wheelchair user.

Table 26. Bedrooms in Lake Ontario Lodge

			Ralph A. MacMullan Conference Center
			Lake Ontario Lodge
Bedrooms	61	Are rooms easily accessible or adaptable for various needs?	No
	62	Is at least one of each type of lodging accessible?	No
	63	Does at least one sleeping area provide a 30"x48" area of clear space on both sides of the bed	No
	64	Is there adequate turning space of 60" diameter circle or a T-shaped space within a 60" square within each room with accessible features of the cabin?	No
	65	Are rooms fully accessible of adaptable for various needs	No

4.1.7 Signage and Wayfinding

Inclusive design aims at facilitating the users of the built environment. The space should be made convenient for the users with the help of useful information. Signage is a mode that provides information to the users of the building so that they feel comfortable in navigation. In these case studies, total twelve signage design aspects were considered for each building. Out of these, no facility had visual or audible signage systems to facilitate the visitors suffering from audio or visual impairments. Since most of these buildings were not updated according to ADA guidelines, they were short of most of the signage design guidelines of the assessment tool. However, even the Conservation Education building, that was recently updated to meet ADA guidelines, it was also short of some signage design aspects including the directional signage at

the entrance which was mounted very high for wheelchair users or children. The details of signage arrangements are shared in Table 32 along with the pictures in Table 27.

Table 27. Signage and wayfinding arrangements for state park facilities

			Ralph A. MacMullan Conference Center			**Ludington State Park**		**Holland State Park**
			Conserv-ation Education Building	**Lake Ontario Lodge**	**Resource Center**	**Concess-ions**	**Lake Michigan Beach House**	**Beach House**
Signage	66	Is there good signage that indicates the entrance?	Yes	Yes	Yes	No	No	Yes
	67	Is the welcome, information, registration desk, or other similar area easy to locate?	Yes	N/A	Yes	Yes	No	N/A
	68	Is the space easy to circulate with appropriate signage, markers and other wayfinding devices?	Yes	Yes	Yes	Yes	No	No
	69	Is the (emergency) escape route safe, easy to locate, and well-marked?	Yes	Yes	Yes	N/A	Yes	Yes
	70	Are exit signs illuminated at the floor levels?	Yes	Yes	Yes	No	No	No
	71	Are there visual and audible signaling systems?	No	No	No	No	No	No
	72	Is a directory and wayfinding information provided that includes visuals, tactile and audible forms?	No	No	No	No	No	No

Table 27. (con'd)

	73	If not at the entrance, is there directional signage to guide people to their destinations?	Yes	No	No	No	No	No
	74	Does signage have tactile characters, well pronounced and easy to read fonts, good contrasts and braille?	No	No	No	N/A	N/A	No
	75	Is signage mounted at the required heights?	No	Yes	No	N/A	N/A	N/A
	76	Is the room numbered system logical so that it is easy to find rooms?	Yes	Yes	No	N/A	N/A	N/A
	77	Is there an audio signage for key destinations?	No	No	No	N/A	No	No

Figure 31. Exit sign in Conservation Education Building, RAM Center (Photo credits: Author)

Figure 32. Mounted wayfinding information in Conservation Education Building, RAM Center (Photo credits: Author)

Figure 33. signage for accessible parking spots, Ludington State Park Photo credits: Author)

Figure 34. Signage directing towards Beach house, Holland State Park (Photo credits: Author)

Figure 35. Signage at the entrance of Lake Ontario Lodge, RAM Center
(Photo credits: Author)

Figure 36. Mounted signage in Resource Center, RAM Center
(Photo credits: Author)

Figure 37. Signage inside Lake Michigan Beach House, Ludington State Park
(Photo credits: Author)

Figure 38. Signage outside Resource Center, RAM Center
(Photo credits: Author)

4.1.8 Percentage Compliance of State Park Buildings with Inclusive Design Assessment Tool

Total 77 design aspects were compiled in the assessment tool. Out of those 77, some of the design aspects were not applicable on some buildings because of the design and use of that facility. In Table 28, results of the case studies are shown in the form of total aspects followed, not followed, not applicable and finally percentage compliance of each building with the inclusive design assessment tool.

Table 28. Compliance of case studies with inclusive design assessment tool

State Parks	Buildings	Results of Case Studies			
		Total design aspects followed	**Total design aspects not followed**	**Total design aspects not applicable**	**Percentage Compliance with the tool** $\left(\frac{\text{Total design aspect followed}}{77\text{-Total design aspects not applicable}} \times 100\right)$
RAM Center	Conservation Education Building	56	13	8	81.10%
	Lake Ontario Lodge	32	36	9	47.05%
	Resource Center	43	16	18	72.88%
Ludington State Park	Concessions	24	24	29	50%
	Lake Michigan Beach House	39	26	12	60%
Holland State Park	Beach House	42	19	16	67.70%

Note: To measure percentage compliance with the tool, aspects not applicable were first subtracted from total design aspects assessed, which were 77. Then, total design aspect followed by a building were divided by this number to get the percentage compliance of that building with the tool

The tool used for the assessment of these buildings was composed of very basic questions and did not go into details of taking measurements, yet, none of the building was complying 100% with it. The findings indicated that all the buildings lack some of the basic accessibility design aspects that, if incorporated, would facilitate diverse users who visit these facilities. Ludington State park has the lowest accessibility according to the assessment tool used in this study. However, an important point noticed in this assessment was, since conservation education building was relatively a new construction, complying with ADA guidelines, it still had room for improvement as per the assessment tool. This supports the argument given by Clarkson et al.

(2003) that the ADA has minimum requirements and proves that there is room for improvement in ADA guidelines as well.

The design aspects assessed in this study were very basic, but their implementation in the built facility will not only support the disabled people but will enhance the quality of the facility for able bodied people as well.

4.2 Focus Group

Focus group is a technique used for in-depth participant interviews, not necessarily representing a specific population, but are selected based on the study's purpose (Thomas, MacMillan, McColl, Hale, & Bond, 1995). It is recommended that they have similar age ranges and socio-economic characteristics so that they will feel comfortable while interacting with each other and with the researcher. This would also benefit towards their participation in the interviews (Richardson & Rabiee, 2001).

4.2.1 Demographics of focus group

For the present study, focus group participants were recruited from Lansing and East Lansing areas of Michigan. The process of recruitment began in the end of February by visiting a senior center in the Lansing area. A couple of classes were going on at senior center and five-minute brief regarding this research was given in each class. Flyers were also left behind for the visitors of senior center. Another organization currently working at MSU, CVIP (Community Volunteers International Program) having many senior citizens as its members was also approached to spread the work out. After waiting for few weeks and getting very less positive feedback, personal contacts were also used to approach some senior citizens. By the end of first week of March, nine volunteers were recruited for the focus group.

The gender and age distribution of the members of focus group are shared in the Table 29 and Table 30 respectively. There were five male and four female participants. The age of all the participants was 70 years or more.

Table 29. Gender and Age distribution of focus group

Gender		
Male	**Female**	**Total**
5	4	9

Table 30. Age distribution of focus group

Age				
In years	**71-75**	**76-80**	**81 or above**	**Total**
Male	1	3	1	5
Female	3		1	4
Total	4	3	2	9

Most of the participants of focus group were not hundred percent able bodied and had some form of disability. Table 31 shows the disabilities that the focus group participants reported to the researcher. Three of the members did not have any disability, while other members had disabilities related to hearing, vision, arthritis, walking and so on.

Table 31. disabilities of the focus group members

Participant number	Disability
1	None
2	Poor hearing
3	None
4	Bad vision
5	Headaches, pain all over the body, diabetic and have arthritis all over the body.
6	None
7	2 knee replacements and back operation with steel re enforcements
8	Weakness, need support to walk, especially for longer distance
9	As a result of stroke, do not walk without assistance (a walker or a crane)

There were four females and five male participants and the age of all the participants was above seventy years. Also, except two participants, rest had some kind of disability. Using this

focus group, RAM Center was visited in the second week of March in 2018. During the visit, focus group was first briefed about the study and was asked to carefully read and sign the consent forms. After getting their consent, they started their visit. The pattern of their movement is shared in Figure 39. They followed the same path that any visitor who is unaware of the facility or coming for the first time would adopt. The focus group entered from parking to the resource center, followed by Lake Ontario lodge and then Lake Erie lodge. Conservation education building was the last facility visited by the group. Finally, they came back to parking and left the facility.

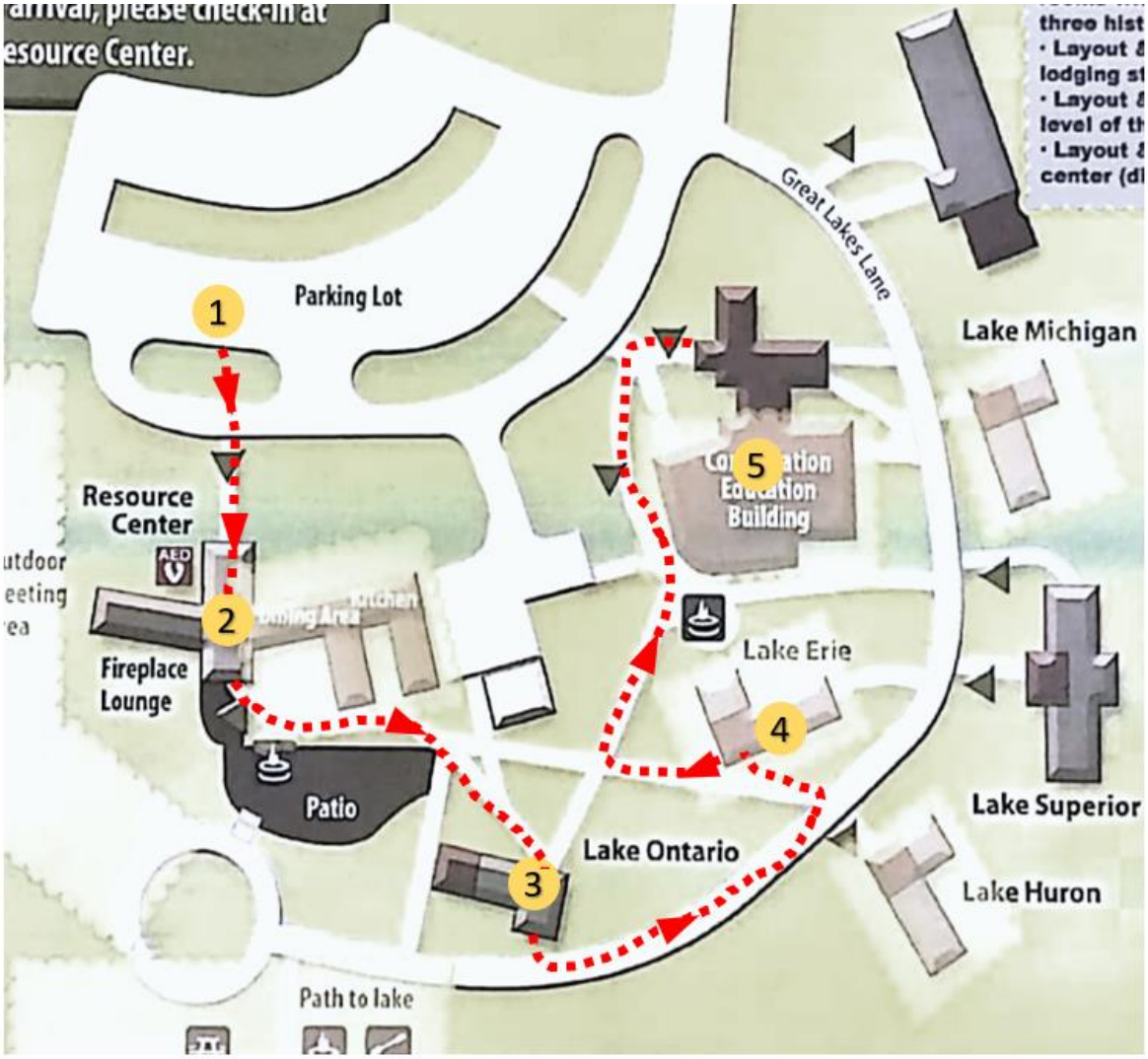


Figure 39. Path followed by focus group (Map credits: RAM Center)

4.2.2 Average Satisfaction of Focus Group Participants with Each Building and Space

The questionnaire used for focus group for each building had eight sections. Seven sections had questions about seven design aspects of the facility and were similar to case studies. These were parking facility, exterior routes, entrance and doorways, interior routes and surfaces, bathrooms, bedrooms, and the signages. The last section of the questionnaire was about demographic information of participant. The final questionnaire is shared in Appendix B.

Majority of the questions in the questionnaire were satisfaction questions. The scale used for these questions was from 1 to 5, 1 being very unsatisfied and 5 being very satisfied. Similar scale was used for questions measuring comfort level of the participants regarding certain design aspects.

Based on the ratings given by each participant to the questions for each facility, an average was calculated. This average is representing percentage satisfaction of the focus group participants regarding the buildings. This percentage is shown in Table 32. Also, in this table, results from case studies are also mentioned representing the compliance of these buildings with inclusive design assessment tool.

Table 32. Average percentage satisfaction of focus group with each building

Buildings	Focus group (Average Percentage Satisfaction for each facility)	Case studies (Percentage Compliance of the buildings with inclusive design assessment tool)
Resource Center	74%	72.88%
Lake Ontario Lodge	69%	47.05%
Conservation Education building	86%	81.10%
Lake Eerie Lodge	69.20%	

Note: To calculate average percentage satisfaction for each facility, average of the ratings given to each question for that facility was first calculated. Then this was divided by 5x no. of questions. lastly, this number was multiplied by 100 to get this percentage.

The results in table 32 indicate that similar pattern exist between the findings of both case studies and the satisfaction level of focus group. In both, conservation education building has the highest rating and the reason behind it could be the compliance of conservation education building with ADA guidelines. The Resource Center building ranks second in both, case studies and focus group satisfaction level. Whereas, Lake Ontario lodge ranks last in both cases.

4.2.3 Average Satisfaction Level of Focus Group with Different Building Design Features

From the satisfaction ratings given by focus group participants to each of the seven design features covered in the questionnaire, an average for each feature was calculated. This is shown in the form of graph in Figure 40.

These average ratings indicate that satisfaction level of the focus group participants with each design feature was above average. The bedrooms, however got least average satisfaction of 3.25 and interior routes and surfaces got highest average satisfaction of 3.97. The average satisfaction of focus group with parking facility, exterior routes, entrance and doorways, bathrooms and signages was 3.49, 3.71, 3.86, 3.63, and 3.59 respectively.

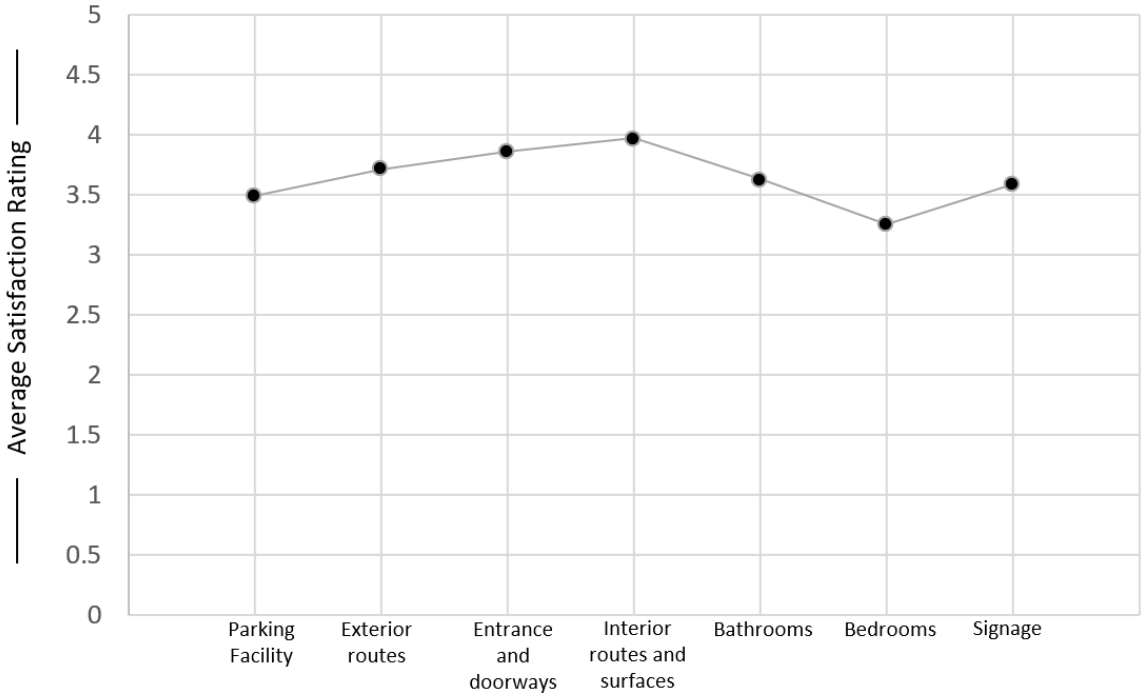


Figure 40. Average Satisfaction of Focus Group with different design features of built facilities

To identify the reasons behind these ratings, participants were asked to comment on major concerns and give recommendations for improvement of these facilities for them.

4.2.4 Recommendations given by the Focus Group Participants

Nine senior citizens who volunteered for this study had diverse physical abilities. Some of them were healthy while others had one of more disabilities. Some of the disabilities that they had were related to vision, hearing, diabetes, arthritis, walking and so on. After completing the questions regarding satisfaction and comfort rating in each section, they were asked to give the reason behind those feedbacks and provide with some recommendations to improve inclusiveness of the facility for them. Their recommendations are discussed below.

4.2.4a Parking

The recommendations given by focus group participants regarding inclusiveness of parking facility can be summarized under four categories. These are signage, distance between parking and building entrance, drop-off areas, and provision of handicapped parking.

RAM Center has a common parking lot serving all of the buildings. The first building accessed, after entering the site was the Resource Center and the last one was Conservation Education building. While commenting on the design of parking facility with respect to these two buildings, one participant wrote "I do not recall seeing eye-level *signage* next to the road pointing to the location of the resource center and the conservation education building. Such signage would be very helpful for a new comer." Another participant found the *distance* between parking lot and lodges to be very long and lacking directional signage to guide the visitors. Commenting on the similar issue, another participant wrote, "There is no signage in the parking area and the building signs are too small to be read by the elderly from the parking lot," some recommended that signage should be bigger, having red color and should be mounted at lower height. Since there was snowfall just few days prior to the site visit, one participant found it difficult to maneuver through parking space commenting "the material on the parking lot was rather difficult because there was snow on

it." Another participant found it unsatisfactory that there was no covered *drop off area* for the visitors. She commented that "the drop off area for our visit was simply an uncovered portion of the road without any weather protection or wheelchair loading/unloading zone etc." "It would be nice to have a U-shaped turn around drop off for people especially those using walkers" recommended by another participant. One participant having a handicapped permit pointed out that there is no *handicapped parking* provided in front of conservation education building. Also, the parking space might get tight in summer, making it problematic for some visitors. Finally, one focus group participant showed his disapproval with a common parking area for all buildings saying that "walking building to building is tougher then driving between buildings."

Figure 41. Entrance of resource center
(Photo credits: Autor)

Figure 42. Path from resource center to Lake Ontario lodge
(Photo credit: focus group participant)

4.2.4b Exterior Route

The recommendations given by focus group participants were majorly related to the material used for the pathways, their width, seating provided on exterior routes, and lighting arrangements on these paths.

During the walk from parking to the entrance of resource center, one participant commented that "walkway was well-maintained and snow removal was good," while another one pointed out lack of public *seating* on the exterior route, recommending that "some seating would be helpful." While moving from resource center to towards Lake Ontario lodge, the pathway was covered in snow making one participant point out that "the sidewalks was rather *narrow*, and the *brick path* was difficult for a person with a walker."

Same issue was reported by another participant, also mentioning the lack of *lighting* on the pathway. One participant recommended that "throughout the site it would be good to find out what the pathways are like after a heavy rain just in case there are large inconvenient puddles or resulting ice patches" affecting people with walkers or wheelchairs. Similar issues were reported while moving from Lake Ontario lodge to Lake Erie lodge. Conservation education building has three entrances, one with stairs and two with ramp. The entrance having stairs was closed and was blocked by snow, making volunteers uncomfortable and unsatisfied.

Figure 43. Snow covered route taken by a walker user (Photo credits: S. Kim)

Figure 44. Snow covered route from resource center to Lake Ontario Lodge (Photo credits: S. Kim)

Figure 45. Snow covered route from Lake Ontario Lodge to Lake Erie Lodge
(Photo credits: S. Kim)

4.2.4c Entrance and doorways

The comments given by focus group participants regarding the entrance and doorways can be summarized under six criteria's regarding inclusive design of entrances and doorways. These are width of the entrance door, force used to open the entrance door, provision of sensors or push buttons for entrance doors, walk-off mats at entrances, light, and furniture provided in the entrance lobby.

The entrance door of the resource center was found quite *heavy* by four participants of the focus group, with one commenting that "the main entrance door was quite heavy, and some people could face difficulty in getting luggage through it." Another participant recommended that "an *automatic door* at the entrance would be a great addition. Not just for handicapped but for senior citizens as well." However, the use of *walk off mats* at the entrance of resource center was appreciated by one participant. Some *sitting space* was also provided in the entrance lobby of the

Resource Center, which was found quite high by focus group members to use. Also, they found the reception counter quite high as well and lacking in appropriate amount of *light*.

While entering Lake Ontario lodge, majority of participants found the doors of the lodge very heavy and the level difference uncomfortable. One participant recommended that entrance of the lodge should be *wider*, having a *ramp* for cranes or wheelchair users. Similar issues were pointed out at Lake Erie lodge. The *steps* at all the entrances of both lodges were found problematic by majority of participants.

Among all buildings, only conservation education building was a new construction having most updated facilities and push button for entrance doors. However, few senior citizens found it hard to identify a push button, and one participant commented that the button was too far from the door. Although, it was a new construction following ADA guidelines, one participant found lack of seating in the lobby, and other two recommended that the seating provided should be flexible and wider than the current chairs provided in its lobby.

Figure 46. Entrance of conservation education building
(Photo credits: Author)

Figure 47. Entrance of Lake Ontario Lodge
(Photo credits: Author)

Figure 48. Entrance of Lake Erie Lodge
(Photo credits: S. Kim)

Figure 49. Senior citizen with walker exiting Lake Ontario Lodge
(Photo credits: S. Kim)

Figure 50. Reception at Resource center
(Photo credit: Focus group participant)

4.2.4d Interior Routes and Surfaces

The recommendations given by focus group participants regarding interior routes and surfaces had several aspects common. These were related to the lobby design, color used for carpets, level changes in floors, flooring material, design of lights, provision of proper light in the interior, and elevator design.

All the interior surfaces were considered in this section of questionnaire. At the Resource Center, one participant found the *area* provided in the *lobby* for reception to be congested. While talking about floor of Resource Center, one participant wrote, “Carpet lacks *color* and must be difficult to maintain. They should get rid of carpeting.” Another one added “Flooring should be bright in color.” Although no one complained about windows or lights, but one participant said that in the lounge room of Resource Center, “Facetted globe lights reflect light such that it *glares* on sunglasses.” This can cause trouble for senior citizens especially those having vision issues or

using sunglasses. In both lodges, *sudden level changes* in the flooring were observed which can cause tripping. One participant commented, “Although carpet tiles are well installed and adequate for wheelchair or walker users, uniformly carpeted floor hides changes in levels or inclines.” The color of the doors in Lake Ontario lodge was appreciated for its brightness, but the hallway was found narrow and *dark* by some participants.

In the Conservation Education building, one participant was unable to identify *elevator* even though it was right in front. Another participant complained about the numbering system inside the elevator to be very confusing. One found the *hallway narrow* at place where soft drink machines were placed. Terrazzo *flooring* was also not apreciated by one participant commenting that “it could be slippery when wet.”

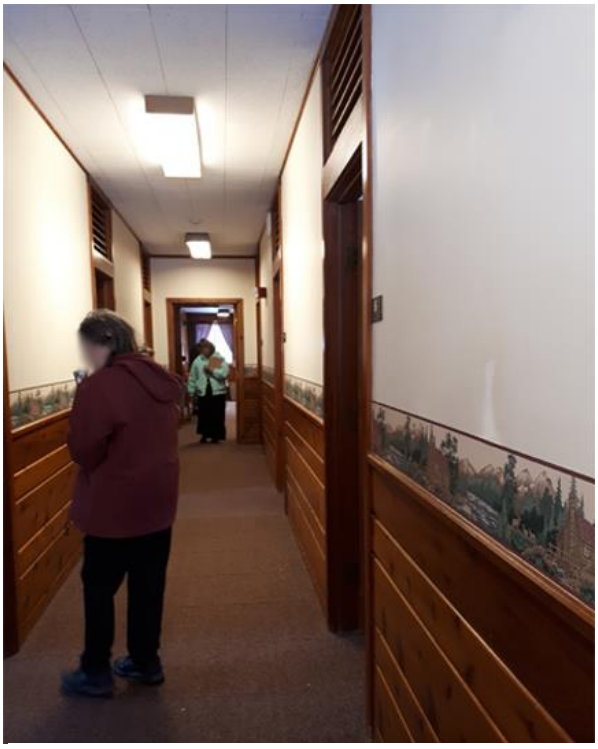


Figure 51. Hallway in Lake Ontario Lodge
(Photo credits: S. Kim)

Figure 52. Carpet flooring inside Lake Erie Lodge hiding level change
(Photo credits: S. Kim)

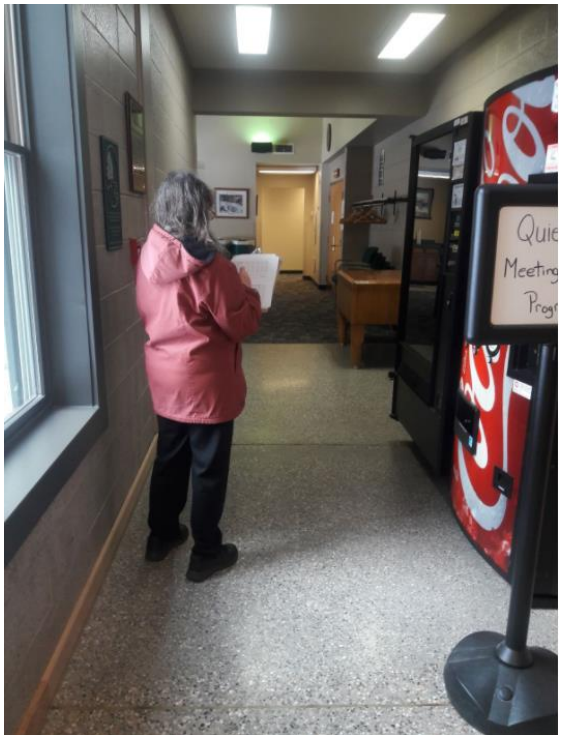


Figure 53. Soft drink machine in the hallway of conservation education building
(Photo credits: Author)

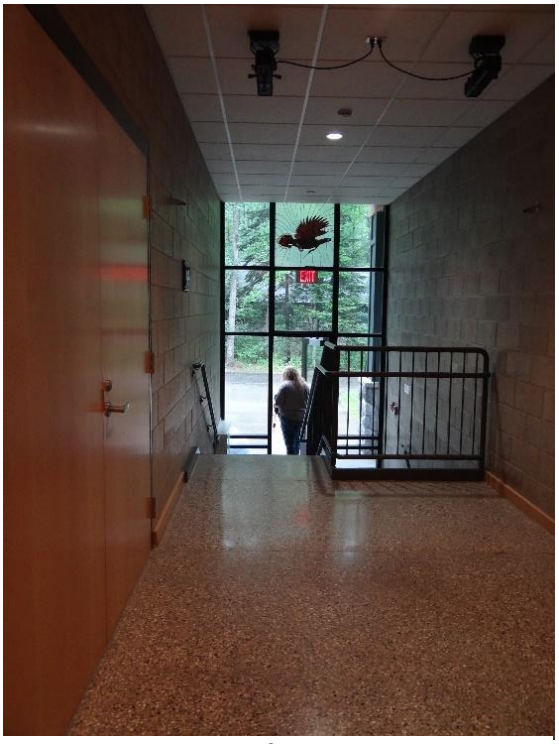


Figure 54. Terrazzo flooring in conservation education building
(Photo credits: Author)

4.2.4e Bathrooms

Several recommendations were given by focus group participants regarding bathroom designs. These can be summarized as per the following categories: 1)The width of bathroom doors, 2) lighting provided inside the bathrooms, 3) number of stalls and urinals provided, 4)provision of grab bars and other security arrangements, 5) height of bathroom fixtures, and 6) flooring materials used bathroom flooring.

The participants appreciated the bathrooms of the Conservation Education Building. They found them "much nicer than the other buildings, welcoming, very modern and well designed." But two participants found the *lighting* in the main bathroom near the elevator to be too dim

making them dark. In other three buildings, several issues were highlighted by the participants for improvement.

In Resource Center, the focus group found the *number of toilets and urinals* provided in the washroom to be less in number for the building usage and the *overall arrangement* to be very tight. The *toilet height* was also criticized for being low for senior citizens and *lacking grab bars* for support. They also found the *height of towel dispenser* and mirror to be very high for a senior citizen, especially for those using walkers or wheel chairs. One female participant reported that "toilet door in female washroom swings differently on two toilets. It can't be seen by a person coming out of the toilet and can hit someone washing his hand or using paper towel dispenser."

Similar issues regarding toilets were reported in two lodges as well. Lake Erie lodge has *unisex bathroom* making some participants unsatisfied with this approach. Also, the *molding design* in the bathroom of Lake Erie lodge was reported by one participant to be dangerous and should be removed. They also recommended different *flooring material* for bathrooms of all three buildings having brighter and lighter color.

Shower areas of both lodges were also lacking security bars for protection making them inaccessible by handicapped, wheelchair bound or otherwise impeded senior citizens. Also, the *door* of bathroom in Lake Erie lodge was found narrow by one participant, commenting that "one must go through public area to enter bathroom and the door is too narrow."

Figure 55. Towel dispenser height in Lake Ontario Lodge (Photo credits: S. Kim)

Figure 56. Bathroom in Lake Ontario lodge missing grab bars
(Photo credits: S. Kim)

Figure 57. Shower area in Lake Ontario lodge missing grab bars
(Photo credits: S. Kim)

Figure 58. Molding in Lake Erie lodge
Photo credits: S. Kim)

Figure 59. Bathroom in Conservation education building
Photo credits: S. Kim)

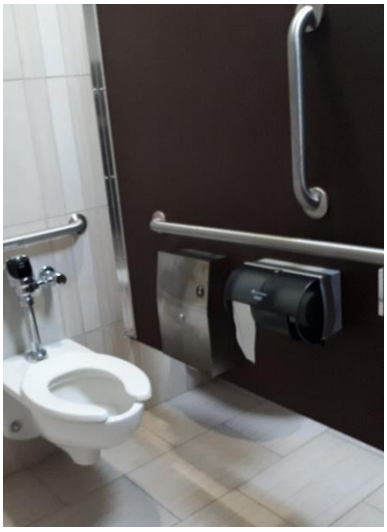


Figure 60. Bathroom stall in conservation education building
(Photo credits: S. Kim)

4.2.4f Bedrooms

The recommendations given by focus group participants regarding bedroom designs were centered around the size of bedrooms, design of furniture, color choice and light inside the bedrooms.

Both lodges had bedrooms for the visitors of RAM Center. While visiting rooms at Lake Ontario lodge, participants found bedrooms to be of very small in *size* considering that they have two beds. Also, one participant found the rooms to be *dark* at the back, lacking reading lamp, and night table or room for luggage. When asked about the beds, one participant commented that "they are a little *too high*" with another one adding "*too soft*" as well. The room was also criticized for poor *color choice* by a participant. Similar issues were reported for the bedrooms at Lake Erie lodge except they were a little big in size than Lake Ontario lodge. One participant while commenting on the size of bedrooms at Lake Erie lodge and the absence of accessibility arrangements wrote "They are quite adequate for their usual use. Camping is not supposed to be glamorous, but it can be safe".

Figure 61. Bedroom in Lake Erie Lodge
(Photo credits: S. Kim)

4.2.4g Signage and Wayfinding

The recommendations given by focus group participants regarding signage and wayfinding information provided in the four buildings visited can be summarized under few categories. These are lack of wayfinding information, height of mounted signage, font used for signages, color and material selection for signs, and location of emergency exit signs.

For a visitor coming to a facility for the very first time, signage is the primary source of information that can facilitate him to independently move around. Except in Conservation Education building, all other buildings visited by focus group were *lacking wayfinding* information provided at the entrance. One participant faced this problem at Lake Erie lodge and recommended that "the signage is needed to locate the main sections of the building." While commenting on the wayfinding information provided at conservation education building, one participant said, "The wayfinding board was too *high* and the *writing font* on the signs too small for seniors, possibly for anyone." Another participant commented that conservation education building "is designed as a storm shelter, but I see no external sign to point to it in case of a storm. The storm shelter signs on the doors of the buildings are way too small. Isn't there a universally coded non-verbal sign for shelter?"

Considering that RAM center is a park facility, many participants of the focus group appreciated the use of wooden signages inside the buildings. However, except in conservation education building, they found it hard to read those signs in all other three buildings. It was because wooden alphabets on wooden boards were used for signs. Focus group participants recommended use of contrast between background and the lettering with some recommending use of bright *colors*. They further commented that room signs are mounted too high for them in all four buildings and should be mounted little lower or on the side of each door. Majority of focus group members

were able to locate *emergency exit signs* in all the buildings, however, in conservation education building, one participant commented that "the emergency exit sign does not look like emergency exit. There should be red shading light on either side of emergency exit sign."

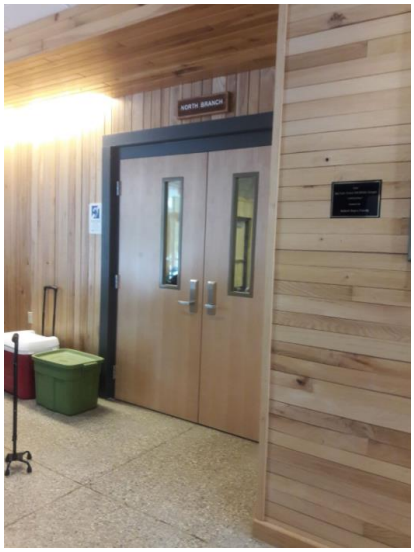


Figure 62. Mounted signage in conservation education building
(Photo credits: Author)

Figure 63. Wooden letters on wooden board as signage in resource center
(Photo credits: Author)

Figure 64. Way finding information provided at conservation education building
(Photo credits: Author)

Figure 65. Exit sign in resource center
Photo credits: Author)

Figure 66. Exit sign at conservation education building
(Photo credits: Author)

CHAPTER 5: DISCUSSIONS

The purpose of this study was to assess the inclusiveness of state park buildings in Michigan and to find out user perception regarding their design. To meet the objectives set forth for this study, it was divided into two phases. In the first phase, six state park buildings in three state parks of Michigan were assessed as case studies. In the second phase, a focus group was taken to one of these state parks to find out their perception regarding inclusiveness of the buildings. The findings are discussed in this chapter.

5.1 Adopting Inclusive Design Approach for the Study

Several design approaches have been introduced around the world, which aim at achieving accessibility. These approaches include accessible design, design for all, barrier free design, universal design and so on. All of these have different historical background but aim for similar goal (Persson et al., 2015). For the present study, inclusive design had been adopted.

The reason behind opting inclusive design for this study was because of its impression of including rather than excluding and its evolution in considering diversity, not just in terms of age and ability, but also in terms of social and cultural differences, gender and sexuality (Heylighen et al., 2017). Many practitioners, however, believe that both universal and inclusive design have nearly same meaning and can be used interchangeably. But inclusive design is acknowledged as a broader concept than universal design by Dr. Scott Rainns, a disability consultant, as it embraces diversity in social and economic circumstances as well (Nussbaumer, 2011). Universal design is also described as a “discrete form of design with its own principles” (Clarkson & Coleman, 2015) having “no practical limits” (Vanderheiden, 2009). Furthermore, Ostroff (2001) mentioned that in

the US, many architects adopt universal design as a trendy term for denoting compliance of the buildings with ADA guidelines. Therefore, inclusive design has been adopted for this study.

5.2 Inclusive Design Assessment Tool and Case Studies

In the phase 1 of the study, six buildings in three state parks of Michigan were assessed as case studies. To assess these buildings, an inclusive design assessment tool was created. There were seventy-seven total guidelines in this tool which were assessed in each of the six buildings visited. To develop this tool, Nussbaumer (2011) was used as primary source along with an accessibility checklist provided by DNR in Michigan which they used as an assessment tool for park buildings. DNR checklist was used for the guideline related to bathrooms and bedrooms.

Inclusive design assessment tool used for this study was very basic in nature, not including any measurements or minute details regarding building design. It was in the form of questions that a designer, one should answer to move the product towards inclusiveness. The tool is shared in Appendix A and has seven sections. These sections are about seven design aspects of a built facility including parking facility, exterior routes, entrance and doorways, interior routes and surfaces, bathrooms, bedrooms, and signage and wayfinding information.

After development of the tool, it was used to conduct case studies in three state parks (i.e. Ludington state park, RAM center, Holland state park). Total six buildings were assessed using this tool. The compliance percentage of the buildings with the tool was in the order of *conservation education building (81%) > resource center (72.88%) > beach house (67.70%) > Lake Michigan beach house (60%) > Concessions (50%) > Lake Ontario Lodge (47.05%)*. Conservation education building, Lake Ontario lodge and resource center were at RAM center, beach house and concessions were at Ludington state park, and Lake Michigan beach house was at Holland state park.

The highest compliance of the Conservation Education building with the inclusive design assessment tool could be because conservation education building was relatively a new construction, complying with ADA guidelines. However, the rest were old constructions, either complying with ADA partially or not complying at all.

5.3 Using Focus Group for Perceived Accessibility of State Park Buildings

To find out user perception regarding inclusiveness of state park buildings, focus group was used. Focus group is one of the methods to gather information regarding diverse user needs as focus group is considered a representative of the whole population (Breen, 2006), and provides an opportunity for "in-depth discussion and exploration of issues" (Clarkson et al., 2003). There can be different focus groups, each having different target users. For present study, a focus group with senior citizens was used to find out their perception regarding inclusiveness of state park buildings. The reason for having senior citizens for present study is because multiple impairments are more common among senior citizens as compared to young generation (Clarkson et al., 2003). They can therefore, provide more information about multiple issues that they are having, facilitating the designers to improve the overall design for all, as Clarkson et al. (2003) mentioned "Design for older and disabled people and you could be designing for everybody" (p.572).

For this study, nine senior citizens with ages 70 years or more were recruited as focus group participants from Lansing and East-Lansing areas of Michigan. After recruitment, focus group participants were taken to RAM Center and visited four buildings there. Three of these buildings were assessed in case studies as well. The questionnaire used for each building had seven sections and last part of the survey was common. The seven sections were about parking facility design, exterior route, entrance and doorways, interior routes, bathrooms, bedrooms, and signage and

wayfinding information. The last section of the overall survey was about demographic information of the participants.

The average satisfaction level of focus group participants with the four buildings visited at RAM Center was in the order *conservation education building (86%) > resource center (74%) > Lake Erie Lodge (69.20%) > Lake Ontario Lodge (69%).* The highest satisfaction of users with the inclusiveness of conservation education building could be because of its compliance with ADA.

A frequency distribution chart was also created from the satisfaction ratings given by focus group participants to questions regarding each of the seven-design features of the buildings. Using this bar chart, average rating was calculated for each design feature. The findings indicated above average satisfaction of focus group participants with each design feature. Interior routes and surfaces had highest average of 3.97 and bedrooms had least average of 3.25. The average rating of all these features was in the order *interior routes and surfaces (3.97) > entrance and doorways (3.86) > exterior routes (3.71) > bathrooms (3.63) > signage and wayfinding information (3.59) > parking facility (3.49) > bedrooms (3.25).* The above average satisfaction with each design feature replicates the findings of previous study (Kadir & Jamaludin, 2012). However, participants gave several design recommendations which would improve overall experience of facility for them by enhancing its inclusiveness.

5.4 Comparison Between Case Studies and Focus Group Findings

Six buildings in three state parks were assessed using inclusive design assessment tool in phase 1. In phase 2 of this study, four buildings in one of these state parks were visited by focus group participants to share their perception regarding their inclusiveness.

In both of these phases, three buildings were common. These were Conservation Education building, Resource Center and Lake Ontario lodge. The findings of case studies indicated highest compliance of conservation education building with inclusive design assessment tool and least compliance of Lake Ontario lodge with the tool. Similar pattern was seen in the results of focus group study. Participants of focus group showed highest average satisfaction with the design of conservation education building and least average satisfaction with the design of Lake Ontario lodge.

In the first phase of this study, bedrooms showed least compliance with the inclusive design assessment tool. Similar results were noticed in phase two as focus group participants gave least satisfaction ratings to bedroom design. These findings indicate that some relationship exist between the tool used for case studies and satisfaction level of users regarding inclusiveness of buildings. This tool can, therefore, be used as a basic instrument to roughly estimate user satisfaction with any building. Elaborating this tool by incorporating more user needs in it will make it even more accurate in this regard.

5.5 User Needs and Using their Feedback in Making Products Inclusive

In the second phase of the study, focus group participants gave several design recommendations to improve inclusiveness of state park buildings for them. Having this knowledge about user needs would facilitate both designers and decision makers in meeting the goal of inclusive built environment. Meeting only ADA guidelines is not enough in this regard as

Clarkson et al. (2003) indicated that ADA guidelines are minimum requirements. There are several design decisions that rest on the shoulders of designers or decision makers. These decisions can either improve or reduce inclusiveness of any design for diverse users. Inclusive design, therefore, in its first principle talks about putting people at the heart of design by incorporating future users at every step of design process. This would help designers to develop an empathy with the diverse user group and to have better understanding of their needs.

The design decisions taken by designers have an impact on users and this study highlights this issue. To understand the effect design has on users, focus group is a very helpful instrument which gives an opportunity to discuss the problems in depth. The design recommendations given by focus group participants in this study highlights their diverse needs and further strengthens the idea of including them in the design process for inclusive design. Replicating this study using different focus groups (i.e., children, disabled students, pregnant women etc.) or future and current employees can provide designers with immense knowledge regarding user needs. Using this knowledge to take design decisions would ultimately improve inclusiveness of final product.

CHAPTER 6: CONCLUSION AND SUGGESTIONS

6.1 Conclusion

This study aimed at facilitating Department of Natural Resources (DNR), MI to meet their goal of taking state park facilities beyond ADA guidelines. To achieve this goal, inclusive design, which is a broader concept to achieve accessibility for diverse users was adopted for this study. It is defined as "the design of mainstream products and/or services that are accessible to, and usable by, as many people as reasonably possible ... without the need for special adaptation or specialized design." (The British Standards Institute, 2005). In order to facilitate Michigan Department of Natural Resources (DNR) in taking state park facilities beyond ADA guidelines, six of the state park buildings were assessed for inclusiveness in the first phase of this study. This was done using an inclusive design assessment tool shared in Appendix A. In phase two of this study, user perception regarding state park buildings was also measured.

In the first phase, six buildings were assessed using the assessment tool, and in the second phase four buildings were visited by focus group to find out user perception. Three buildings were same in both phases (i.e. resource center, conservation education building, and Lake Ontario lodge. All three buildings were at RAM center). The findings for these three buildings follow same pattern for both phases. Only conservation education building was complying with ADA in all the buildings and had highest compliance rate with the inclusive design assessment tool. Users also showed highest satisfaction level with this building regarding its inclusiveness. Resource center ranked second in both phases and Lake Ontario lodge ranked third. This indicates direct relationship between the inclusive design assessment tool and user perception regarding inclusiveness.

A frequency distribution chart was also developed to evaluate satisfaction of focus group participants with seven design features of the facilities visited. These were parking facility, exterior route, entrance and doorways, interior routes, bathrooms, bedrooms, and signage and wayfinding information. The findings indicate above average satisfaction level of the focus group participants with each of these aspects of the built facilities. These results replicate the finding of previous similar studies (Kadir & Jamaludin, 2012). However, these findings also indicate that the participants of focus group were not hundred percent satisfied with the inclusiveness of any of the design feature.

This means that there are several design aspects that need improvement or incorporation in current buildings in order to improve perceived accessibility of the users. But, to make improvements in building designs regarding inclusiveness, it is very important to have a complete knowledge about needs and desires of diverse user groups. This can only be achieved by getting feedback from users or by incorporating them in the design process. This is what the first principle of inclusive design also promotes. Users should be incorporated in the design process. This would facilitate in making product inclusive along with promoting well-being of the users. Therefore, in present study, focus group participants were asked to give recommendations to improve state park buildings as per their needs. Their recommendations are useful to improve inclusiveness of state park buildings.

Finally, this study taught many important things. One important thing learned from this study is that there are several minute details in building design which can exclude or include users. It is very important to fully comprehend the effects that design decisions have on future users to improve inclusiveness of the product. This would also improve satisfaction level of the users and will have positive impact on their well-being. The process of this study taught relationship between

different data sets. Using inclusive design assessment tool for building assessment can give an estimate about satisfaction level of the users of that building. Elaborating this tool will make this this more reliable tool to estimate satisfaction level of the users regarding built facilities.

6.2 Design Implications for Inclusiveness in State Park Buildings

To improve inclusiveness of state park buildings, focus group participants gave several design recommendations. These recommendations could help a designer and decision makers to make well- informed and successful design decision which would improve inclusiveness of the final product.

6.2.1 Parking Facility

Any facility having common parking area serving different buildings, *accessible parking* spots should be provided with each building. This would make buildings more accessible for people having walking disability or uses wheelchair or walker. In addition to this, *covered drop-off* areas should also be designed in every public building. Since the *signage* in parking areas provide directional information to the visitors of any facility, these should be at eye-level, bright in color and have big font size. This will facilitate senior citizens having vision problems to notice and read them. In areas having frequent snow falls, parking lots or pathways should be cleared out regularly. Since *snow can hide puddles* and so on, which could prove to be dangerous, not just for senior citizens, but for every other visitor as well.

6.2.2 Exterior Routes

The paths leading from parking space to the entrance of the building should be *wide enough* for wheel chairs. *Sitting areas* should also be provided along with these paths, even if the distance is not too long. Some senior citizens are weak and might need to sit down after small intervals. In case there are two paths leading towards the entrance of any building, both should have *ramp and stairs*. If they don't have this provision, then visitors should be informed about it via *wayfinding information* or *signage*.

6.2.3 Entrance and Doorways

Some senior citizens might find it hard to *identify main entrance* in building's façade. Therefore, it should be properly marked. The entrance doors should be *automatic* or have *push buttons* for them. These buttons should also be kept near the door and *marked properly* for the visitors to identify them. If there are steps at the entrance, it should be properly communicated through *signage* or *colors* as some people suffering from vision problems might not be able to identify them otherwise. In the entrance lobby, the design of the furniture provided should be comfortable for senior citizens, as some face change in height with age or use walkers or wheel chairs.

6.2.4 Interior Routes and Surfaces

The size of the *entrance lobby* should be appropriate to avoid congestion. *Floors* should also have some *color variations* as some senior citizens might find similar colors throughout dull. This also makes it difficult for some senior citizens to identify any level changes in the floors. The *material of the floor* should also be selected intelligently as terrazzo or some varieties of tiles can be slippery when wet causing accidents. *Elevators* should also be *properly marked* as for some senior citizens, especially those having vision problems, it is hard to identify an elevator if it is not marked properly or flashed together with the wall.

6.2.5 Bathrooms

Bathrooms should have all the *security arrangements* for disabled users. In shower area, *tubs or level changes* should be avoided to facilitate wheelchair users, people having vision problems, etc. the *color* selection for bathrooms should be light in tone and bright, as majority of senior citizens recommended this. Small design elements in bathrooms (i.e., *molding design*, etc.)

should be considered very carefully. Sharp edges of molding or furniture at low height could be dangerous for kids and older people.

6.2.6 Bedrooms

The *size* of bedrooms in any public facility should have appropriate size to facilitate wheelchair users. The *height and width* of the *furniture* used should be decided with respect to variety of visitors who'll be using them. For example, senior citizens would prefer chairs with low seating and wider in size than able bodied person who can easily accept any size or shape. The *material* used for the *mattress* should also be considered carefully as senior citizens do not feel comfortable on soft mattresses.

6.2.7 Signage and Wayfinding

The location of signage and wayfinding information in any building is very important to facilitate the users. They should have proper *light arrangement* to make it easier for newcomers to notice them. The *height* of mounted signage in any building should also be considered very carefully to facilitate the diverse user group. *Contrasting color* should be used for writing and background, along with appropriate *font size* to facilitate those having vision problems. Using etching on wood without using any color should be avoided as many senior citizens reported it to be very hard for them to read.

Table 33 represents the design guidelines that were in inclusive design assessment tool used in case studies and design recommendations given by focus group participants.

Table 33. Design Implications for state park buildings

Parts of Built Facility		Design Guidelines	● In Assessment tool ● Recommended by Focus group
Parking Facility	1	Is there a priority parking close to the entrance for different users?	● ●
	2	Is the parking lot safe and secure? (To increase safety and prevent speeding, speed bumps and slow signs are strategically designed in the parking lot)	● ●
	3	Is the parking lot illuminated?	● ●
	4	Are all pathways illuminated?	● ●
	5	Are there optional pathways to access the entrance?	● ●
	6	Are all pathways easily accessible?	● ●
	7	Are all path ways free of obstacle?	● ●
	8	Is the pathway easy to maneuver?	● ●
	9	Is the passenger loading zone illuminated?	● ●
	10	Is a protective covering provided over loading zone?	● ●
	11	Are all paths of travel illuminated or easily located?	● ●
	12	In case of common parking for all buildings in a facility, is there accessible parking spots with each building?	●
	13	Is there a properly designed loading/unloading zone?	●
	14	Is parking lot cleared out in areas having snow? (as snow can cover puddles and cracks etc.) making it dangerous for visitors.	●
Exterior Routes	15	Are all walking surfaces stable and firm?	● ●
	16	Are all walking surfaces smooth and leveled?	● ●
	17	Do all hard or resilient floor coverings have non-slip finishes?	● ●
	18	If floor changes coverings are needed, are they within a half inch?	● ●
	19	Are colors easy on the eyes?	● ●
	20	Are materials non-reflective?	● ●
	21	Are pathways wide enough for wheelchair users?	●
	22	Is there sitting areas provided on exterior pathways?	●
	23	In case of two pathways leading to the entrance, does both have ramp and stairs?	●
	24	If both pathways leading towards an entrance do not have ramp and stairs, is there signage or wayfinding information provided for the users to guide them?	●

Table33. (cont'd)

Entrance and Doorways	25	Is the entrance door on a sensor?	● ●
	26	If not, is it easy to maneuver through the door with packages, strollers, small children, arthritic hands, canes, crutches, or wheelchairs?	● ●
	27	Is the pathway clear at the entrance?	● ●
	28	Is the entrance also an emergency egress?	● ●
	29	Is the accessible entrance separate or same for everyone?	● ●
	30	Does the door automatically sense that someone's arriving?	● ●
	31	Is the door easy for everyone to open if the sensor is not used? (Handles, locks, and latches operable with one hand and without requiring tight pinching, tight grasping or twisting of the wrist)	● ●
	32	Is there plenty of clear floor space in the entrance of lobby?	● ●
	33	Is enough space allowed for groups of people to meet without blocking the entrance of affecting circulation?	● ●
	34	Is the (emergency) escape route safe, easy to locate, and well-marked?	● ●
	35	Is a place of refuge provided for emergency use?	● ●
	36	Are all entry doorways automated or on grade?	● ●
	37	Is there seating for people who must wait?	● ●
	38	Is seating conveniently located to amenities, such as fountains telephones, waste receptacles and restrooms?	● ●
	39	Are amenities adjustable or alternative heights?	● ●
	40	In case of push button provided for the entrance door, is it easy to locate it?	●
	41	Is there proper light provision with amenities?	●
Interior Routes and Surfaces	42	Does an elevator or ramp connect every level?	● ●
	43	Is the elevator lobby close to entrance or an important entrance function?	● ●
	44	Are all buttons on the appropriate level and easy to locate?	● ●
	45	If elevators are not appropriate, is there escalator, a moving pathway or a method of moving large number of people quickly?	● ●
	46	Is there a voice activated announcement or color coding provided when there are changes in elevation, movement or a similar change?	● ●
	47	Is there a plenty of clear floor space to make a 180 degree turn in the elevator lobby for a large group, wheelchairs, strollers or to pull luggage?	● ●
	48	Are transitional spaces such as hallway or corridor illuminated?	● ●
	49	Are transitional spaces devoid of obstacles?	● ●
	50	Are transitional spaces are wide enough to accommodate a group of people?	● ●
	51	Are all walking surfaces stable and firm?	● ●
	52	Are all walking surfaces smooth and leveled?	● ●
	53	Do all hard or resilient floor coverings have non-slip finishes?	● ●
	54	If floor changes coverings are needed, are they within a half inch?	● ●
	55	Are colors easy on the eyes?	● ●
	56	Are materials non-reflective?	● ●

Table33. (cont'd)

	57	Is the elevator easily identifiable for people having vision issues? (this can be done using different color for elevator, instead of flushing it with the wall, or having same finish as wall)	●
	58	Is there proper identification of level change in floor (using different colors or patterns) to facilitate people having vision problems?	●
Bathrooms	59	If toilet rooms are available to the public, is at least one toilet room/stall accessible?	● ●
	60	If not all toilet rooms are accessible, are there signs that give directions to accessible toilet rooms?	● ●
	61	If not all toilet rooms are accessible, is there a sign at the accessible toilet room with the International Symbol of Accessibility?	● ●
	62	Do the signs identifying the bathroom gender accessible?	● ●
	63	If there is a privacy wall at the entrance of the restroom and the door swings out, is there adequate maneuvering space beyond the door of, at least 24" of maneuvering clearance beyond the latch side of the door and 42" between the privacy wall and doorway?	● ●
	64	In a single user toilet room if the door swings in over the required clear floor space is there adequate space, of 30"x48", for a wheelchair beyond the swing of the door?	● ●
	65	Door opening: Is there a 32" clear opening; pocket present?	● ●
	66	Is there slip resistant tile on floor	● ●
	67	Towel bars are located at varied heights	● ●
	68	Grab bars are given in toilet	● ●
	69	Mirrors are located at such height to facilitate seated people as well.	● ●
	70	There are grab bars in shower areas	● ●
	71	There is a walk-in shower rather than a tub	● ●
	72	Is the color of bathrooms bright?	●
	73	Is there any molding design at less than 5', which can be dangerous for kids or old people?	●
Bedrooms	74	Are rooms easily accessible or adaptable for various needs?	● ●
	75	Is at least one of each type of lodging accessible?	● ●
	76	Does at least one sleeping area provide a 30"x48" area of clear space on both sides of the bed	● ●
	77	Is there adequate turning space of 60" diameter circle or a T-shaped space within a 60" square within each room with accessible features of the cabin?	● ●
	78	Are rooms fully accessible of adaptable for various needs	● ●
	79	Is the mattress soft or hard?	●

Table33. (cont'd)

Signage and Wayfinding	80	Is there good signage that indicates the entrance?	● ●
	81	Is the welcome, information, registration desk, or other similar area easy to locate?	● ●
	82	Is the space easy to circulate with appropriate signage, markers and other wayfinding devices?	● ●
	83	Is the (emergency) escape route safe, easy to locate, and well-marked?	● ●
	84	Are exit signs illuminated at the floor levels?	● ●
	85	Are there visual and audible signaling systems?	● ●
	86	Is a directory and wayfinding information provided that includes visuals, tactile and audible forms?	● ●
	87	If not at the entrance, is there directional signage to guide people to their destinations?	● ●
	88	Does signage have tactile characters, well pronounced and easy to read fonts, good contrasts and braille?	● ●
	89	Is signage mounted at the required heights?	● ●
	90	Is the room numbered system logical so that it is easy to find rooms?	● ●
	91	Is there an audio signage for key destinations?	● ●
	92	Is there proper light provided for signage and wayfinding information?	●

6.3 Limitations and Future Implications

In this study, the inclusive design assessment tool proved to be very helpful in assessing inclusiveness of state park buildings. However, it was kept very basic because of time limitation for this study. In future, this tool can be elaborated to conduct more detailed case studies.

The design guidelines recommended by focus group participants also need further investigation on micro level. This would help find out minute details and several measurements related to building elements which facilitate the users. Also, the guidelines are for one building type only i.e., state park buildings. Further research is needed to find out guidelines that can be generalized or applicable to other building types as well.

Majority of the participants recruited for focus group were approached through personal contacts and ended up knowing each other. This could have caused "acquaintance bias" which means that if participants know each other, they could influence each other's responses. in future studies, this bias should be removed through proper screening criteria.

Finally, to improve inclusiveness of buildings for diverse user group, similar study should be conducted with varied focus groups. Using diverse focus groups (i.e., having kids, disabled students, pregnant women etc.) would provide designers with immense knowledge that would facilitate towards making successful design decisions. The final product after this process would not only facilitate people with special needs, instead it would make it a success among able bodied people as well (Clarkson et al., 2003).

APPENDICES

APPENDIX A: Inclusive Design Assessment Tool

Parking Facility	
1	Is there a priority parking close to the entrance for different users?
2	Is the parking lot safe and secure? (To increase safety and prevent speeding, speed bumps and slow signs are strategically designed in the parking lot)
3	Is the parking lot illuminated?
4	Are all pathways illuminated?
5	Are there optional pathways to access the entrance?
6	Are all pathways easily accessible?
7	Are all path ways free of obstacle?
8	Is the pathway easy to maneuver?
9	Is the passenger loading zone illuminated?
10	Is a protective covering provided over loading zone?
11	Are all paths of travel illuminated or easily located?
Exterior Routes	
12	Are all walking surfaces stable and firm?
13	Are all walking surfaces smooth and leveled?
14	Do all hard or resilient floor coverings have non-slip finishes?
15	If floor changes coverings are needed, are they within a half inch?
16	Are colors easy on the eyes?
17	Are materials non-reflective?
Entrance and Doorways	
18	Is the entrance door on a sensor?
19	If not, is it easy to maneuver through the door with packages, strollers, small children, arthritic hands, canes, crutches, or wheelchairs?
20	Is the pathway clear at the entrance?
21	Is the entrance also an emergency egress?
22	Is the accessible entrance separate or same for everyone?
23	Does the door automatically sense that someone's arriving?
24	Is the door easy for everyone to open if the sensor is not used? (Handles, locks, and latches operable with one hand and without requiring tight pinching, tight grasping or twisting of the wrist)
25	Is there plenty of clear floor space in the entrance of lobby?
26	Is enough space allowed for groups of people to meet without blocking the entrance of affecting circulation?
27	Is the (emergency) escape route safe, easy to locate, and well-marked?
28	Is a place of refuge provided for emergency use?
29	Are all entry doorways automated or on grade?
30	Is there seating for people who must wait?

31	Is seating conveniently located to amenities, such as fountains telephones, waste receptacles and restrooms?
32	Are amenities adjustable or alternative heights?

Interior Routes and Surfaces

33	Does an elevator or ramp connect every level?
34	Is the elevator lobby close to entrance or an important entrance function?
35	Are all buttons on the appropriate level and easy to locate?
36	If elevators are not appropriate, is there escalator, a moving pathway or a method of moving large number of people quickly?
37	Is there a voice activated announcement or color coding provided when there are changes in elevation, movement or a similar change?
38	Is there a plenty of clear floor space to make a 180 degree turn in the elevator lobby for a large group, wheelchairs, strollers or to pull luggage?
39	Are transitional spaces such as hallway or corridor illuminated?
40	Are transitional spaces devoid of obstacles?
41	Are transitional spaces are wide enough to accommodate a group of people?
42	Are all walking surfaces stable and firm?
43	Are all walking surfaces smooth and leveled?
44	Do all hard or resilient floor coverings have non-slip finishes?
45	If floor changes coverings are needed, are they within a half inch?
46	Are colors easy on the eyes?
47	Are materials non-reflective?

Bathrooms

48	If toilet rooms are available to the public, is at least one toilet room/stall accessible?
49	If not all toilet rooms are accessible, are there signs that give directions to accessible toilet rooms?
50	If not all toilet rooms are accessible, is there a sign at the accessible toilet room with the International Symbol of Accessibility?
51	Do the signs identifying the bathroom gender accessible?
52	If there is a privacy wall at the entrance of the restroom and the door swings out, is there adequate maneuvering space beyond the door of, at least 24" of maneuvering clearance beyond the latch side of the door and 42" between the privacy wall and doorway?
53	In a single user toilet room if the door swings in over the required clear floor space is there adequate space, of 30"x48”, for a wheelchair beyond the swing of the door?
54	Door opening: Is there a 32” clear opening; pocket present?
55	Is there slip resistant tile on floor
56	Towel bars are located at varied heights
57	Grab bars are given in toilet
58	Mirrors are located at such height to facilitate seated people as well.
59	There are grab bars in shower areas
60	There is a walk-in shower rather than a tub

Bedrooms	
61	Are rooms easily accessible or adaptable for various needs?
62	Is at least one of each type of lodging accessible?
63	Does at least one sleeping area provide a 30"x48" area of clear space on both sides of the bed
64	Is there adequate turning space of 60" diameter circle or a T-shaped space within a 60" square within each room with accessible features of the cabin?
65	Are rooms fully accessible of adaptable for various needs
Signage and Wayfinding Information	
66	Is there good signage that indicates the entrance?
67	Is the welcome, information, registration desk, or other similar area easy to locate?
68	Is the space easy to circulate with appropriate signage, markers and other wayfinding devices?
69	Is the (emergency) escape route safe, easy to locate, and well-marked?
70	Are exit signs illuminated at the floor levels?
71	Are there visual and audible signaling systems?
72	Is a directory and wayfinding information provided that includes visuals, tactile and audible forms?
73	If not at the entrance, is there directional signage to guide people to their destinations?
74	Does signage have tactile characters, well pronounced and easy to read fonts, good contrasts and braille?
75	Is signage mounted at the required heights?
76	Is the room numbered system logical so that it is easy to find rooms?
77	Is there an audio signage for key destinations?

Note: Inclusive design: a universal need. Nussbaumer, 2011, New York, NY: Fairchild Books; Accessibility checklist used by Michigan Department of Natural Resource to assess state park buildings in Michigan.

APPENDIX B: Questionnaire Used for Focus Group

MICHIGAN STATE UNIVERSITY

Initial IRB Application Determination *Exempt*

January 3, 2018

To: Suk Kyung Kim
201 B Human Ecology Building
School of Planning, Design, & Construction

Re: **IRB# x17-1667e** Category: Exempt 2
Approval Date: January 3, 2018

Title: Inclusive design assessment of state park buildings in Michigan: An empirical study using focus group (RC107908)

The Institutional Review Board has completed their review of your project. I am pleased to advise you that **your project has been deemed as exempt** in accordance with federal regulations.

The IRB has found that your research project meets the criteria for exempt status and the criteria for the protection of human subjects in exempt research. **Under our exempt policy the Principal Investigator assumes the responsibilities for the protection of human subjects** in this project as outlined in the assurance letter and exempt educational material. The IRB office has received your signed assurance for exempt research. A copy of this signed agreement is appended for your information and records.

Renewals: Exempt protocols do not need to be renewed. If the project is completed, please submit an ***Application for Permanent Closure***.

Revisions: Exempt protocols do not require revisions. However, if changes are made to a protocol that may no longer meet the exempt criteria, a new initial application will be required. If the project is modified to add additional sites for the research, please note that you may not begin your research at those sites until you receive the appropriate approvals/permissions from the sites.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events, or any problem that may increase the risk to the human subjects and change the category of review, notify the IRB office promptly. Any complaints from participants regarding the risk and benefits of the project must be reported to the IRB.

Follow-up: If your exempt project is not completed and closed after three years, the IRB office will contact you regarding the status of the project and to verify that no changes have occurred that may affect exempt status.

Please use the IRB number listed above on any forms submitted which relate to this project, or on any correspondence with the IRB office.

If we can be of further assistance, please contact us at 517-355-2180 or via email at IRB@msu.edu. Thank you for your cooperation.

c: Rabia Faizan

Office of Regulatory Affairs
Human Research Protection Programs

Biomedical & Health Institutional Review Board (BIRB)

Community Research Institutional Review Board (CRIRB)

Social Science Behavioral/Education Institutional Review Board (SIRB)

4000 Collins Road
Suite 136
Lansing, MI, 48910
(517) 355-2180
Fax: (517) 432-4503
Email: irb@msu.edu
www.hrpp.msu.edu

Michigan State University

Dear Participants,

My name is Rabia Faizan and I am a masters student at Michigan State University. For my master's thesis, I am working on the accessibility of State park buildings in Michigan. Since, state parks are a big source of recreation, accessibility of the buildings in state parks are of equal importance. This survey is related to accessibility of three buildings (i.e., Resource Center, Conservation Education building and Lake Ontario lodge) at Ralph A MacMullan Conference Center.

The primary purpose of this survey is to evaluate level of accessibility in each of the three buildings. Based on the findings, suggestions and recommendations will be shared with Department of Natural Resources, Michigan to incorporate them in renovations and future projects. There is no conflict of interest in this research. The survey will ask you about your perception related to accessibility of different design elements, starting from parking to the interior spaces in each building. The risks of participation are not greater than those ordinarily encountered in daily life.

There is a compensation of $10 for participating in the study. Your response will contribute towards making buildings in state parks of Michigan to be more inclusive and accessible for diverse users. It is anticipated that the questionnaire will take 40 minutes to 1 hour to complete along with the tour of facilities. Participation in this survey is voluntary and you may stop answering any question if you do not feel comfortable.

The final data will be kept confidential and in order to maintain that, please do not write your name anywhere in the questionnaire. If you have any further questions or concerns, please feel free to contact at 517-348-5938 / rabia.khalid58@gmail.com or 517-353-9367 / kimsk@anr.msu.edu.

Sincerely,

Rabia Faizan.
Environmental Design Master's Student,
Michigan State University.

Statement of Consent: I have read the above information and have received answers to any questions. I consent to take part in the research study of "Inclusive design assessment of state park buildings in Michigan: An empirical study using focus group"

_____ _____

Participant's Signature Date

Inclusive Desig Assessment of RAM Center buildings, Michigan

Resource Center

This section is about the perception of accessibility in parking lot of Resource Center

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
1	The directional signage provided at the parking lot.	☐	☐	☐	☐	☐
2	The material used for parking lot.	☐	☐	☐	☐	☐
3	The location of accessible parking spots in parking lot.	☐	☐	☐	☐	☐
4	The drop off area provided with the resource center.	☐	☐	☐	☐	☐
What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
5	I can easily locate entrance of resource center from parking lot.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of parking lot? Would you like to make some recommendations or comments to improve accessibility in parking lot?

_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the exterior route leading from parking space to entrance of Resource Center.

In RAM Center, there is a small pathway at the entrance of resource center, but no distinguished route from parking lot to resource center.	 The exterior pathway at the entrance of resource center
What is your level of satisfaction for the following?	

		Very Unsatisfied 1	Slightly Unsatisfied 2	Neutral 3	Slightly Satisfied 4	Very Satisfied 5
6	The route you took from parking lot to reach the entrance of the resource center.	☐	☐	☐	☐	☐
How much need do you feel of the following?						
		Not at all 1	**2**	**Neutral 3**	**4**	**Very much 5**
7	Designated pathway from parking lot to the entrance of resource center?	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
8	The level of the exterior pathway provided at the entrance of resource center.	☐	☐	☐	☐	☐
9	The width of the exterior pathway provided at the entrance of resource center.	☐	☐	☐	☐	☐
There is no public seating space provided on the exterior route from parking lot to the entrance of resource center. How much need do you feel of the following?						
		Not at all 1	**2**	**Neutral 3**	**4**	**Very much 5**
10	A public seating area on the exterior route from parking to the entrance of resource center.	☐	☐	☐	☐	☐

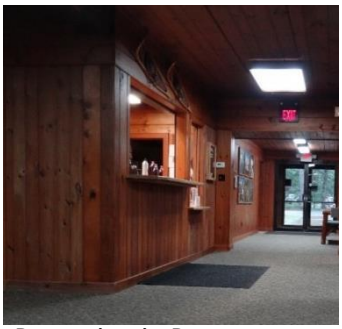
What is your overall perception about the accessibility of exterior route from parking to the entrance of resource center? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the perception of accessibility related to the entrance of Resource Center

Entrance of Resource Center

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
11	I can easily identify main entrance in the main façade of the building.	☐	☐	☐	☐	☐
12	I can easily open the entrance door.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
13	The width of the entrance door.	☐	☐	☐	☐	☐
14	The change in floor finishes at the entrance of Resource Center.	☐	☐	☐	☐	☐
15	The distance between parking and the entrance of Resource Center.	☐	☐	☐	☐	☐



Reception in Resource

Seating provided with the reception at Resource Center

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
16	Counter height at the reception.	☐	☐	☐	☐	☐
17	The space provided in front of reception.	☐	☐	☐	☐	☐

18	The accessibility of seating area provided with the reception.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of the entrance of resource center? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the signage and wayfinding information provided in the Resource Center building

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
19	I can easily locate signage or any other wayfinding information at the entrance of the resource center building.	☐	☐	☐	☐	☐
20	I can easily locate exit signs in the building.	☐	☐	☐	☐	☐
21	I can easily locate emergency exits in the building	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
22	Navigating the building with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐
23	The color used for signage.	☐	☐	☐	☐	☐
24	The writing font used for signage.	☐	☐	☐	☐	☐
25	The height of mounted signage information.	☐	☐	☐	☐	☐

What is your overall perception about the signage or other wayfinding information provided in the resource center building? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the interior surfaces of Resource Center building

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
26	The amount of light in the resource center building.	☐	☐	☐	☐	☐
27	The flooring material inside the Resource Center.	☐	☐	☐	☐	☐
28	The colors of the all interior materials used in Resource Center.	☐	☐	☐	☐	☐
29	The width of hallway in resource center.	☐	☐	☐	☐	☐

What is your overall perception about interior of the resource center building? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the accessibility of bathrooms in Resource Center building

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
30	The location of bathrooms in Resource Center.	☐	☐	☐	☐	☐
31	The width of the entrance door of the bathroom.	☐	☐	☐	☐	☐
32	The layout of the bathroom.	☐	☐	☐	☐	☐
33	The width of the bathroom (space provided inside the bathroom)	☐	☐	☐	☐	☐
34	Accessibility of bathroom stalls.	☐	☐	☐	☐	☐
35	The height of wash basin in bathroom.	☐	☐	☐	☐	☐
36	The width of wash basin in bathroom.	☐	☐	☐	☐	☐
37	The height of mirror in bathroom.	☐	☐	☐	☐	☐
38	The texture of flooring material used in the bathroom.	☐	☐	☐	☐	☐
39	The colors of all interior materials used in the bathroom.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of bathrooms in Lake Ontario lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Lake Ontario Lodge

This section is about the perception of accessing Lake Ontario lodge from Resource Center

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
1	The drop off area provided with the Lake Ontario lodge.	☐	☐	☐	☐	☐
2	Locating Lake Ontario lodge with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of parking lot with reference to Lake Ontario lodge? Would you like to make some recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the exterior route leading from Resource Center to Lake Ontario Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
3	The route you took from resource center to reach the entrance of Lake Ontario lodge.	☐	☐	☐	☐	☐
4	The width of the exterior pathway leading from resource center to Lake Ontario lodge.	☐	☐	☐	☐	☐
5	A public seating area on the pathway leading from resource center to the entrance of Lake Ontario lodge.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of exterior route from resource center to the entrance of Lake Ontario lodge.? Would you like to make some recommendations or comments to improve its accessibility?

This section is about the perception of accessibility related to the entrance of Lake Ontario Lodge.

Entrance of Resource Center

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
6	I can easily identify main entrance in the main façade of the building.	☐	☐	☐	☐	☐
7	I can easily open the entrance door.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
8	The width of the entrance door.	☐	☐	☐	☐	☐
9	The change in floor finishes at the entrance of Lake Ontario lodge.	☐	☐	☐	☐	☐
10	The distance between resource center and the	☐	☐	☐	☐	☐

	entrance of Lake Ontario lodge.					
11	The accessibility of seating area provided inside Lake Ontario lodge.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of the entrance of Lake Ontario lodge? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the signage and wayfinding information provided in the Lake Ontario Lodge.

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
12	I can easily locate signage or any other wayfinding information at the entrance of Lake Ontario lodge.	☐	☐	☐	☐	☐
13	I can easily locate exit signs in the building.	☐	☐	☐	☐	☐
14	I can easily locate emergency exits in the building.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
15	Navigating the building with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐
16	The color used for signage.	☐	☐	☐	☐	☐
17	The writing font used for signage.	☐	☐	☐	☐	☐
18	The height of mounted signage information.	☐	☐	☐	☐	☐

What is your overall perception about the signage or other wayfinding information provided in the Lake Ontario Lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the interior surfaces of Lake Ontario Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
19	The amount of light in Lake Ontario lodge.	☐	☐	☐	☐	☐
20	The flooring material inside Lake Ontario lodge.	☐	☐	☐	☐	☐
21	The colors of the all interior materials used in Lake Ontario lodge.	☐	☐	☐	☐	☐
22	The width of hallway in Lake Ontario lodge.	☐	☐	☐	☐	☐
23	The level change in flooring inside Lake Ontario lodge.	☐	☐	☐	☐	☐

What is your overall perception about interior of the Lake Ontario lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____

This section is about the accessibility of bathrooms in Lake Ontario Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
24	The location of bathrooms in Lake Ontario lodge.	☐	☐	☐	☐	☐
25	The width of the entrance door of the bathroom.	☐	☐	☐	☐	☐
26	The layout of the bathroom.	☐	☐	☐	☐	☐

27	The width of the bathroom (space provided inside the bathroom)	☐	☐	☐	☐	☐
28	Accessibility of bathroom stalls.	☐	☐	☐	☐	☐
29	Accessibility of shower area.	☐	☐	☐	☐	☐
30	The height of wash basin in bathroom.	☐	☐	☐	☐	☐
31	The width of wash basin in bathroom.	☐	☐	☐	☐	☐
32	The height of mirror in bathroom.	☐	☐	☐	☐	☐
33	The texture of flooring material used in the bathroom.	☐	☐	☐	☐	☐
34	The colors of all interior materials used in the bathroom.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of bathrooms in Lake Ontario lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the rooms in Lake Ontario Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
36	The width of the entrance door of the room.	☐	☐	☐	☐	☐
37	The height of the entrance door of the room.	☐	☐	☐	☐	☐

38	Width of the room.	☐	☐	☐	☐	☐
39	Height of the bed in the room.	☐	☐	☐	☐	☐
40	The furniture provided in the room.	☐	☐	☐	☐	☐
41	Window height in the room.	☐	☐	☐	☐	☐
42	The colors of the materials used in the room.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of the room of Lake Ontario lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Lake Erie Lodge

This section is about the perception of accessing Lake Erie lodge from Resource Center

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
1	The drop off area provided with the Lake Erie lodge.	☐	☐	☐	☐	☐
2	Locating Lake Erie lodge with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of parking lot with reference to Lake Erie lodge? Would you like to make some recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the exterior route leading from Resource Center to Lake Erie Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
3	The route you took to reach the entrance of Lake Erie lodge.	☐	☐	☐	☐	☐
4	The width of the exterior pathway leading to Lake Erie lodge.	☐	☐	☐	☐	☐
5	A public seating area on the pathway leading to Lake Erie lodge.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of exterior route leading to the entrance of Lake Erie lodge.? Would you like to make some recommendations or comments to improve its accessibility?

This section is about the perception of accessibility related to the entrance of Lake Erie Lodge.

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
6	I can easily identify main entrance in the main façade of the building.	☐	☐	☐	☐	☐
7	I can easily open the entrance door.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
8	The width of the entrance door.	☐	☐	☐	☐	☐
9	The change in floor finishes at the entrance of Lake Erie lodge.	☐	☐	☐	☐	☐
10	The distance between resource center and the entrance of Lake Erie lodge.	☐	☐	☐	☐	☐
11	The accessibility of seating area provided inside Lake Erie lodge.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of the entrance of Lake Erie Lodge? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____

This section is about the signage and wayfinding information provided in the Lake Erie Lodge.

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
12	I can easily locate signage or any other wayfinding information at the entrance of Lake Erie lodge.	☐	☐	☐	☐	☐
13	I can easily locate exit signs in the building.	☐	☐	☐	☐	☐
14	I can easily locate emergency exits in the building.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
15	Navigating the building with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐
16	The color used for signage.	☐	☐	☐	☐	☐
17	The writing font used for signage.	☐	☐	☐	☐	☐
18	The height of mounted signage information.	☐	☐	☐	☐	☐

What is your overall perception about the signage or other wayfinding information provided in the Lake Erie Lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the interior surfaces of Lake Erie Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
19	The amount of light in Lake Erie lodge.	☐	☐	☐	☐	☐

20	The flooring material inside Lake Erie lodge.	☐	☐	☐	☐	☐
21	The colors of the all interior materials used in Lake Erie lodge.	☐	☐	☐	☐	☐
22	The width of hallway in Lake Erie lodge.	☐	☐	☐	☐	☐
23	The level change in flooring inside Lake Erie lodge.	☐	☐	☐	☐	☐

What is your overall perception about interior of the Lake Erie lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____

This section is about the accessibility of bathrooms in Lake Erie Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
24	The location of bathrooms in Lake Erie lodge.	☐	☐	☐	☐	☐
25	The width of the entrance door of the bathroom.	☐	☐	☐	☐	☐
26	The layout of the bathroom.	☐	☐	☐	☐	☐
27	The width of the bathroom (space provided inside the bathroom)	☐	☐	☐	☐	☐
28	Accessibility of bathroom stalls.	☐	☐	☐	☐	☐
29	Accessibility of shower area.	☐	☐	☐	☐	☐
30	The height of wash basin in bathroom.	☐	☐	☐	☐	☐
31	The width of wash basin in bathroom.	☐	☐	☐	☐	☐
32	The height of mirror in bathroom.	☐	☐	☐	☐	☐
33	The texture of flooring material used in the bathroom.	☐	☐	☐	☐	☐
34	The colors of all interior materials used in the bathroom.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of bathrooms in Lake Erie lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the rooms in Lake Erie Lodge.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
36	The width of the entrance door of the room.	☐	☐	☐	☐	☐
37	The height of the entrance door of the room.	☐	☐	☐	☐	☐
38	Width of the room.	☐	☐	☐	☐	☐
39	Height of the bed in the room.	☐	☐	☐	☐	☐
40	The furniture provided in the room.	☐	☐	☐	☐	☐
41	Window height in the room.	☐	☐	☐	☐	☐
42	The colors of the materials used in the room.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of the room of Lake Erie lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

Conservation Education Building

This section is about the perception of accessibility in parking lot of Conservation Education Building.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
1	The directional signage provided at parking lot.	☐	☐	☐	☐	☐
2	The drop off area provided with the conservation education building.	☐	☐	☐	☐	☐
3	The material used for parking lot.	☐	☐	☐	☐	☐

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
4	I can easily locate accessible parking spots in parking lot.	☐	☐	☐	☐	☐
5	I can easily locate entrance of conservation education building from parking lot.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of parking lot with conservation education building? Would you like to make some recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

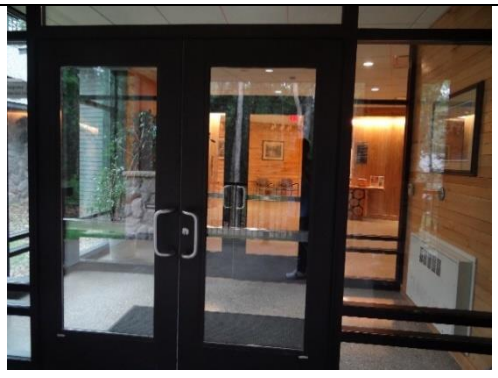
This section is about the exterior route leading from parking space to entrance of Resource Center.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
6	The route you took from parking lot to reach the entrance of conservation education building.	☐	☐	☐	☐	☐
7	The slope of the exterior pathway leading towards the entrance of conservation education building.	☐	☐	☐	☐	☐
8	The width of the exterior pathway leading towards the entrance of conservation education building.	☐	☐	☐	☐	☐
9	Public seating area outside the entrance of conservation education building.	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of exterior route from parking to the entrance of conservation education building.? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____
_____
_____
_____
_____
_____
_____

This section is about the perception of accessibility related to the entrance of Conservation Education Building.



Entrance of conservation education building.

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
11	I can easily identify main entrance in the façade of the building.	☐	☐	☐	☐	☐

12	I can easily open the entrance door.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
13	The width of the entrance door.	☐	☐	☐	☐	☐
14	The change in floor finishes at the entrance of conservation education building.	☐	☐	☐	☐	☐
15	The distance between parking and the entrance of conservation education building.	☐	☐	☐	☐	☐
	The space provided in the entrance lobby	☐	☐	☐	☐	☐
	The accessibility of seating area provided in the entrance lobby	☐	☐	☐	☐	☐

What is your overall perception about the accessibility of the entrance of resource center? Would you like to make some recommendations or comments to improve its accessibility?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the signage and wayfinding information provided in the Conservation Education Building.

What is your level of agreement with the following?						
		Strongly Disagree 1	**Slightly Disagree 2**	**Neutral 3**	**Slightly Agree 4**	**Strongly Agree 5**
19	I can easily locate signage or any other wayfinding information at the entrance of the conservation education building.	☐	☐	☐	☐	☐

20	I can easily locate exit signs in the building.	☐	☐	☐	☐	☐
21	I can easily locate emergency exits in the building.	☐	☐	☐	☐	☐
What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
22	Navigating the building with the help of signage or other wayfinding information.	☐	☐	☐	☐	☐
23	The color used for signage.	☐	☐	☐	☐	☐
24	The writing font used for signage.	☐	☐	☐	☐	☐
25	The height of mounted signage information.	☐	☐	☐	☐	☐

What is your overall perception about the signage or other wayfinding information provided in the resource center building? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the interior space of Conservation Education Building.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
26	The amount of light in the conservation education building.	☐	☐	☐	☐	☐
27	The flooring material inside the conservation education building.	☐	☐	☐	☐	☐
28	The colors of the all interior materials used in conservation education building.	☐	☐	☐	☐	☐
29	The width of hallway in conservation education building.	☐	☐	☐	☐	☐
30	The location of elevators in conservation education building.	☐	☐	☐	☐	☐
31	The size of the elevator.	☐	☐	☐	☐	☐
32	The design of the elevators.	☐	☐	☐	☐	☐

What is your overall perception about interior of the conservation education building.? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

This section is about the accessibility of bathrooms in Conservation Education Building.

What is your level of satisfaction for the following?						
		Very Unsatisfied 1	**Slightly Unsatisfied 2**	**Neutral 3**	**Slightly Satisfied 4**	**Very Satisfied 5**
33	The location of bathrooms in conservation education building.	☐	☐	☐	☐	☐
34	The width of the entrance door of the bathroom.	☐	☐	☐	☐	☐
35	The layout of the bathroom.	☐	☐	☐	☐	☐
36	The width of the bathroom (space provided inside the bathroom)	☐	☐	☐	☐	☐
37	Accessibility of bathroom stalls.	☐	☐	☐	☐	☐
38	The height of wash basin in bathroom.	☐	☐	☐	☐	☐
39	The width of wash basin in bathroom.	☐	☐	☐	☐	☐
40	The height of mirror in bathroom.	☐	☐	☐	☐	☐
41	The texture of flooring material used in the bathroom.	☐	☐	☐	☐	☐
42	The colors of all interior materials used in the bathroom.	☐	☐	☐	☐	☐

What is your overall perception about accessibility of bathrooms in Lake Ontario lodge? Would you like to make any recommendations or comments?

_____
_____
_____
_____
_____
_____
_____
_____
_____

_____
_____
_____

This section is about demographic information

Your age (in years)

- ☐ 50 years or less
- ☐ 51-55
- ☐ 56-60
- ☐ 61-65
- ☐ 66-70
- ☐ 71-75
- ☐ 76-80
- ☐ 81 years or more

Your Gender:

☐ Male	☐ Female	☐ Decline

Your ethnic or cultural group you consider yourself a member of? Please check all that apply.

- ☐ Anglo/White
- ☐ Hispanic/ Chicano/ Latino
- ☐ Asian/ Oriental/ Pacific Islander
- ☐ Prefer not to answer
- ☐ African American/ Black
- ☐ American Indian/ Native American
- ☐ Multiracial
- ☐ Other (please specify) _____

Are you suffering from any disability or disabilities? Please specify

_____
_____
_____
_____
_____
_____
_____

Do you have any other comments or recommendations on the overall accessibility of the buildings surveyed in RAM Center.

_____
_____
_____
_____
_____
_____
_____
_____
_____
_____

REFERENCES

REFERENCES

ANSI: ICC A117. 1-American National Standard for Accessible and Usable Buildings and Facilities. International Code Council:09-129 (1998). Accessed 18 July 2017.

CABE. (2006). The principles of inclusive design (they include you). *Commission for Architecture and the Built Environment*: UK.

Center for Accessible Housing. (1991). *Definitions: Accessible, adaptable, and universal design* (Fact Sheet). Raleigh: North Carolina State University. Accessed 18 July 2017.

Center for Universal Design. (2008). Raleigh, United States: North Carolina States University. Retrieved 23 October 2017 from https://projects.ncsu.edu/ncsu/design/cud/about_ud/udhistory.htm

Clarkson, P. J., & Coleman, R. (2015). History of inclusive design in the UK. *Applied Ergonomics, 46*, 235-247

Clarkson, J., Coleman, R., Keates, S.,& Lebbon, C. (2003) Inclusive design: design for the whole population. London, UK: Springer.

Coleman, R. (1994). The case for inclusive design an overview, 12th triennial congress. International Ergonomics Association and the Human Factors Association of Canada, Toronto, Canada.

Connell, B.R., Jones, M., Mace, R., Mueller, J., Mullick, A., Ostroff, E., Sanford, J., Steinfeld, E., Story, M., Vanderheiden, G. (1997). The principles of universal design. North Carolina State University, The Center for Universal Design. Retrieved 7 August 2017 from https://projects.ncsu.edu/ncsu/design/cud/about_ud/udprinciplestext.htm.

Dillman, D., Smyth, J., & Christian, L. (2009). Internet, mail, and mixed-mode surveys the tailored design method. Hoboken: John Wiley & Sons, Inc.

EIDD: The EIDD Stockholm Declaration 2004. Adopted on 9 May 2004, at the Annual General Meeting of the European Institute for Design and Disability in Stockholm. Design for All Europe (2004). Retrieved 18 July 2017 from https://www.iso.org/obp/ui/#iso:std:iso-iec:guide:71:ed-2:v1:en

Fänge, A., Iwarsson, S., & Persson, Å. (2002). Accessibility to the public environment as perceived by teenagers with functional limitations in a south swedish town centre. *Disability and Rehabilitation: An International, Multidisciplinary Journal, 24*(6), 318-326.

Goldsmith, S., (1997). Designing for the disabled the new paradigm. Bath, Great Britain: Architectural Press.

Hall, P., & Imrie, R. (1999). Architectural practices and disabling design in the built environment. *Environment and Planning B, Planning & Design, 26*(3), 409-425.

Hamraie, A. (2013). Designing collective access: a feminist disability theory of universal design. *Disability Studies Quarterly, 33 (4).* Retrieved 13 August 2017 from http://dsq-sds.org/article/view/3871/3411

Heylighen, A., der Linden, V. V., & Steenwinkel, I. V. (2017). Ten questions concerning inclusive design of the built environment. *Building and Environment, 114*, 507.

Inclusive Design Toolkit. University of Cambridge. Retrieved August 11, 2017, from http://www.inclusivedesigntoolkit.com/

ISO: ISO/IEC Guide 71:2014. Guide for addressing accessibility in standards (2014).

Iwasaki, Y. and Mactavish, J.B. (2005). Ubiquitos Yet Unique: Perspectives of People With Disabilities on Stress. *Rehabilitation Counseling Bulletin, 48 (4),* 194-208.

Kadir, S., & Jamaludin, M. (2012). Users' satisfaction and perception on accessibility of public building in Putrajaya: access audit study," *Procedia – Social and Behavioral Sciences, 50,* 429-441.

Levine,D. (2003). *Universal design Newyork2.* Center for Inclusive Design & Environmental Access, University of Buffalo, The State University of New York.

Mace, R. (1985). Universal design: barrier-free environments for everyone. *Designer's West, 33 (1),* 147-152.

Mace, R.L., Hardie, G.J., Place, J.P. (1996). *Accessible environments: toward universal design. North Carolina state university: the center for universal design*. Retrieved 10 August 2017 from http://www.ncsu.edu/ncsu/design/cud/pubs_p/pud.htm

Michigan Department of Natural Resources. (2013). *Making Michigan's outdoors more accessible.* Retrieved on 23 October 217 from http://www.michigan.gov/dnr/0,4570,7-153-10366_41825-317621--,00.html

National Association of State Par Directors. (2017). Retrieved on 4 April 2018 from https://www.stateparks.org/about-us/state-park-facts/

Nosek, M.A., Foley, C.C., Hughes, R.B. and Howland, C.A. (2001). Vulnerabilities for Abuse Among Women with Disabilities. *Sexuality and Disability, 19 (3),* 177-189.

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

Ostroff, E., (2001). Universal design: The new paradigm. In W. F. E. Preiser & E. Ostroff (Eds.), *Universal design handbook* (pp. 1.3–1.11). New York: McGraw-Hill.

Persson, H., Åhman, H., Arvei, A., Gulliksen, J. (2015). Universal design, inclusive design, accessible design, design for all: different concepts-one goal? On the concept of accessibility-historical, methodological and philosophical aspects. *Universal Access in the Information Society, 14* ***(4)***, 505–526.

Pike, H., Walker, J., Collins, J., & Hodges, J. (2008). An investigation of ADA compliance of aquatic facilities in the north texas area. *American Journal of Health Promotion, 23*(2), 139-146.

Pirkl, J. (1991). Transgenerational design: a design strategy whose time has arrived. *Design Management Journal, 2(4),* 55–60.

Richardson, C.A., & Rabiee, F. (2001). 'A question of access' – an exploration of the factors influencing the health of young males aged 15–19 living in Corby and their use of health care services. *Health Education Journal, 60,* 3–6.

Simonson, S. (2012). Measuring perceived accessibility of students with disabilities at a Public university (Master's Thesis). Colorado State University, Fort Collins, Colorado.

Socialdepartementet: Från patient till medborgare: En nationell handlingsplan för handikappolitiken. vol Prop. 1999/2000:79. Socialdepartementet, Stockholm (2000). Accessed 18 July 2017.

Steinfeld, E., Maisel, J., & Levine, D. (2012). *Universal design: creating inclusive environments.*

Story, F. (1998). Maximizing usability: the principles of universal design. *Assistive Technology 10 (1),* 4–12.

Thapar, N., Warner, G., Drainoni, M.L., William, S.R., Ditchfield, H., Wierbicky, J. and Nesathurai, S. (2004). A Pilot Study of Functional Access to Public Buildings and Facilities for Persons with Impairments. *Disability and Rehabilitation, 26 (5),* 280- 289.

The Center for Universal Design: Environments and products for people. (2008). Universal design history. Raleigh: North Carolina State University. Retrieved 18 July 2017 from https://projects.ncsu.edu/ncsu/design/cud/about_ud/udhistory.htm

The Michigan State Parks and Outdoor Recreation Blue Ribbon Panel. (2012). The future of Michigan's parks and outdoor recreation: a report to governor rick Snyder. Retrieved on 23 October 2017 from http://www.michigan.gov/documents/snyder/ParksPanelFinal_401824_7.pdf

Thomas, L., MacMillan, J., McColl, E., Hale, C., & Bond, S. (1995). Comparison of focus group and individual interview methodology in examining patient satisfaction with nursing care. *Social Sciences in Health*. *1*, 206–219.

U.S. Department of Justice (US-DOJ). (2009). *A guide to disability rights laws*. Retrieved on 23 October from https://www.ada.gov/cguide.htm#anchor66055

Vanderheiden, G. C. (2009). Accessible and Usable Design of Information and Communication Technologies. *The Universal Access Handbook.* Boca Raton, Florida: CRC Press.

Vanderheiden, G.C. (1996). *Universal Design: What it is and what it isn't.* Madison, WI: University of Wisconsin-Madison, Trace Research and Development Center.

Willis, D. (1990). Towards an architecture of responsibility. *Journal of Architecture and Planning Research, 8,* 15–22.

World Health Organization. (2011). *Global health and aging, 2011*. Retrieved from http://www.who.int/ageing/publications/global_health.pdf