

COMPLIANT VS CONVENIENT:
IS THE KANSAS STATE UNIVERSITY CAMPUS TRULY USER-FRIENDLY FOR
PERSONS WITH A PHYSICAL DISABILITY?

by

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A THESIS

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Abstract

The purpose of this thesis is to discover whether disability access regulations are being met and whether the regulations fulfill their intended purpose. Is Kansas State University Campus in Manhattan, Kansas ADA compliant (follows the current law) and convenient (user-friendly)? This inquiry can be split into two research questions: (1) Do the main entrances (entry experience being the sidewalk, ramp, and door) to buildings on the Kansas State University campus comply with current ADA guidelines? (2) Do students on campus find the access to these buildings user-friendly? This study has two main questions, and therefore multiple research methodologies: a focus group, audit, and guided activity. The focus group was made up of physically disabled students at KSU who are therefore familiar with access on the campus. The second method involved a yes-no checklist to test whether the buildings meet code. The third involved disabled and non-disabled students using a wheelchair for a day, with post-event survey to test public opinion of access on campus. My hypothesis anticipated that Kansas State University is code compliant, but not user-friendly. The conclusion is that no structure is fully sidewalk/ramp/door compliant, but two structures' doors are fully compliant. According to the audit: ramps are mostly not needed (only 35 percent of structures need a ramp), sidewalks are 66 percent compliant, and doors are 63 percent compliant. According to the survey: doors are in the best condition, with ramps next, and sidewalks last. When comparing the checklist (compliance) and survey (convenience) results, sidewalk results were different, the ramp results were non-conclusive, and the door results were similar. This means that sidewalks meet code, but people do not find them accessible. Because ramps are not always needed, it made the checklist and survey difficult to compare. The analysis did not result in a clear "Similar" or "Different" result, therefore the comparison was non-conclusive. Doors were in the best condition on the checklist, and most people felt they were in good conditions. The application of this project allows other universities and communities to test whether their structures adequately provide access to students with a disability in a way that is user-friendly.

Keywords: Disability Access, Code Compliant vs. User-friendly, Kansas State University

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List of Abbreviations

ABA=Architectural Barriers Act

ADA= Americans with Disabilities Act

ADAAG= Americans with Disabilities Act Accessibility Guidelines

ADRC= Aging and Disability Resource Center

ANSI= Americans National Standards Institute

APWA=American Public Works Association

BOCA=Building Officials and Code Administrators International, Inc.

DOJ=Department of Justice

DOT=Department of Transportation

DRC= The Disability Rights Center of Kansas

DSS= Disability Support Services

FHWA=Federal Highway Administration

IBC=International Building Code

KCDC= Kansas Commission on Disability Concerns

KSU= K-state/ Kansas State University

MGRAD=Minimum Guidelines and Requirements for Accessible Design

NCSBS= National Conference for States on Building Codes and Standards

OCE=Office of Compliance and Enforcement

SAC= Student Access Center

SBC= Standard Building Code

UBC= Uniform Building Code

UFAS= Uniform Federal Accessibility Standards

Nomenclature

Access Board = Name for the U.S. Architectural and Transportation Barriers Compliance Board

Architectural Barriers Act (ABA) = published 1968; insures access to buildings built with federal money; comprised of Cabinet-level officials of eight Federal agencies (Access Board)

Americans with Disabilities Act (ADA) = extends civil rights guarantees to 43 million Americans with disabilities and help eliminate discriminatory barriers in employment, public services, transportation, public accommodations, and telecommunications(Access Board)

Americans with Disabilities Act Accessibility Guidelines (ADAAG) = Guidelines created from ADA (Access Board)

Aging and Disability Resource Center (ADRC) = Effective November 1, 2012, is “designed to empower older adults and persons with disabilities to make informed choices about their services and supports. This will streamline access to those services and ensure their individual needs will be met. The ADRC can refer individuals to an array of in-home, community-based and institutional services, as well as provide decision-making support through a service called Options Counseling.” (Kansas.gov-KDADS, 2013).

American Public Works Association (APWA) = “The American Public Works Association exists to develop and support the people, agencies, and organizations that plan, build, maintain, and improve our communities. Working together, APWA and its membership contribute to a higher and sustainable quality of life.” (American Public Works Association)

Department of Justice (DOJ) = responsibility of rulemaking authority and enforcement (Access Board)

Department of Transportation (DOT) = designated to implement compliance procedures relating to transportation (Access Board)

The Disability Rights Center of Kansas (DRC) = Formerly Kansas Advocacy & Protective Services (KAPS), is a 501(c)(3) public interest legal advocacy agency empowered by federal law to advocate for the civil and legal rights of Kansans with disabilities. DRC is designated by the State of Kansas the official Protection and Advocacy System for Kansas. As such, DRC advocates for the rights of Kansans with disabilities under state or federal laws (ADA, the Rehabilitation Act, Federal Medicaid Act, Kansas Act Against Discrimination, etc.)” (DRC, 2011).

Disability Support Services (DSS) = now known as Student Access Center, as of Aug 2013. (Kansas State University)

Entry Sequence= for the purposes of this study it means the sidewalk, ramp, and door. (Klingler)

Federal Register = A daily publication of the US federal government that issues proposed and final administrative regulations of federal agencies

Federal Highway Administration (FHWA) = FHWA Office of Civil Rights oversees the DOT mandate (Access Board)

Handicapped Access = for the purpose of this study it is any door with Handicapped Accessible decal. If multiple, then whatever door was closest to heart of campus (Klingler)

Kansas Commission on Disability Concerns (KCDC) = “provide disability-related information to the people of Kansas. Many of the key resources people access [...] such as Disability Service Maps, Resources, ADA Information, Legislative Information and more. In addition, [the KCDC offers] lots of information on topics to assist people with disabilities in living as equal citizens. (Kansas Office of the Governor-KCDC, 2013)

Main Entrance= for the purpose of this study it is the door closest to location of the building name sign. If multiple, then whatever door most students seemed to be using (Klingler)

Minimum Guidelines and Requirements for Accessible Design (MGRAD) = covers transit vehicles and stations, including additional requirements for public accommodations, and work with the Attorney General to develop a technical assistance plan for the [ADA] act (Access Board)

Non- ambulatory Disabilities= physical impairments that, regardless of cause, confine persons to wheelchair mobility (Colter)

Office of Compliance and Enforcement (OCE) = investigates complaints filed under the ABA (Access Board)

Recreation Access Advisory Committee = A new approach to fact-gathering in the early stages of the rulemaking process; Members reflect the diverse issues and interest to be explored in rulemaking for recreation facilities (Access Board)

Student Access Center (SAC) = formally known as the Disability Support Service; provides support for KSU students (Kansas State University)

Semi-ambulatory Disability= physical impairments that cause a person to walk with insecurity or difficulty; crutches, walkers, braces (Colter)

Uniform Building Code (UBC) = requires accessibility for the physically handicapped at one primary entrance (Access Board)

Uniform Federal Accessibility Standards (UFAS) = published in 1984; standard used to enforce ABA; based on MGRAD (Access Board)

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Dedication/Preface

I would like to dedicate this research to the lady who inspired this project, Kelly Marie Goff. You are an amazing friend. Love you always. Rest in Peace.

*“My **good friend** growing up had a **physical disability**, she was in a wheelchair. Growing up with her I noticed how **inconvenient** it was to get around.*

*While walking around the **Kansas State University Campus** it appears to me that **ramps are located in odd locations and are not well kept.**”*



Chapter 1 - Introduction

Significance of Study

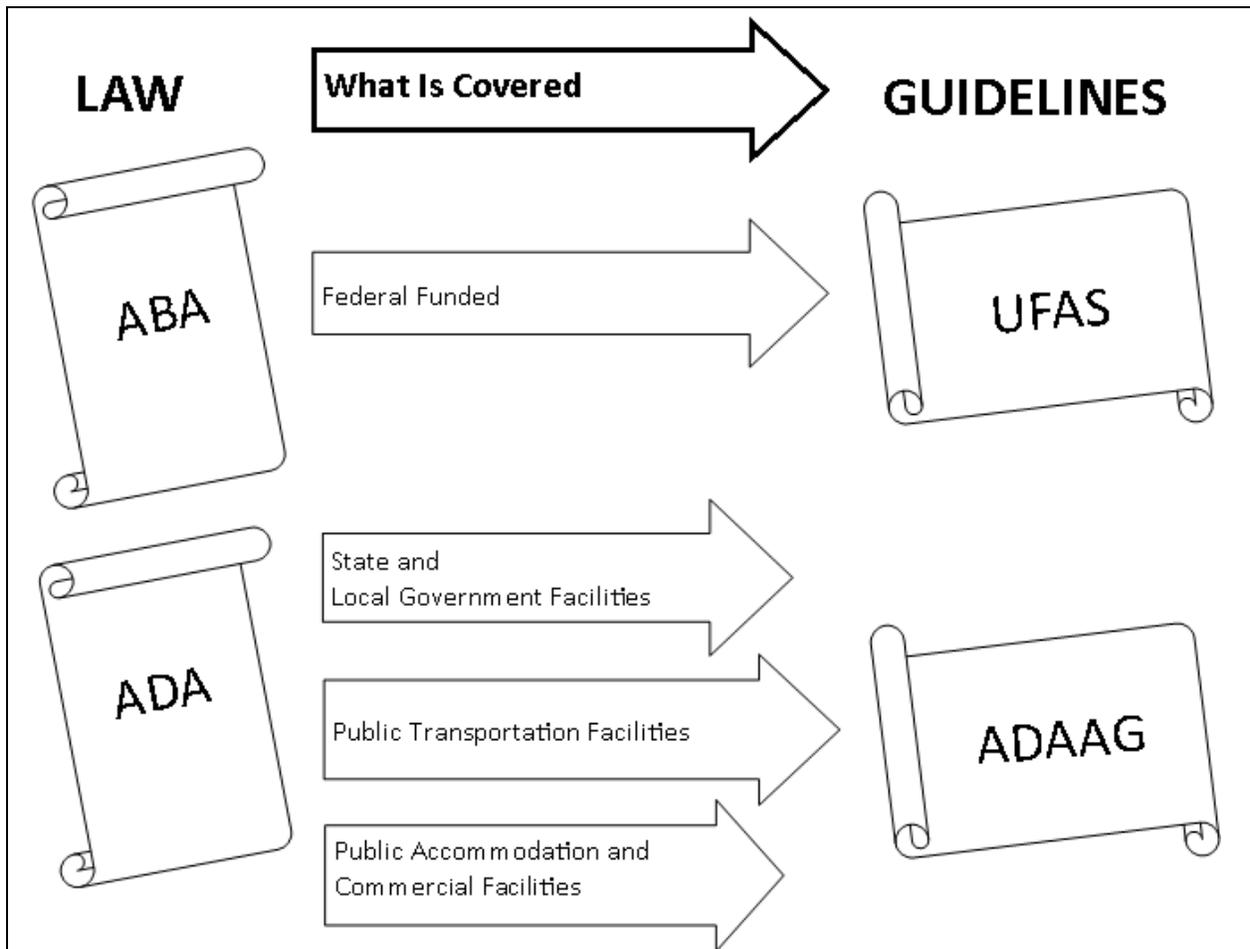
Access for All: It is important that all people have access to higher education. Anyone can become disabled at any time. “We are never prepared to become disabled. Until it does happen, most of us rarely even consider the possibility. We are all vulnerable, however, and when disability strikes, life can feel as if it has turned upside-down” (Tholen, 2008, p.2). Buildings should be accessible to all that need to use them. This concept relates to planners advocating for social justice, access for all.

Policies in Practice: In a simple form, this study tests whether Americans with Disabilities Act (ADA) policies are working as intended. Planners make policies to help guide designers. Are the developers, designers, engineers, etc. following the policies? Do the policies actually meet the purpose of their creation when put into practice? This relates to the restrictions planners have on development. These restrictions range from city codes to specific district guidelines. Planners are tasked with the job of enforcing these restrictions. Even if a developer follows every line of the code, is the issue of concern, or reason the code was created, really being addressed? Planners need to test these policies in practice to find what guidelines need to be reworded.

A Prevue to ADA

The Architectural Barriers Act (ABA), published 1968, initiated the idea of making structures accessible by all people. The Americans with Disabilities Act (ADA) was passed into law in 1990. This extended and simplified the previous laws on making all buildings accessible to persons with disabilities. The ABA and ADA are laws, while the documents that state all of the regulations are the Uniform Federal Accessibility Standards (UFAS) and the Americans with Disabilities Act Accessibility Guidelines (ADAAG). See Figure 1.1 for clarification. The ADAAG are the minimum standards related to the ADA act that all builders and developers must legally comply.

Figure 1.1: Relating Disability Access Law to Guidelines



(Diagram from Access, 1998; recreated by Klingler 2012)

Focus

I am analyzing if the entry sequence of buildings on Kansas State University Campus meets ADAAG regulations for wheelchair access.

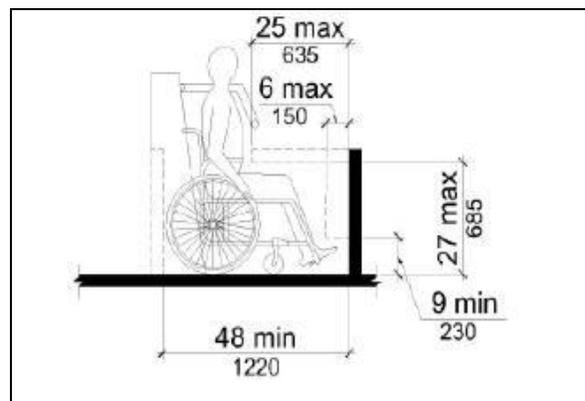
Why Kansas State University: For the purpose of this study I wanted to do something hands-on, so I opted to stay in Manhattan, Kansas and focus on my university. Manhattan is located in the north-east portion of Kansas as shown in Figure 1.2.

Figure 1.2: Location of Manhattan, Kansas



(ePodunk Inc., 2007)

Figure 1.3: Wheelchair Measurements

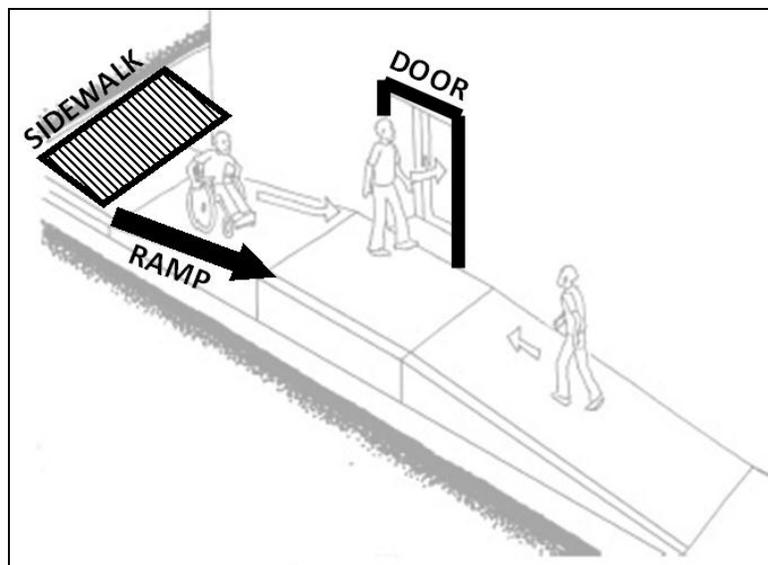


(ADA Accessibility Guidelines, 2002)

Why Wheelchairs: Although disabilities can include mental problems, such as dyslexia or Attention Deficit Hyperactivity Disorder (ADHA), I chose to focus on physical disabilities because site planning would require a physical analysis. While physical disabilities have a wide range including being deaf or blind, leg issues (needing crutches or a wheelchair) is the easiest to simulate. In order to get public involvement, and simulate a disability, this study centers on wheelchair access. For some quick reference measurements on standard wheelchairs, see Figure 1.3, more detail about wheelchairs can be found in Appendix-A.

Why the Entry Sequence: After doing some initial research on disability regulations I found there were too many regulations to consider for the scope of this study. Since the goal is to simplify my scale of analysis and maintain a planning perspective, I decided to focus on the connections between structures. The main emphasis of my analysis is therefore on the entry sequence, which includes the sidewalk, ramp, and door/entrance of each structure, as shown in Figure 1.4. It is important to note that it does not matter if the interior of the building is accessible if you cannot even get inside.

Figure 1.4: Entry Sequence



(Image from U.S. Dept. of Transportation Federal Highway Administration; altered by Klingler 2014)

Why ADAAG: After analyzing disability regulations about the entry sequence, it was determined that the Americans with Disabilities Act Accessibility Guidelines (ADAAG) is the strictest on the components of the entry sequence. Kansas State University (KSU) Facilities Department completed an audit in 1992 in compliance with ADA regulations. KSU Facilities Department chose to comply with ADAAG instead of UFAS. It is because of these components I decided to focus on ADA compliance instead of another disability access regulation.

Chapter 2 - History and Context

Introduction to Jurisdiction

While researching disability access regulations, it is important to understand the history, regulations, and organizations at different scales. In the United States, disability access has been a concern since the middle of the twentieth century but access standards were not legislated until 1991 in the Americans with Disability Act (ADA). Kansas developed a checklist for developers shortly after that to create a simple way to ensure compliance with the guidelines.

United States of America

Disability access was not a topic of concern until 1961. It was not until 1990 however, that the American's with Disability Act (ADA) was passed. The ADA mandates that buildings must be accessible to people with physical disabilities. The Americans with Disabilities Act Accessibility Guidelines (ADAAG) was codified to enforce the ADA. The ADA has been updated multiple times with the most recent update being 2010. Any building being constructed must comply with the most recent version of the ADAAG.

Disability Access: The battle against disability discrimination started with the Americans National Standards Institute (ANSI) that was adopted in 1961, and later revised in 1980 and 1986, as shown in Table 2.1. In 1973, congress created the Architecture and Transportation Barriers Compliance Board (Access Board) to implement the Architectural Barriers Act (ABA) that was published in 1968. In 1982, the Access Board published the Minimum Guidelines and Requirements for Accessible Design. In 1984, the Uniform Federal Accessibility Standards (UFAS) were adopted. In 1989 the Americans with Disability Act (ADA) was endorsed by President Bush and passed by the Senate, then passed by Congress in 1990. In 1991, the Americans with Disabilities Act Accessibility Guidelines (ADAAG) was codified to enforce the ADA. The ABA and ADA design guidelines are then combined in 2004. In 2008, the ADA was revised, and became effective in 2009.

“The ADA was originally enacted in public law format and later rearranged and published in the United States Code. On Friday, July 23, 2010, Attorney General Eric Holder signed final regulations revising the Department's ADA regulations, including its

ADA Standards for Accessible Design. The official text was published in the Federal Register on September 15, 2010 [...] Compliance with the 2010 Standards for Accessible Design is permitted as of September 15, 2010, but not required until March 15, 2012.” (ADA.gov, 2013, para. 1 and 4).

Table 2.1: Timeline of Important Dates

Timeline of Important Dates	
1961	Americans National Standards Institute (ANSI) established
1968	Architectural Barriers Act (ABA) published
1973	Congress creates the Architecture and Transportation Barriers Compliance Board (Access Board) to enforce the ABA
1974	The Board meets for the first time; Congress adds a ninth Federal agency to the Board
1978	Congress requires the Board to develop minimum accessibility guidelines; adds a tenth Federal agency to the Board, and expands the Board to include 11 public members (five must be disabled) who are appointed by the President
1980	Americans National Standards Institute (ANSI) revised
1982	The Access Board publishes the Minimum Guidelines and Requirements for Accessible Design (MGRAD)
1984	The Uniform Federal Accessibility Standards (UFAS) were adopted by the four standard-setting agencies (Department of Defense, Housing and Urban Development, Postal Service, and General Services Administrations)
1986	Americans National Standards Institute (ANSI) revised
September 7, 1989	American’s with Disabilities Act (ADA), endorsed by President Bush, passed by Senate
1990	American’s with Disabilities Act (ADA) passed by Congress
	Under the Omnibus Budget Reconciliation Act, small businesses are eligible for tax credits if they comply with ADA
1991	The Access Board publishes the ADA Accessibility Guidelines for Buildings and Facilities, ADA Accessibility Guidelines for Transportation Facilities, and ADA Accessibility Guidelines for Transportation Vehicles
July 1, 1991	The Access Board published the ADA Accessibility Guidelines (ADAAG)
January 26, 1992	Title III: Public Accommodations (of ADA) becomes effective
1993	The Board forms the Recreation Access Advisory Committee
1994	DOJ publishes update to ADAAG
1995	Washington State Building Code Council is the first to create a certified building code that complies with Title III of the Americans with Disabilities Act
July 23, 2004	US Access Board published new design guidelines by jointly updating the ABA and ADA guidelines

The Americans with Disability Act focuses on nondiscrimination for those with a disability. Each title focuses on a different situation.

“The Americans with Disability Act, ADA, P.L. 101-336, has often been described as the most sweeping nondiscrimination legislation since the Civil Rights Act of 1964. It provides broad nondiscrimination protection for individuals with disabilities in employment, public service, public accommodation and services operated by private entities, transportation, and telecommunications. As stated in the Act, its purpose is ‘to provide a clear and comprehensive national mandate for the elimination of discrimination against individuals with disabilities.’” (Jones, 2003, p. 41-42).

Title I details employment rights: nondiscrimination on the basis of disability in regard to job application procedures, the hiring, advancement, or discharge of employees, employee compensation, job training, and other terms, conditions, and privileges of employment. Title II focuses on public services: nondiscrimination on the basis of disability in state and local government services. This is considered the heart of ADA because it mandates reasonable accommodation. Title III focuses on public accommodations and services operated by private entities: nondiscrimination on the basis of disability in public accommodations and commercial facilities.

A structure does not need to be changed to comply with the updated codes unless new construction or renovation occurs (Rhoads, 2010). According to the U.S. Architectural Transportation Barriers Compliance Board, “[t]he UFAS requires compliance once an addition is constructed. If the addition itself does not have an accessible entrance, then one must be provided in the existing building, with an accessible route to the addition.” (U. S. Access Board: Technical Paper, 1989, p.41). The ADAAG are rules for the construction of buildings to make them accessible to a wider variety of people. However, because the ADAAG applies to buildings at the time of construction, or remodel, it does not ensure all buildings are accessible.

State of Kansas

The United States first addressed disability access in 1961, but it was not until 1990 that the American's with Disability Act (ADA) was created. In 1991 the American's with Disability Act Accessibility Guidelines (ADAAG) were complete. Developers found these new regulations difficult, so in 1993 the state of Kansas created a checklist to help Kansas developers meet regulations. I used this checklist to develop my audit to access the compliance of buildings on campus. In order to create a simple way for Kansas residents to check their structure against ADAAG regulations, the official *Kansas ADAAG Checklist* was created. This document is a comprehensive checklist for businesses and developers to use to make sure their facilities meet the United States ADAAG regulations. The checklist is a list of components of the building to observe and then provides a reference to the specific ADAAG code (Department of Facility Management, 1993). The state of Kansas created the checklist, but does not have any additional regulations about disability access.

Kansas State University Campus

The City of Manhattan has zoned Kansas State University (KSU) as U-university allowing KSU to make its own rules about disability access. In 1978, a design study was conducted to analyze disability access. However, the focus of the study was only Dickens Hall and a full audit of all campus did not come until 1992. The 1992 audit was done by KSU Campus Planning and Facilities Management. No extensive audit has been done since then. Campus Planning and Facilities Management is in charge of new building development and maintenance of current building infrastructure. They decide what to approve based on the KSU Master Plan. The 2050 Master Plan is a combination of goals to guide development for the future of KSU. This plan, however, does not include any goals on disability access. There are two advocacy groups on campus that could potentially affect policy. The president has committees to help make decisions such as The Advisory Committee for Universal Design and Accessibility whose charge is to specifically focus on disability access. The Student Access Center provides assistance to disabled students on campus by offering resources including access to information, busing system, testing facilities, and tutoring. The center also provides information about the two student organizations specifically used by students with disabilities.

Zoning: The City of Manhattan zones Kansas State University (KSU) as U-university. The City of Manhattan does not have any disability access regulations for the U zone. According to the city ordinance U zoning gives the regulation power to KSU. Kansas State University Campus has completed only minimal actions related to disability access. Kansas State University is zoned as U-university in the City of Manhattan, Kansas Zoning District Map (City of Manhattan, 2011). “The University District is designed to permit the establishment of uses normally associated with a [u]niversity, or other educational institution, and to give and to allow more flexibility than other districts normally have , while providing a landscaped buffer from adjoining zoning districts and public streets.” (City of Manhattan, 2013, p. III-2). There are no specific restrictions or regulations associated with the Americans with Disability Act for the U district in the Manhattan Zoning Regulations.

Design Study: In 1978, a design team undertook a project called *Adapting Historic Campus Structures for Accessibility*. The focus at Kansas State University was on Dickens Hall. “Dickens hall was designed in the Romanesque style and was built in 1907” (Milner, 1978, p. 50). This design study focused on site access, accessible entrance, vertical access, horizontal access, toilet room, drinking fountains, signage, special spaces, and additional program concepts of Dickens Hall. This is one of the first documented design studies of access at Kansas State University.

Campus Planning and Facilities Management: The Kansas State University Campus Planning & Facilities Management Department has campus design rules for any development on campus. Both chapter 4 (Exterior Closure) and chapter 10 (Site Work) of the *2013 Design and Construction Administration Specification Standards* contain rules that have to do with the entry sequence. Section 4.3-Penetrations includes Doors and Frames (4.3.1), Door Hardware (4.3.2), and Power Operated Doors (4.3.3). Section 10.3 focuses on Sidewalks and Ramps. (KSU-construction projects, 2013). Any new construction is checked against these regulations. According to the Associate Director of Campus Planning and Facilities Management, Mark Taussig, the 1992 ADAAG audit was the first check of whether campus was accessible for persons with a disability. The facilities department has not undertaken another campus-wide analysis since (Taussig, 2013).

2050 Master Plan: One of the Guiding Principles of the *2050 Master Plan* is “design for a pedestrian oriented campus”. This is the only principle that is related to human access while on campus. There is no direct reference to disability access in the Master Plan (Kansas State University, 2013).

Advisory Committee for Universal Design and Accessibility: Kansas State University has about 35 presidential committees and councils. The Advisory Committee for Universal Design and Accessibility, a mixture of campus personal, professional planners, and student representations. This council studies and recommends utilization of resources and development of procedures to facilitate the needed programs for accommodation of disabled persons and reports to the Provost. (KSU: Office of Academic Personnel, 2013, para. 53).

Student Access Center: The Student Access Center, previously known as the Disability Support Services, is an organization for students with disabilities to receive support with campus issues, such as access to buildings or assistance with homework.

“Kansas State University is dedicated to providing equal opportunity and access for every student. The staff...provides a broad range of supportive services in an effort to ensure that the individual needs of each student are met. In addition, the staff functions as an advocate for students with disabilities on the K-State campus.”(KSU: Student Access Center, 2013, para. 1).

Between March 2013 and March 2014, the Student Access Center increased their service from 500 students to over 600 students. According to the Student Access Center faculty and staff information, as of March 2014, only 5 percent of students receiving services have a visible disability (low vision, deaf, or physical), while ninety-five percent of students have non-visible disabilities (learning disabilities, ADHD, psychological, or traumatic brain injury) (KSU: Faculty/Staff Information, 2013-2014).

Student Organizations: Kansas State University offers two dedicated organizations for students with disabilities- emPower Cats and Alpha Pi. “emPower Cats is a Kansas State University student organization comprised of students with disabilities and their advocates. Delta Alpha Pi: Academic Honor Society was chartered in 2009 by students with disabilities. The Alpha Kappa Chapter at KSU was established to recognize and commend the

accomplishments of eligible students.” (KSU: Student Organizations, 2013). These groups provide an opportunity for students to mingle with others with similar situations. They also provide a positive environment for students to mature in their academic achievements.

Kansas State University is slowly accepting students with disabilities. Even though the Americans with Disabilities Act Accessibility Guidelines (ADAAG) was fashioned in 1991, the campus audit was done in 1992 and the student organizations were shaped in 2009. Progress is slowly being made, but no one is testing whether the ADAAG are even working. The time is ripe for another assessment of accessibility on campus. In more than twenty years since the previous audit buildings have been remodeled. In addition, there is growing recognition of the need to address universal accessibility. In this thesis I take a first step in that direction by conducting an assessment of the accessibility of entrances to academic buildings on campus.

Chapter 3 - Theory and Literature

Planning Theory

Defining Planning

Planning is a relatively new profession still trying to define exactly what it is planners do. Planners are trying to define their place in the world by generating a comprehensive list of issues they address. According to “Anchor Points for Planning’s Identification” written by Dowell, planning focuses on improving human settlements, interconnections, future, diversity of needs, open participation, and linking knowledge and collective action (Dowell, 1997). The article received many responses via commentaries. The Planning, Theory, Ethics, and Practice class at Kansas State University continued this discussion by trying to define planning in their own words (Brody, 2014). The class tried to determine whether planners are consultants, experts, or advocates. The conversation expanded to ask who planners are accountable to. Should planners listen to city staff, the public opinion, or academic researchers? Planning is still a new profession trying to find its need and place in society.

Creating Plans

Planners currently use many tactics to make things happen. The most common tools are regulations and plans. Regulations give the power to the planner, while plans are the grand idea. According to chapter two of Hopkin’s *Urban Development: The Logic of Making Plans*, plans can be made when the Four “I”s apply to a situation (Hopkins, 2001). The Four “I”s are: interdependent, indivisible, irreversible, and imperfect foresight. “Interdependent” is when an issue is the result of another decision. Disability access is dependent on building designs. “Indivisible” is when the size of action affects the value. The width of the sidewalks needs to be large enough for wheelchairs to pass each other. “Irreversible” is when you cannot return to the previous state. Once a ramp is built it is irreversible, it cannot be relocated without a significant cost. “Imperfect foresight” is when more than one future is possible. The number of disabled students on campus may increase or decrease depending on demand. Population projections can be done to get an idea, but planners do not know for certain what is to come. Thus, disability access is a situation when plans can be implemented.

The Four “I”s determine when to use a plan, but what are the components of a plan? Hopkins answers this in chapter 3, “How Plans Work” (Hopkins, 2001). As defined by Hopkins, the components of plans are: vision, policy, agenda, strategy, and design. The vision is the image of what could be in the future. In this case, it is the idea of having access for anyone with a disability. The policy is the rules for action. The American’s with Disabilities Act is the law, or rule, that was put into place to make this vision happen. The agenda is a list of things to do. The American’s with Disabilities Act Accessibility Guidelines were created as a step by step how-to guide. The strategy is described as contingent actions. This is the designer’s method for coming up with a building that meets code. The design is defined as the fully worked out outcome. This is the final building plans for a site. In summary, disability access follows the template for the components of a plan. Planners have a say at every point in this process. Planners are always testing whether their plans are working and getting results. Implementing and checking disability access should not be any different.

Collective Good

Planners make plans for several reasons, one of which is to provide for the public interest. The American Planning Association (APA) encourages planning that contributes to the public well-being by developing communities that fulfill the needs of people and society. The Code of Ethics and Professional Conduct states that the APA’s primary obligation is to serve the public interest (APA’s Chief Executive Officer, 2013). Brookes discusses this idea in *Planning Theory for Practitioners* by arguing Klosterman’s four “vital social function” that are performed by public planning (Brookes, 2002). According to Brookes, planning in the public sector is done to: one-create data, two-promote the collective good, three-remedy negative effects, and four-resolve inequalities. This section explains collective good, while the social justice section examines the history behind resolving inequalities.

Collective good can be achieved, according to Hopkins, when consumption is non-rival and exclusion is infeasible (Hopkins, 2001). Rival means there is competition, while non-rival is when others can use it without affecting the quality for another. Exclusion is feasible when there is a private benefit, while infeasible means anyone can gain from the situation. A plan is truly a collective good then anyone can use it without depreciating the value for another person.

Disability access is a collective good, for example, anyone can use a ramp without depreciating the value for another person. Developers and designers, however, do not see disability access as a collective good. When a developer or designer is creating a space they will want to balance their private needs of making money with allowing access. Spending more money for an inclusive design would allow more access, but might also decrease profits. By reducing the competitive aspect of development, developers may be more likely make accessible designs.

Social Justice

As discussed by Brookes, planners provide for the collective good as well as resolve inequalities. Planners have dealt with inequality since the Civil Rights Era. June Thomas discusses social justice in “Social Justice as Responsible Practice: Influence of Race, Ethnicity, and the Civil Rights Era” (Sanyal et al., 2012). Thomas states that social justice was first accepted as a planning issue in the 1972, with the American Institute of Certified Planners’ (AICP’s) Code of Ethics. The concept of social justice started in the 1950s, however, with racial justice lead by Martin Luther King Jr. As the years passed, planner slowly accepted racial justice by discussing issues at planning conferences. Racial was the first topic, but focus soon changed to include ethnicity, class, gender, sexuality, and physical ability.

In 1998, *Cities of Difference* was published as a compellation of research and theory on these issues (Rincher et al, 1998). Brendan Gleeson explains in chapter five that disability is “something which is ‘made’ from the impaired body under specific historical circumstances” (page # needed). He states that the connection between a physically impaired body and the way we marginalize it is not a given relationship, but instead confined to a power framework.

This discussion of acceptance continues into this decade. Schildt argues that planners “need to reexamine those built-in assumptions and to speak up for inclusion” (Schildt, 2013, p. 52). Disability access is an issue planners should continue to address while seeking social justice.

Aging Population

Social justice is becoming an even bigger issue for planners as America is becoming more and more diverse. According to *Diversity and Aging in America: Shifting demographics provide a new opportunity for planning leadership*, published in the March 2013 addition of

APA Magazine, Myers states America is becoming more and more ethnically diverse (Myers, 2013). He goes on to create a “senior ratio” using census data. His findings state that America is not only getting more ethnically diverse, but the average age of citizens is also increasing. Hossian reiterates this finding by using a spatial analysis in the *America’s Aging Population* report published December of 2013 (Hossian, 2013).

Because physical disability is usually linked with age, as America continues to age, the concerns for disability access will also increase. The more disabled people there are, the higher the demand for compliance.

Communicative Planning

As the population continues to change, peoples’ needs will also change. The only way to truly understand the issues, concerns, and desires is to communicate with them. Healey explains communicative planning as being “well recognized in the planning field” (Sanyal et al., 2012, p. 333). Healey argues that communicative planning was tentatively developed in the 1980s, defined in the 1990s, and in the 2000s became a staple on reading lists for students in planning programs. The main focus of communicative planning is emphasizing the social interactions rather than assuming autonomous preference. Theorists share the concept of “knowledge formation as an active social and performative process of learning and discovering” (Sanyal et al., 2012, p. 337). This concept continues today in 2014 with articles in APA Magazine emphasizing the importance of engaging people to provide a critical voice in the rebuilding process.

This study addresses public participation by having disabled students converse with one another about their issues with access. This group discussion, or focus group, allows students to feed off of each other and gain perspective on what other students may also struggle with. This discussion allowed me to more fully understand the problems these students face on a daily basis. It is through communication I can gather the public perception of disability access.

Introduction to Literature and Regulations

The Americans with Disabilities Act Accessibility Guidelines (ADAAG) are not periodically tested, they are only investigated on a complaint bases. Therefore there are no studies on whether the ADAAG is convenient in practice. I could not find any literature on studies of compliance versus convenience for ADA on college campuses, especially at Kansas State University (KSU). The audit done by facilities in 1992 of KSU is the only attempt at testing compliance, but convenience has not yet been tested. *Architectural Accessibility for the Disabled of College Campuses* is the only document that is directly tied to college campuses. However, this book is not a study, but instead focuses on specific criteria formatted similarly to the ADAAG (Cotler, 1976). Because I could not find any previous studies, I looked instead into what the specific laws and restrictions are in diverse documents. These documents cover multiple years, multiple locations, and multiple scales. As time passes, rules change. Rules are also different throughout the United States (by state, and sub-state jurisdictions) and throughout the world.

Comparable Analysis

The current research being done pertaining to disability access usually focuses on Title I of the Americans with Disabilities Act (ADA). Title I looks at employment quality. My study focuses on the physical component of the ADA, which would fall under Title II-private services and III-public services. The Americans with Disability Act Accessibility Guidelines (ADAAG) are guidelines for developers to follow. I could not find any research of testing whether the ADAAG is working. When doing my research I compared disability access regulations in multiple documents. I also researched who is held accountable for meeting compliance. The following six documents are summarized in Table 3.1.

The document *Architectural Accessibility for the Disabled of College Campuses* was written in 1976, fourteen years before the ADA was enacted. By combining first-hand observations from their own physical handicap with a professional interest obtained from graduate degrees and administrative experience in educational administration, the authors created a list of guidelines. The regulations discussed are very similar to the ADAAG.

According to the *Laws Concerning the Access Board* (1994), the U.S. Architectural and Transportation Barriers Compliance Board, also known as the Access Board, is responsible for developing accessibility guidelines for entities covered by the Act and for providing technical assistance to individuals and organizations on the removal of architectural, transportation, and communication barriers. The agency's mission is to enhance the quality of life by ensuring accessibility and broadening public awareness that access makes economic and practical sense for all.

The Access Board wrote the *Technical Paper on Accessibility Codes and Standards* in 1989 by combining information from many texts into one comprehensive document. The document compares USA regulations to foreign standards. In general, the USA is more specific lax compared to other developed countries.

The *Americans with Disability Act Accessibility Guidelines for Buildings and Facilities* was first published in 1991, this addition is the 1998 update to the guidelines. It tracts edits of what was changed. The Access Board was responsible for developing these guidelines for the design of buildings and facilities so that they are accessible to and usable by people with disabilities.

In 1993, Kansas created the *Americans with Disability Act Accessibility Guidelines Checklist* to assist the developers in Kansas meet the USA ADAAG. This checklist is a tool to survey existing buildings and identify those features or elements in need of modification.

The *Accessible Rights-of-Way Design Guide* was developed by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board), U.S. Department of Transportation (DOT), and Federal Highway Administration (FHWA) in 1999. It was created to assist public works and transportation agencies covered by Title II of the ADA in designing public pedestrian circulation networks.

Table 3.1: Comparable Analysis

Who Conducted Study/ Project	Area of Focus/ Title	Scale	Methods	Findings/ Conclusions
Cotler and DeGraff, 1976	Architectural Accessibility for the Disabled of College Campuses	General	First-hand observations	Rationale are indicated under each code to help explain the requirements
Access Board, 1989.	Technical Paper on Accessibility Codes and Standards: A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities	United States; International	A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities; MCRAD/UFAS Review Project	USA regulations are less strict than other developed countries.
Division of Facilities Management, 1993.	Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities	Kansas	Check list made from ADA requirements	This is a tool, this checklist can be used to survey existing buildings and identify the features or elements in need of modification
Access Board, 1994.	Laws Concerning the Access Board: Architectural Barriers Act of 1968 (ABA); Section 502 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990 (ADA)	United States	Ensuring accessibility. Broadening public awareness.	ADA expanded role of the Access Board. Access Board is responsible for developing guidelines and providing technical assistance on the removal of barriers; These laws form the basis for building an accessible environment for all people
Access Board, 1998.	Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)	United States	Regulatory Requirements for Accessible Buildings and Facilities	Edits and updates can be tracked
Access Board, 1999.	Accessible Rights-of-Way (Sidewalks, Street Crossings, Other Pedestrian Facilities): A Design Guide	United States	Public pedestrian circulation networks	Background and Standards of ADA. Creative Design Solutions to Rights-of-Way: Used for new design and alteration of existing facilities

Specific Guidelines

These specific guidelines were the result of trying to make buildings handicapped accessible. Although these guidelines were not explicitly written by planners, planners use guidelines to manage development and direct designers. Because of the focus on the entrance sequence, see Figure 1.4, I concentrated most of my attention on information about sidewalks, ramps, and doors/entrances. Also, since most restrictions are based around the standard wheelchair, see Figure 1.3, the regulations remain very similar between resources. The resources used are: *Architectural Accessibility for the Disabled of College Campuses, Technical Paper on Accessibility Codes and Standards, Americans with Disability Act Accessibility Guidelines Checklist, Americans with Disability Act Accessibility Guidelines for Buildings and Facilities,* and *Accessible Rights-of-Way Design Guide*. An example of a regulation is shown, but more specific numerical codes are discussed in detail in the Audit section.

Sidewalk

Each of the resources has a section about sidewalks or paths. Table C.1 shows what sections of the resource are applicable to sidewalks and paths. Sidewalks have restrictions on the size of grating openings. There are also rules on sidewalk width to allow enough room for wheelchairs to pass each other or turn around. An example of acceptable sidewalk width can be seen in Figure 3.1.

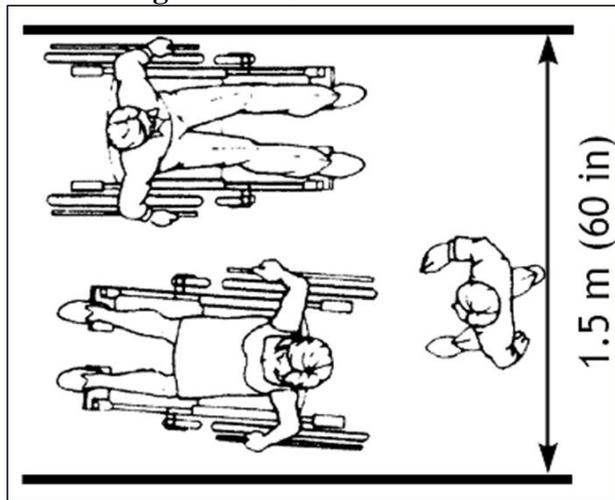
Ramp

Each of these resources has a section about ramp regulations. Table C.2 shows what sections of the resource are applicable to ramps. As an example, ramps need to have a small slope so wheelchairs can easily maneuver up and down them. An example of comparing envisioned slope and ADAAG approved slope can be seen in Figure 3.2.

Door/Entrance

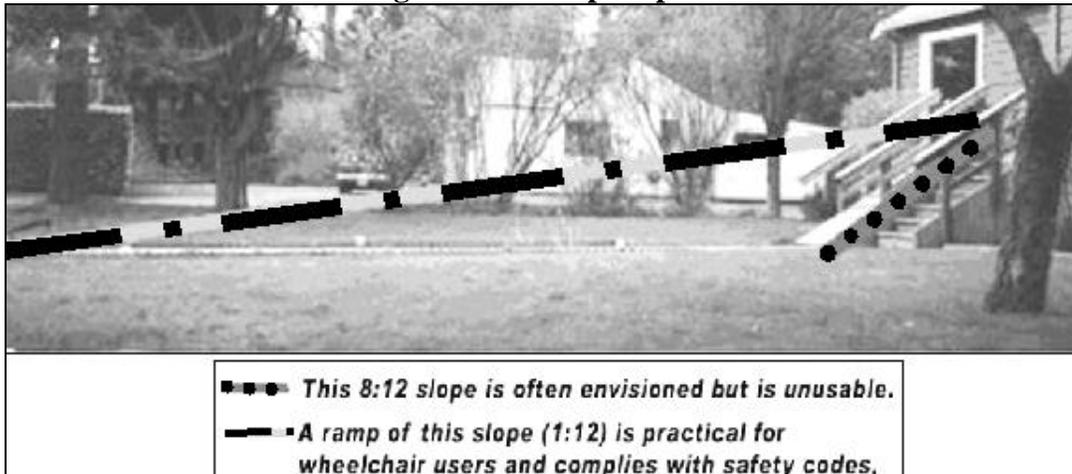
Each of these resources has a section about doors and/or entrances regulations. Tables C.3 and C.4 show what sections of the resource are applicable to doors and/or entrances. As an example, doors need to be opened by someone sitting. This means the door hardware, as well as door weight need to be used by someone seated in a wheelchair. A person in a wheelchair needs a sufficient amount of level open space to open a door, as noted in Figure 3.3.

Figure 3.1: Sidewalk Width



(U.S. Dept. of Transportation Federal Highway Administration, 2014)

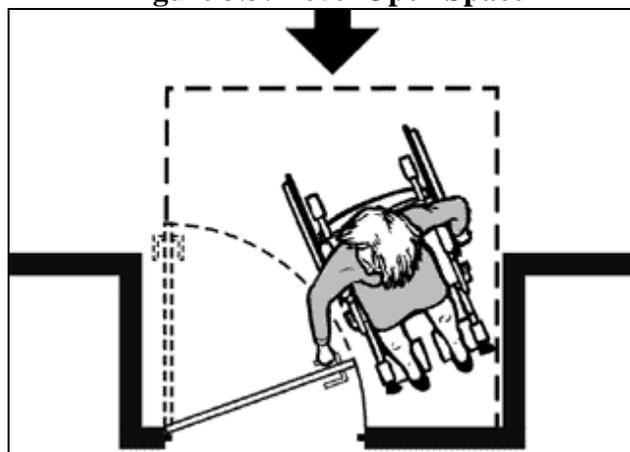
Figure 3.2: Ramp Slope



●—● This 8:12 slope is often envisioned but is unusable.
■—■ A ramp of this slope (1:12) is practical for wheelchair users and complies with safety codes.

(Ramp Arts, 2012)

Figure 3.3: Level Open Space



(U.S. Department of Justice-Civil Right Division, 2012)

Compare with Other Countries

As stated in the Context section, there are no regulations that extend globally. This section compares some countries in relationship to disability access. Table 3.2, from *Access Board* compares regulations in Australia, Belgium, Canada, France, Japan, South Africa, Sweden, and the United Kingdom related to the entry sequence. Table 3.2 is meant as a quick reference of trends found in the *Technical Paper on Accessibility Codes and Standards: A Comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities* written by the *Access Board*, therefore the table is not created from extended comprehensive research (Access Board, 1989).

All of the regulations are compared to the United States Uniform Federal Accessibility Standards (UFAS). Over all, ramps and sidewalks are wider in other countries, but ramps have smaller landings. Door openings are smaller (than the US) in France and Australia and doors also have a larger (than the US) threshold in Sweden.

Table 3.2: Comparing Regulations Throughout the World

	Ramps	Doors	Entrances	Sidewalks
Australia	wider at 1000m (915 UFAS)	19.5N to open, 6N to swing, 7.5N to hold open	smaller clearance opening	landings required for slope 1:33
Belgium	wider at 1200mm (915 UFAS) but landing is smaller at 1200mm (1525 UFAS)			must be rough surfaces
Canada	1500mm except with small gradient at 1:10 or 1:11	warning must be given for visually impaired of door opening area		Larger 920mm passing (915 UFAS)
France	1:20 only used for 15 meters; allows 1:6 (UFAS doesn't allow anything steeper than 1:8)	800mm (similar to UFAS 815mm)		
Japan	not steeper than 1:12; 2cm edge (UFAS requires 5cm edge)			
South Africa	1100mm minimum width; landings 1200mm x 1200mm If changing direction or 915mm wide X 1525mm long			
Sweden	shall not exceed 1:12 gradient nor 600mm length; entrance landing: gradient can not exceed 1:50 and requires 2000mm long x 1300 wide landings	25mm threshold (UFAS 13mm)		
United Kingdom	1200mm (915 UFAS); landings 1200mm x 1200mm (1525mm X 1525 UFAS)			1200mm (915 UFAS)

(Information from Access, 1998; created by Klingler 2012)

Chapter 4 - The Project

Problem Statement/ Research Questions/Hypothesis

Legally campus must be compliant with the ADAAG, but the federal Office of Compliance and Enforcement (OCE) only investigates complaints and does not regularly check compliance after a building has been built. This results in buildings that are not accessible because they have either fallen out of compliance with ADAAG over time. As KSU senior, Alison Olive said “Once you comply with ADA, it doesn’t mean you’re complying with my disability” (KSU: Student Access Center, 2014). Meeting the minimum standards without thoroughly considering the experience for all types of building users can result in buildings that are legally acceptable but awkward or even impossible to use.

Research Question: Is Kansas State University Campus in Manhattan Kansas ADA compliant (follows the current law) and convenient (user-friendly)? This question can be split into two parts:

1. Do the main entrances (entry experience being the sidewalk, ramp, and door) to buildings on the KSU campus comply with current ADA guidelines?
2. Do students on campus find the access to these buildings user-friendly?

Hypothesis: I expect I will find the buildings compliant because the Kansas State University Campus Planning & Facilities Management Department, in charge of making sure KSU is compliant, is constantly renovating and maintaining the buildings. After my personal experience and observations on campus and my discussions with the director of the Student Access Center, I expect others, such as those with disabilities and those using wheelchairs for the first time, will also find access inconvenient.

Integrating Multiple Methodologies

This study uses multiple methodologies to test the research questions of compliance and convenience (Table 4.1). Before anything is tested I figured out what the major issues are. To do this I conducted a focus group made up of students with a physical disability who use wheel chairs and attend Kansas State University. The focus group primarily provides a general understanding of the issues faced by students with disabilities, especially wheelchair users. From their comments I created the qualities for the audit and guided activity. The audit focuses on the compliance research question, while the guided activity focuses on the convenience research question. The audit is formed from combining the KS ADA checklist and the KSU 1992 audit. I used the audit to identify whether buildings are compliant with the current ADAAG. The study was done by personally observing the building sidewalks, ramps, and doors. Finally I asked a group of people to use a wheelchair to navigate campus on a usual day and relate their experience through a survey. The guided activity was formed by combining the focus group topics and audit questions. The Likert scale survey is conducted to gather public opinion about access. Students were asked to go about their day and fill out the survey afterward. Students from the Student Access Center used their own wheelchairs while the students from the Leadership Studies class used borrowed wheelchairs from the Interior Architecture and Product Design Department. I used the guided activity to gauge whether the campus is convenient. I cross referenced the comments of the people in the guided activity with those of the focus group to find commonalities and differences.

Table 4.1: The Three Mini Projects

Mini Project	Focus Group	Audit	Guided Activity
Purpose	background	compliance: buildings meet regulations?	convenience: buildings user-friendly?
Development Methodology	literature review; personal interviews	KS ADA checklist; KSU 1992 ADA checklist	Focus Group topics; Checklist questions
Tool	group discussion	Yes or No checklist	Likert scale survey
Measurement	topic analysis	summary statistics	summary statistics
Subjects	students associated with the Student Access Center	building sidewalks, ramps, and doors	students associated with Student Access Center; students in a Leadership Studies Class

Chapter 5- Focus Group

I used the focus group to learn about the experience of students with a disability at Kansas State University (KSU). I contacted the students through the Student Access Center. Four students attended the discussion. I asked the students to identify access-related issues that they find problematic. The information from the focus group helped create the audit and guided activity and compare observations with the findings of the other methodology.

Methodology

The sample for the focus group was volunteers that use wheel chairs, associated with the Student Access Center (SAC) office on campus. The SAC is a resource for students with disabilities who attend KSU who need assistance. The number of SAC students is limited, so the number of volunteers is even more limited. The focus group allows group discussion and is faster than interviewing the same number of people. This part may have issues if not enough people volunteer. It is difficult to gather enough diversity in volunteers. I identified 10 potential volunteers by emailing and calling students whose contact information was given to me by the director of the Student Access Center. Ten students were contacted, only eight responded, and six could meet at the same time. Only four students, three male and one female, actually participated in the focus group session. Of the four students two use powered chairs and one uses a non-powered chair, and one uses a walker but has used a wheelchair on campus in the past. One student also has a dog as a service animal. Two students are in their twenties and two are in their fifties. The students have been disabled from six months to 22 years. The students have attended KSU from four to 12 years. Not all of them chose to drive, but all of them can.

In the focus group I use students as the unit of analysis and their opinions as the unit of measure. I opened the focus group session, December 6th, 2012, by thanking the participants for their attendance. I gave a short presentation about who I am and what the goal for the session was. We then processed to go through the focus group questions, changing the order with the flow of the discussion. An example of the questions used can be found in Appendix-D. I worried that some volunteers may be uncomfortable speaking in front of others, but all the participants were very vocal about their opinions. Each student contributed their thoughts to every question. Periodically I would ask additional questions for clarification.

Findings/Analysis

The focus group was conducted to find the concerns related to the entrance sequence go campus buildings, including sidewalks, ramps and doors. Students in the focus group expressed concern regarding the material used on the sidewalk because wheels can get caught on some surfaces. They also found it difficult to maneuver around bikers and pedestrians. The students agreed that ramps seem like an afterthought and are usually in odd locations and designed poorly. They identified multiple ramps that even feel dungeon-like. Also, door weight is an issue for the students using non-automatic doors. Even automatic doors can cause issues because the doors may not stay open long enough for students to move completely through the doorway. The addition of backpacks and service animals increase the time needed to move through a doorway.

When asked about any specific building having an issue, Umberger Hall came up. “Umberger has no button in front, only a button at back by loading dock but there are protrusions into sidewalk” (Focus group volunteer, 2012). After completing the audit, I find this statement to be unsupported because Umberger Hall has an automatic opener out front so there is no need to go to the ramp in the back.

Sidewalk

Student’s primary concern on sidewalks was the surface material. Several noted that grates, bricks, and the bump texture used to alert blind people that they are approaching a roadway can all interfere with wheels. These can cause the wheelchair to get stuck or become difficult to control. Obstructions to the sidewalk were also an issue. Stationary obstructions like maintenance vehicles and chained bicycles are common. Moving hazards such as bicyclists and skateboarders make it difficult to maneuver as well. The students did note that snow removal is thorough in most parts of campus.

Students think many issues interfere with the wheels and decrease control of the wheelchair. These issues include sidewalk grates, maintenance covers (such as the plastic sewers by west side of Kramer Dining Center, bricks, cracks, air vents, and bumps for the blind (texture on curb cuts). Students think bricks are an issue when the grout deteriorates away, for example at Thompson Hall (Figure 5.1) because wheels get caught in the grooves and it is difficult to control the chair.

Figure 5.1: Surfaces that Interfere with Wheelchair Wheels



Grates cause problems because the wheels get stuck in the grooves. Sometimes students can just maneuver around them, while other times they are blocking the only accessible entrance, as seen in Figure 5.1 of Willard Hall. The focus group discussion concluded that drains are also an issue for wheelchairs to maintain control. The wheels get caught in the holes and make it difficult to maneuver. After further research, I found this to be a general difficulty for others.

“Boldly perforated drain covers can accept the caster wheels of a chair either spilling the occupant or leaving [them] stranded in an unsafe position. Drains that accept the caster wheels from a wheelchair may also accept many cane or crutch tips. A very serious surprise would result for the unwary user. Grocery cart wheels, stroller wheels, bicycle wheels and slender shoe heels are among the other devices that may become trapped in a drain cover.” (Wachter, 1976, p8).

These grates and drains are represented in the audit as grating openings under sidewalk questions #9 and #10.

The focus group stated the bumps for the blind used on curb cuts were an issue for wheelchairs. I find it concerning that the ADAAG was created to help both the blind and those in wheelchairs, but a guideline that helps one group actually causes difficulty for another. Although studying the blind bumps would create an intriguing study of comparing contradicting needs of the disabled. Creating a study to find other similar issues would be very difficult to accomplish because the sample of disabled students to assist with the research is very limited. Researching other ways of creating a system friendly to both parties would result in an analysis

more focused on concrete forms by a civil engineer or product designer. In order to keep with a larger planning scale, I opt to leave this question to another willing candidate.

Focus group volunteers said that general maintenance is poor at accessible entrances, however, construction crews can also cause a problem. Facilities personnel park in the path of the sidewalks to perform their repairs thus blocking the accessible path for wheelchairs requiring students to “off-road” into the grass. Riding into the grass is sometime unfeasible if the ground is soft and muddy. Other times riding in the grass is just too uneven and difficult maneuver in. Although Facility Management does not keep up on repairs they do provide assistance from weather conditions. Students noted that they are really good about clearing snow throughout campus except by the dorms.

Students stated bikers, while not a structural part of the entrance sequence, are a major hindrance to mobility on campus. “Bikers and skateboarders pose a serious hazard, it is like a stand-off, and they pop out of nowhere and speed and swerve around.” (Focus group volunteer, 2012). Bikers riding around can cause issues, but they also cause issues by parking their bikes in undesirable locations. There was an issue of bikes parked at the entrance to Hale Library, so a sign was put on the railing (Figure 5.2).

Figure 5.2: Bikers are Terrible

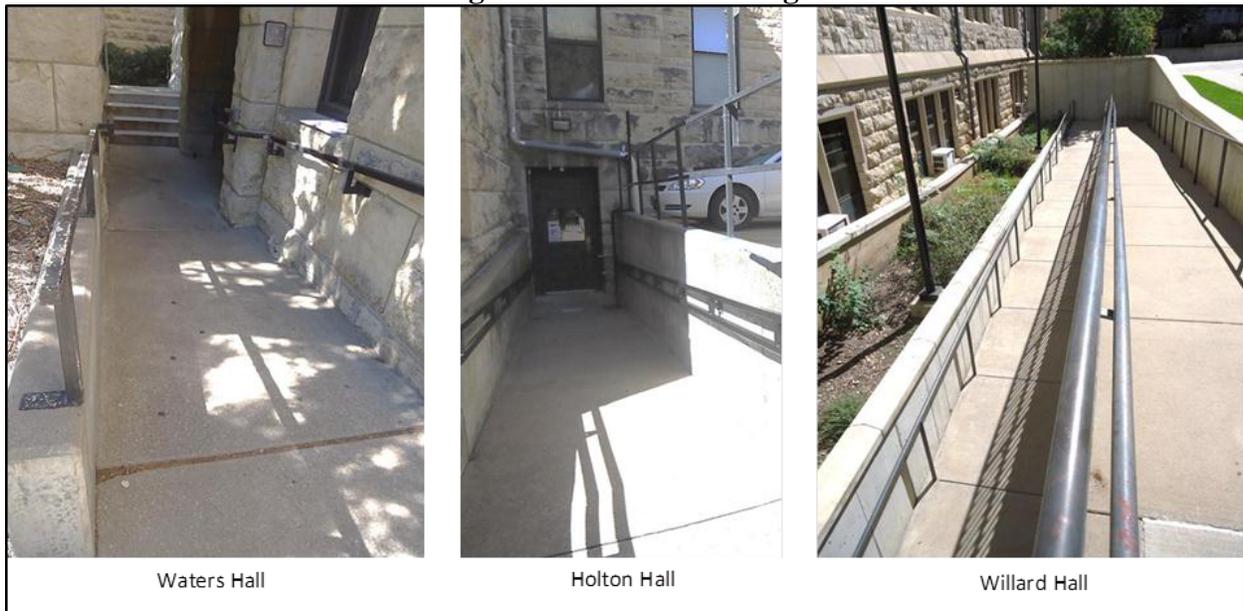


Although bikers are an issue, pedestrians are less problematic. Some pedestrians move out of the way, but some do not; the pedestrians that do move usually move too far. Pedestrians at academic campus usually do not pose a problem, but the ones at the Football Stadium [Bill Snyder Family Stadium] do not get out of the way. When asked how students get to and from campus, the volunteers do not usually use the campus bus system. Instead they usually ride with friends, family, or drive themselves.

Ramp

Overall, students said ramps seem like an afterthought. The accesses to buildings are not very welcoming. Volunteers said Waters Hall access is dungeon-like. After performing the audit, I find this statement to be similar for other structures. Waters access is a tunnel-like entrance, as is Holton Hall, and Willard Hall, shown in Figure 5.3. The area is a confined space and often leads to a basement.

Figure 5.3: Access is Dungeon-like



Door

The survey volunteers stated that the weight, size, handles, and threshold are all issues when it comes to doors. Doors without automation are often too heavy to open and those with automation do not remain open long enough to move through the doorway completely. The extra space taken up by backpacks can cause a problem and allowing enough time for service animals to get through doors is also a concern.

Issues with doors include weight, size, handles, and threshold. If there is no button, students stated they have to wait by door for someone to open it because the doors are usually too heavy to open themselves. The grip of door handles can affect whether a student can open it themselves. Push levers are preferred over round handles. Round handles make it difficult to pull the door open and quickly get into the small opening. The doors usually close on the student and can cause damage to their chair.

When a door is automatic, there is still a problem with timing. Students said they have trouble navigating completely through the entry before the door closes. Communication building [Dole] has a thick door, angled entry, and opens outward. Students said doors are not open long enough because they have to spend time lining up the chair perfectly in order to move through the door.

When students use backpacks or service animals more issues can arise. Students pointed out that backpacks make it difficult to get through narrow doorways. The timed doors barely leave enough time for a student to get themselves through, let alone a service dog. One student said there were times when he got through the door but his dog was stuck on leash outside. The service dog is trained to follow behind him, so narrow ramps are not an issue, but timed doors are difficult to move through with a service animal.

Moving Forward

The findings from the focus group helped gain input to determine if this topic was feasible to pursue. The purpose was to concentrate on how to do the audit and guided activity. After the focus group, it was clear that I needed to test compliance in the audit and test convenience in the guided activity. In addition, I was able to triangulate the findings from the three methodologies to identify reoccurring topics of concern on campus.

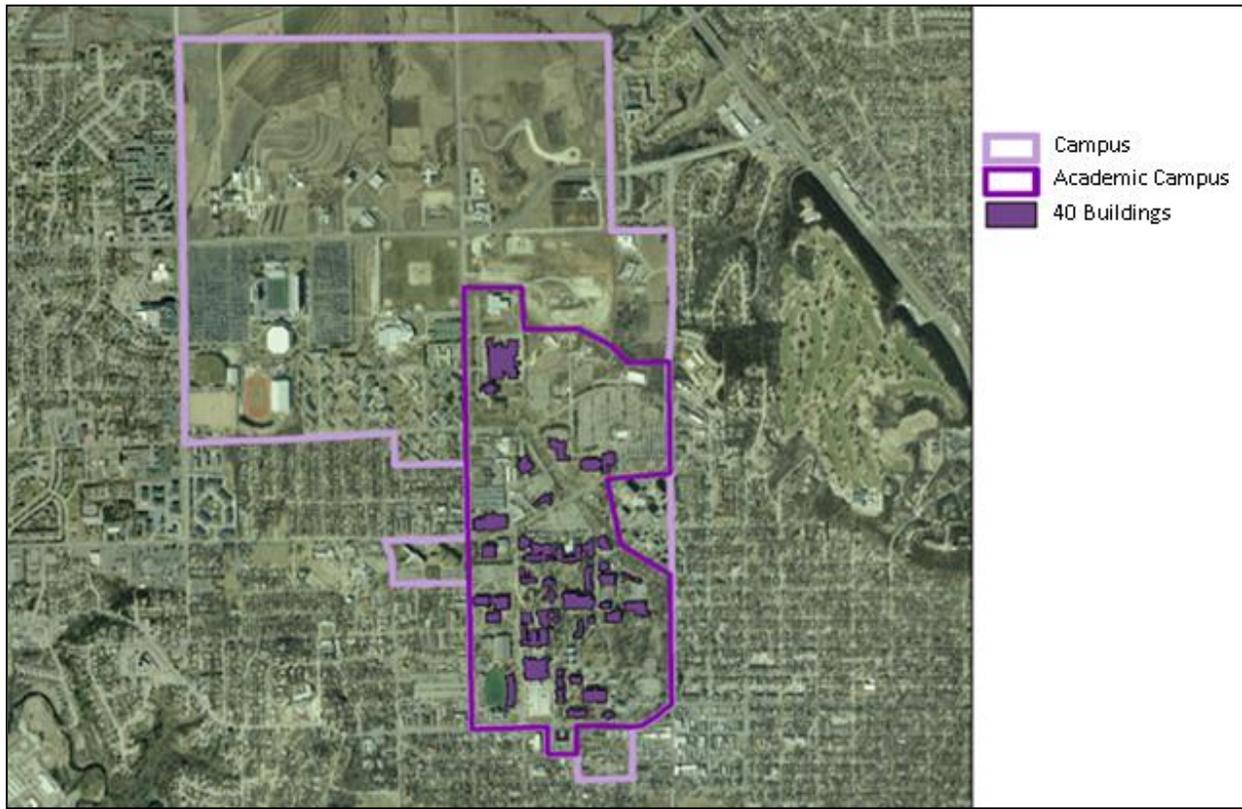
Chapter 6 - Audit

I used an audit to test whether the entry sequence to academic buildings at Kansas State University is compliant with the current ADAAG. The study area was the forty academic buildings because they are the most frequently used by students. I analyzed sidewalks, ramps, and doors leading up to and in the buildings. Even though the results show buildings are compliant with most of the regulations, none of the components of the entry sequence were completely in compliance for all the buildings. Sidewalks were the element that was in the worst condition with cracks and deteriorating concrete, uneven surfaces and some grating openings. Ramps were not needed on most buildings. Doors were the most compliant feature, though most were still not in full compliance. I further analyzed the data to determine whether certain parts of campus were more accessible than other parts.

Methodology

The sample of buildings I analyzed are the 40 academic buildings on the main campus in Manhattan. I test each main entrance for compliance using the checklist I developed. Analyzing the entry sequence of the entire population of buildings on the Kansas State University Manhattan campus is a large endeavor. I reduced the list to only the academic campus (Figure 6.1) by not including the sports complex or housing and dining. I selected the 40 academic buildings (Figure 6.2). This list excludes structures used exclusively for storage or facilities management. Each building was categorized by KSU Facilities classifications. I excluded buildings classified as sport complex, housing and dining, or storage.

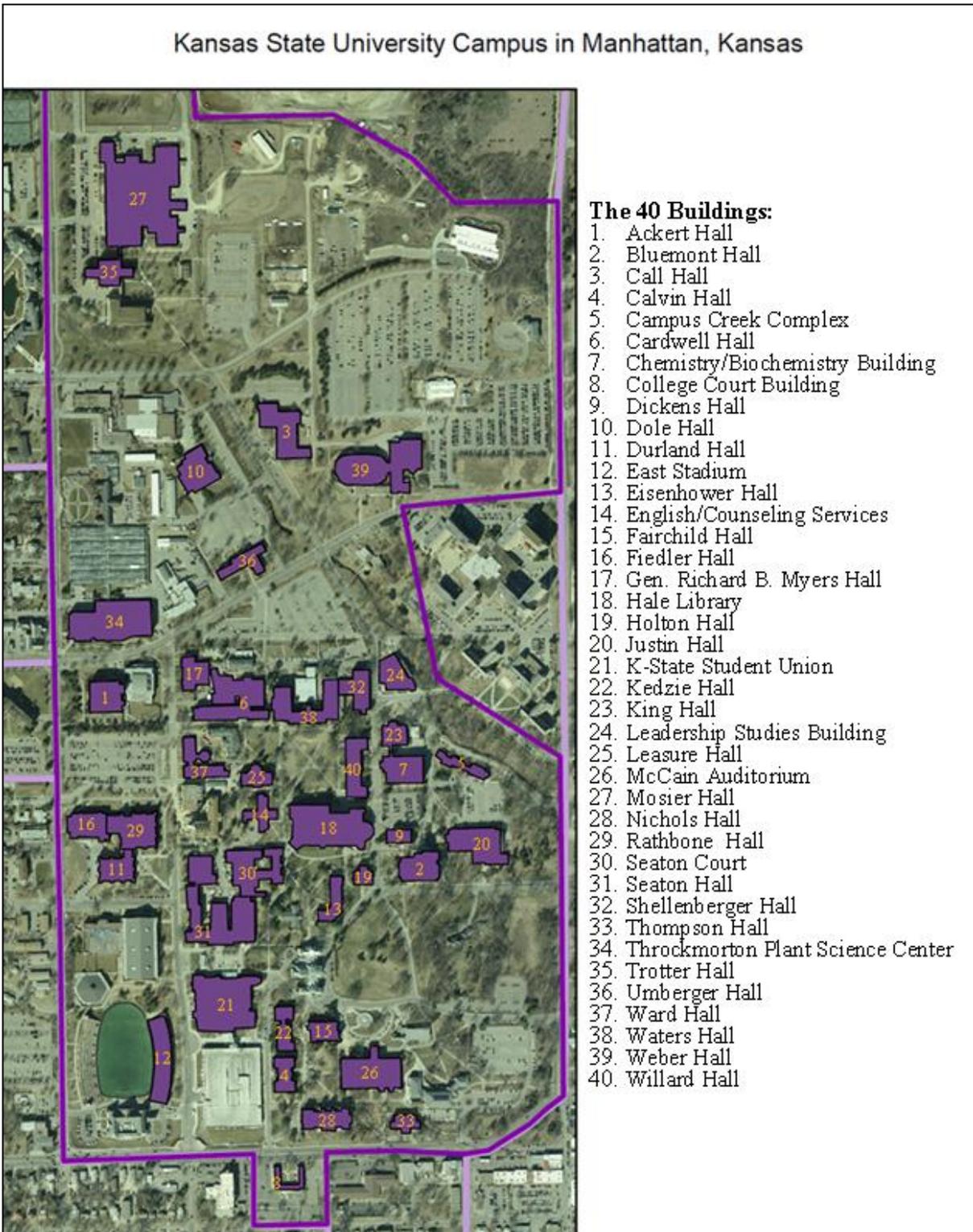
Figure 6.1: Scale of Study Area



To create the checklist, I combined the Kansas Checklist (Access Board, 1993) with the checklist used in the 1992 campus audit (Taussing, 2013). There were 13 items for sidewalks, 23 items for ramps, and 20 for doors or entrances. For each item I checked “Yes” (compliant), “No” (not compliant), or “NA” (not applicable). The results can be tallied for each building and each element. I conducted the audit during daylight hours over the course of fall 2013. I avoided snowy and rainy days so I would not have to walk around in poor weather conditions.

The audit provides an analysis of the current situation of the facilities on campus and if they are compliant with the current code. The focus was on academic buildings on the campus and addressing buildings and entrances most frequently used by students. As an institution of higher education, at least these buildings should be accessible to all Kansans seeking an education.

Figure 6.2: The 40 Buildings Being Studied



Findings

Using the checklist, I tested the main entrance of each building for compliance with current ADAAG standards. While no structure is in full compliance, most structures are largely compliant with the standards. Of the elements studied, doors are in the best condition. Most structures didn't need a ramp, but when needed, ramps are rather compliant.

Entrances

This analysis focuses on the main entrance and whether it is handicapped accessible. The following explanations of entrances and access can be seen in Figure 6.3. As defined by this project, the main entrance is the door closest to the location of the building name sign; if multiple doors apply, then whatever door most students seemed to use is selected for this study. An example of the building sign can be seen at Rathbone Hall.

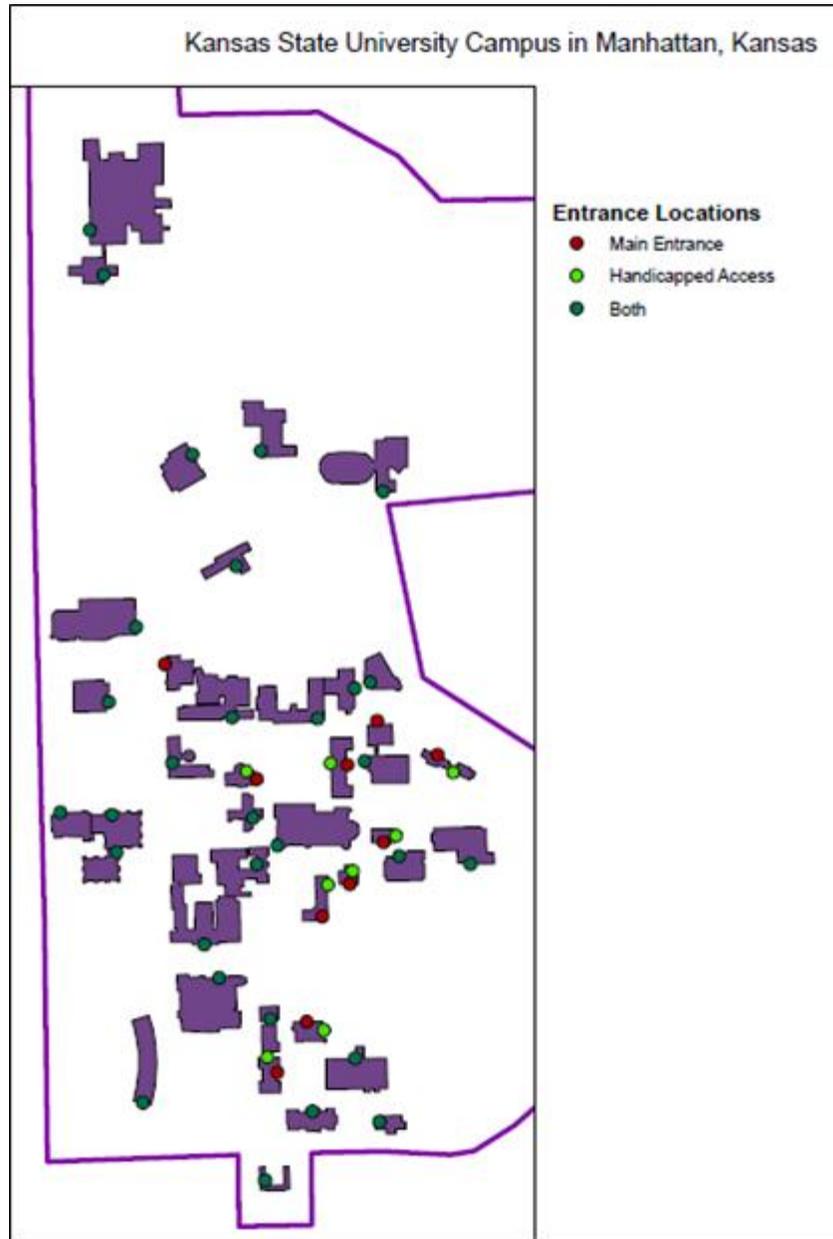
Figure 6.3: Examples of Entrance/ Access



However, some doors were not accessible and pointed to a handicapped access elsewhere; an example of this sign can be seen on Holton Hall. As defined by this project, the handicapped access is any door with a handicapped accessible decal; if multiple doors apply, then whatever door was closest to the heart of campus was used for this study. An example of the handicapped accessible decal can be seen on Ackert Hall. See Figure 6.4 for the main entrances and handicapped accessible entrances analyzed for the audit. If the main entrance and handicapped access are close, and therefore compliant according to the survey, then it is

considered “both” on the map. For example, Seaton Hall is considered “both” because the main entrance and handicapped access are on the same side of the building, but the main entrance is up a flight of stairs while the handicapped access is down a ramp to the basement.

Figure 6.4: Comparing Entrances and Disability Access



General Trends

The count for each Yes (compliance), No (not compliant), and N/A (not applicable) for each element and structure can be seen in Table 6.1. The shaded cell delineates the highest count. For example, for Ackert Hall, most questions about sidewalks meet code (eight of thirteen) so eight is shaded; a ramp was not needed so most of the ramp questions were not applicable (22 of 23) so 22 is shaded; doors were mostly in compliance (12 of 20) so 12 is shaded. At a quick glance, most structures have the majority of questions in compliance, with the exception of King Hall’s sidewalks that have more non-compliance.

Over all most structures are compliant. Of all the items I checked across all three elements and 40 buildings. Sidewalks (66 percent) and doors (63 percent) are mostly compliant. Ramps are mostly not applicable (66 percent), however when they are needed ramps are mostly in compliance (22 percent “Yes” vs 12 percent “No”). The breakdown of these statistics can be seen in Figure 6.5. In general, there was more compliance than non-compliance, but no element is fully compliant.

Figure 6.5: Total Percentages: Yes, No, and Not Applicable

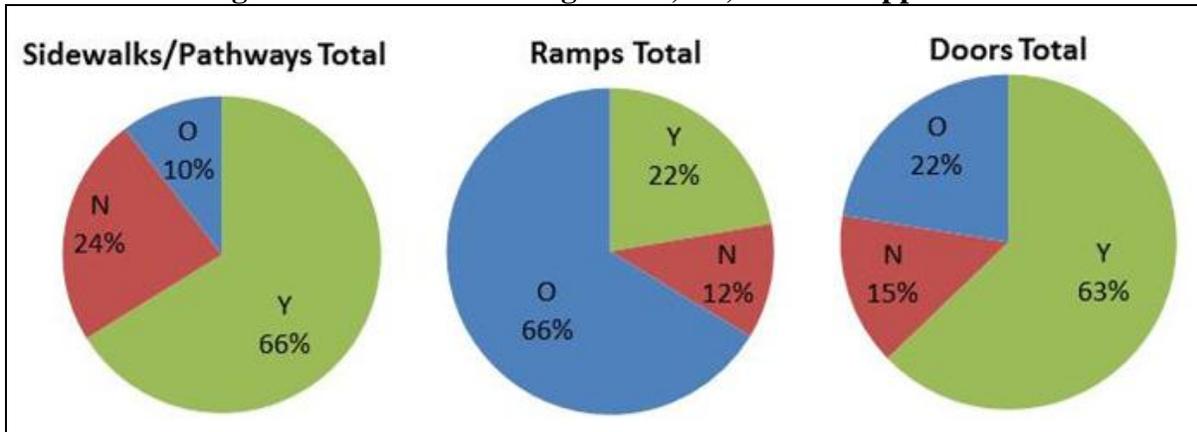


Table 6.1: Checklist Results Per Building

Checklist Results												
Building Name	Sidewalks			Ramps			Doors			Total		
	Yes	No	N/A	Yes	No	N/A	Yes	No	N/A	Yes	No	N/A
Ackert Hall	8	4	1	0	1	22	12	3	0	20	8	23
Bluement Hall	9	2	2	0	1	22	13	2	0	22	5	24
Call Hall	8	4	1	0	1	22	6	4	6	14	9	29
Calvin Hall	9	2	2	5	8	10	13	2	0	27	12	12
Campus Creek Complex	7	6	0	14	9	0	8	2	7	29	17	7
Cardwell Hall	6	6	1	18	4	1	7	3	6	31	13	8
Chemistry/Biochemistry Building	11	1	1	0	1	22	8	2	6	19	4	29
College Court Building	8	4	1	12	9	2	6	4	7	26	17	10
Dickens Hall	10	1	2	1	1	21	11	4	1	22	6	24
Dole Hall	8	3	2	0	1	22	14	1	0	22	5	24
Durland Hall	8	4	1	0	1	22	7	3	6	15	8	29
East Stadium	9	3	1	0	1	22	13	2	1	22	6	24
Eisenhower Hall	8	3	2	14	5	4	13	2	1	35	10	7
English/Counseling Services	10	1	2	0	1	22	6	4	6	16	6	30
Fairchild Hall	7	4	2	1	1	21	12	3	0	20	8	23
Fiedler Hall	9	3	1	0	1	22	12	3	0	21	7	23
Gen. Richard B. Myers Hall	11	1	1	1	2	20	0	0	20	12	3	41
Hale Library	7	5	1	18	2	3	14	1	0	39	8	4
Holton Hall	8	3	2	16	4	3	11	4	1	35	11	6
Justin Hall	9	3	1	0	1	22	8	2	6	17	6	29
K-State Student Union	8	4	1	15	4	4	15	0	0	38	8	5
Kedzie Hall	9	2	2	15	5	3	12	3	1	36	10	6
King Hall	5	7	1	1	2	20	0	0	20	6	9	41
Leadership Studies Building	11	2	0	0	1	22	13	2	0	24	5	22
Leasure Hall	8	3	2	1	1	21	13	2	1	22	6	24
McCain Auditorium	9	2	2	0	1	22	8	4	3	17	7	27
Mosier Hall	10	1	2	0	1	22	9	0	9	19	2	33
Nichols Hall	7	4	2	10	8	5	13	2	0	30	14	7
Rathbone Hall	10	2	1	0	1	22	7	3	6	17	6	29
Seaton Court	8	4	1	0	1	22	5	4	6	13	9	29
Seaton Hall	9	2	2	19	2	2	14	1	0	42	5	4
Shellenberger Hall	7	5	1	0	1	22	12	3	0	19	9	23
Thompson Hall	8	3	2	15	7	1	12	3	0	35	13	3
Throckmorton Plant Science Center	8	4	1	0	1	22	13	2	1	21	7	24
Trotter Hall	9	2	2	0	1	22	9	0	9	18	3	33
Umberger Hall	11	2	0	0	1	22	6	4	6	17	7	28
Ward Hall	9	3	1	0	1	22	7	3	6	16	7	29
Waters Hall	11	1	1	13	6	4	13	2	0	37	9	5
Weber Hall	9	2	2	0	1	22	15	0	0	24	3	24
Willard Hall	8	4	1	16	4	3	10	5	1	34	13	5
Total	344	122	54	205	105	610	400	94	143	949	321	807

Analysis

Sidewalks were the least compliant with 51 percent of buildings having sidewalks in “Good” or “Very Good” condition. None of the buildings had sidewalks that were perfectly compliant. Of the structures that required a ramp, 80 percent were in “Good” or “Very Good” condition although none were perfectly compliant. The majority of doors on the main entrances to the buildings (65 percent) had either automatic access by pressing a button or through motion sensors. However the rest were either not automatic (28 percent), did not have a working button at the time of the audit (2 percent), or worst of all, did not have accessible access to the door (5 percent). There was no clear spatial pattern in the availability or condition of accessible entrances.

The themes evaluated from the audit are sidewalk condition, ramp location, ramp condition, door condition, and door category. The sidewalk condition is mostly “Okay” with seven to eight “Yes” out of thirteen. However, sidewalk condition for King Hall is “Bad” with more “No” than “Yes”, and Cardwell Hall is “Tie” with equal “Yes” and “No”. Ramps are not needed 52 percent of the time, but when they are needed they are usually located near the main entrance. The ramp condition is mostly “Good” with 13 to 17 “Yes”. Calvin Hall, however, is the only building in “Bad” condition with more “No” than “Yes”. The door condition is the best element of the entry sequence with no “Bad” and two buildings in “Perfect” compliance. The door category was analyzed to compare what doors were automatics and non-automatic. Sixty-four percent of structures have working automatic doors. Sidewalks are the element in the worst condition; ramps are not usually needed; doors are the element in the best condition.

Sidewalk Condition

I tallied the number of compliant and non-compliant items under the sidewalk heading. In terms of the detail on sidewalks, the number of “Yes” (compliant) responses was tallied for each structure to gauge an overall level of compliance. No structures have a perfect score of 13 “Yes” out of 13 questions. As shown in Table 6.2, 45 percent of structures were Okay with seven to eight “Yes”. Two percent of structures were rated “Bad” (more No, than Yes), and one structure was “Tie” (equal numbers of compliant and non-compliant items).

Table 6.2: Sidewalk Condition

Sidewalk Condition			
Count of "Yes"	Analysis	Total	Percent
5	Bad	1	2%
6	Tie	1	2%
7 to 8	Okay	18	45%
9 to 10	Good	15	38%
11 to 12	Very Good	5	13%
13	Perfect	0	0%

King Hall is the structure with sidewalks in “Bad” condition; the major contributing factors to this low score were protruding objects, grating openings (See Figure 6.6), and slope. Cardwell Hall is the structure with the condition rating “Tie”. Non-perpendicular gradient openings and stairs in the access path were the reasons it was marked down. As shown in Figure 6.7, Cardwell has a set of stairs right in its line of access to the main entrance.

Figure 6.6: Grating Opening Issues

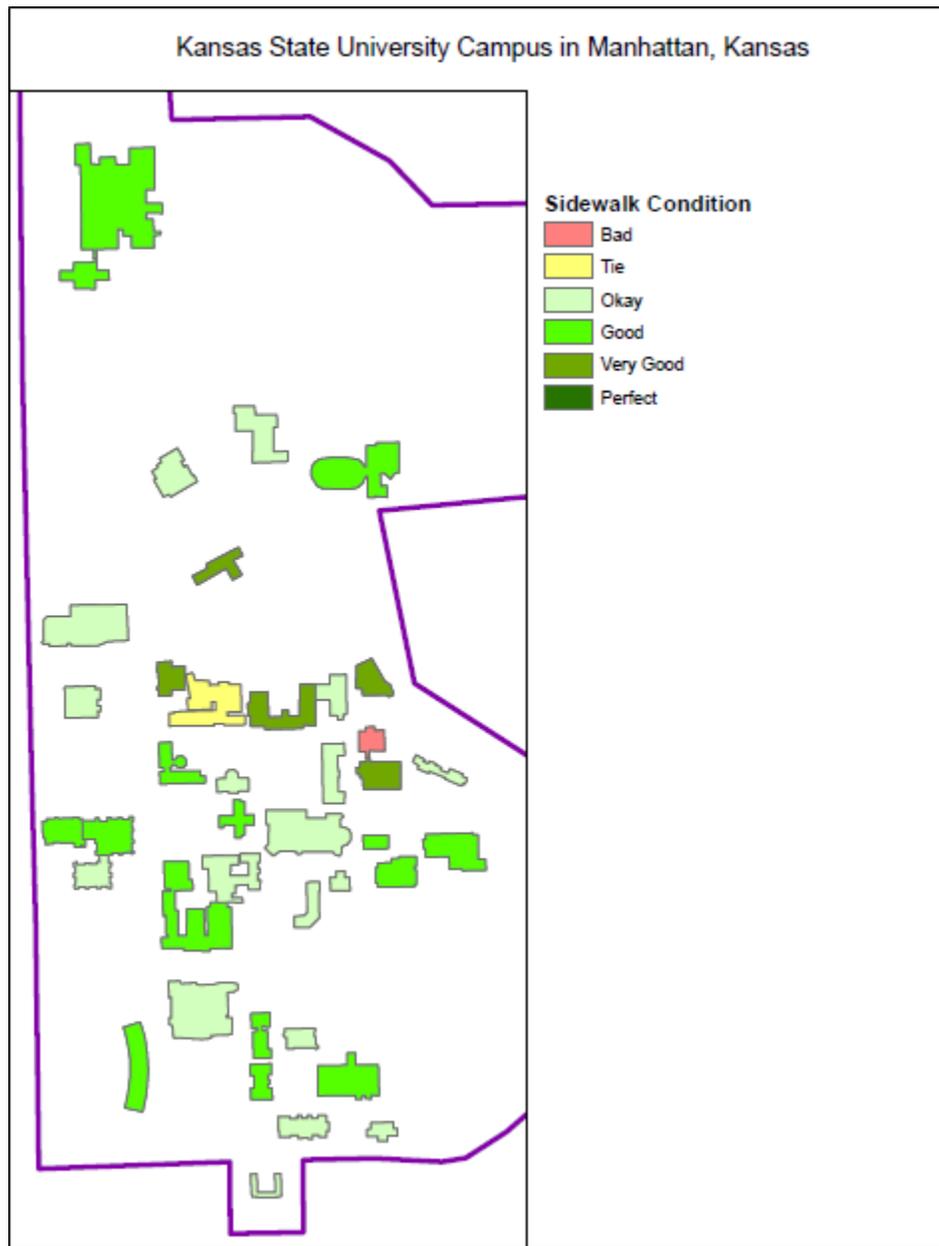


Figure 6.7: Cardwell Access



I mapped the sidewalk condition (Figure 6.8) to identify any spatial trends. The structures with the highest rating (Chemistry/Biochemistry Building, Leadership Studies Building, Waters Hall, Gen. Richard B. Myers Hall, and Umberger Hall) are mingled with the lowest rating (King Hall) and (Cardwell Hall). This means the center of campus has both the best and worst conditions while the structures on the outskirts of campus are in “Okay” condition. There is no clear spatial pattern to the distribution of sidewalk condition.

Figure 6.8: Sidewalk Condition Spatial Analysis



Ramp Condition

I rated the condition of the ramps based on 23 items. As shown in Table 6.3, 65 percent of structures do not even need a ramp. Of those measured, no structures have a perfect score of 23 “Yes” out of 23 questions. Eight structures were “Good” with 13 to 17 “Yes”. Similar to sidewalk condition, one structure was rated “Bad” (more non-compliance, than compliance), but unlike sidewalks, no structures were “Tie”. Two buildings fall into the category “Okay” is eight to twelve compliant items.

Table 6.3: Ramp Condition

Ramp Condition			
Count of "Yes"	Analysis	Total	Percent
0 to 1	No Ramp	26	65%
2 to 7	Bad	1	2%
8 to 12	Okay	2	5%
13 to 17	Good	8	20%
18 to 22	Very Good	3	8%
23	Perfect	0	0%

Figure 6.9 shows examples of issues related to ramps including non-continuous handrails (Cardwell Hall) and an unclear path (Thompson Hall). While most ramps observed were made of concrete, one structure was not. College Court Building is the only building that has a ramp made of wood, shown in Figure 6.10. After further research, this ramp was found to be in compliance because wood is an acceptable material.

Figure 6.9: Examples of Ramp Condition

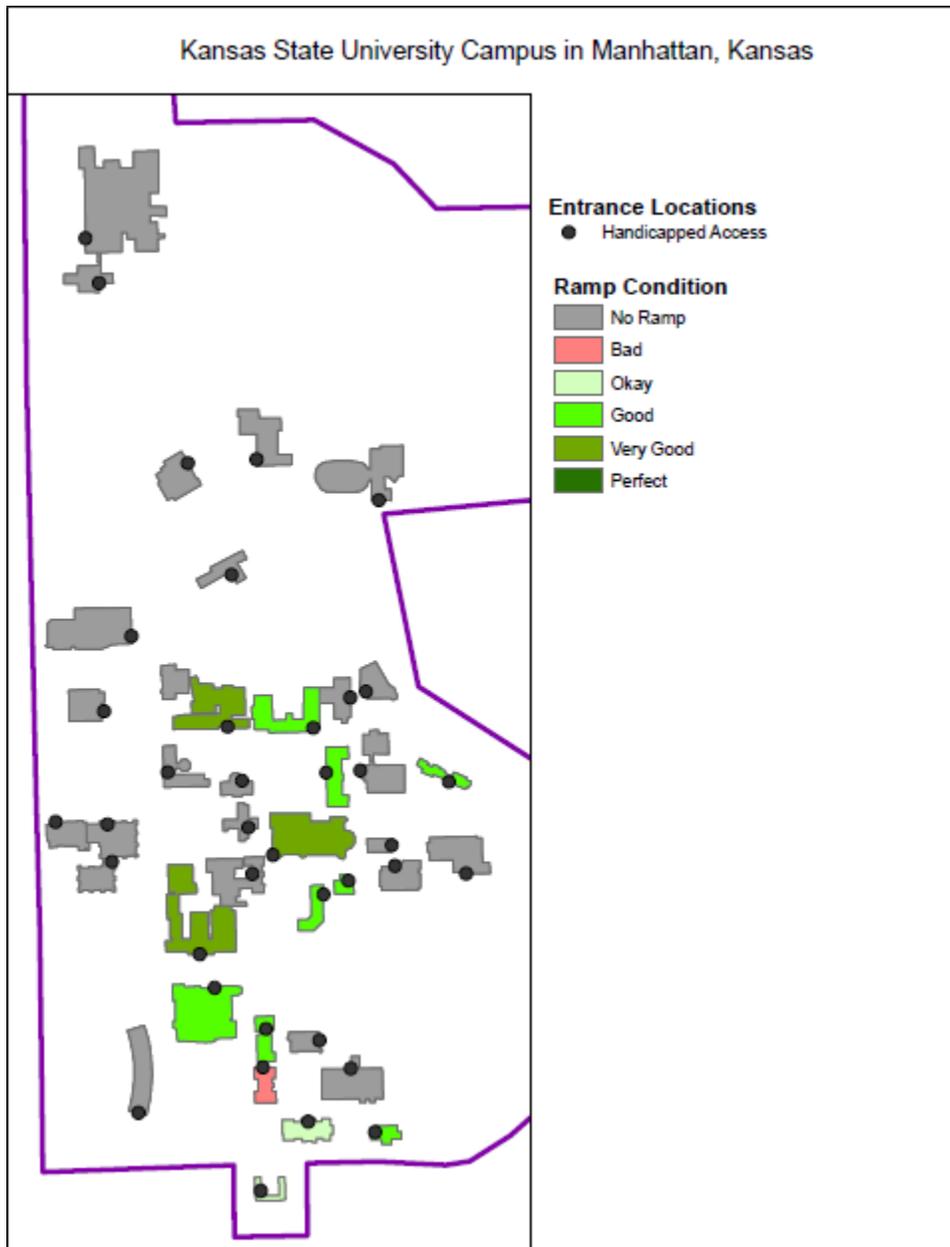


Figure 6.10: Wooden Ramp



I mapped the ramp condition (Figure 6.11) to identify any spatial trends. The best structures (Hale Library, Seaton Hall, and Cardwell Hall) are located in the center of campus. Structures with a lower compliance rate (College Court Building, and Nichols Hall) are located on the southern part of campus. Calvin Hall, also located near the southern part of campus, is the only structure has ramps in “Bad” condition.

Figure 6.11: Ramp Condition Spatial Analysis



Access/Ramp Location

The data pertaining to ramps was categorized according to the location of the ramp in relation to the main entrance. A little under half (forty-two percent) of structures did not need a ramp at all, for example McCain Auditorium (Figure 6.12).

Figure 6.12: Entrance Examples



Table 6.4 shows the next most common location of the ramp was near the main entrance. Seventeen percent of structures have the ramp near to the door. Thus, if a ramp was needed it was usually close to the main entrance, for example Seaton Hall shown in Figure 6.12. Two buildings had the ramp as the only access point. Three structures did not have a ramp near the entrance, but once you moved to the other access point, no ramp was needed. Most of the time, however, the other access point had a ramp. General Myers Hall and King Hall have no wheelchair access at all.

Table 6.4: Access/Ramp Locations

Access/Ramp Location		
Data	Total	Percent
Main Entrance Access: no ramp needed	21	52%
Main Entrance Access: ramp is only access	2	5%
Main Entrance Access: ramp near door	7	17%
Other Access: no ramp needed	3	8%
Other Access: ramp needed	5	13%
No Access	2	5%

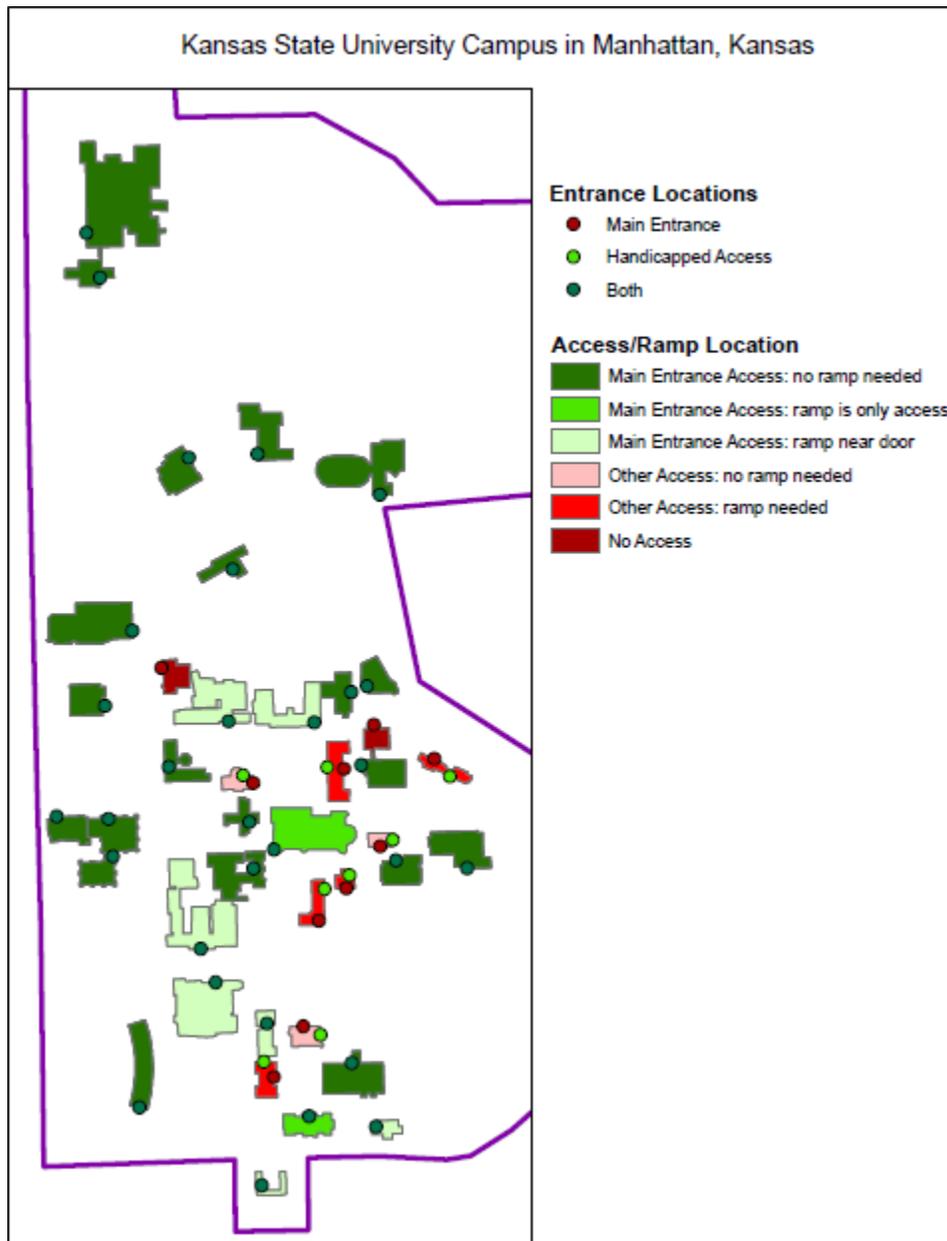
Figure 6.13: Lack of Accessible Access



Sometimes the handicapped sign was inappropriately placed. Campus Creek Complex had a handicapped access decal by the door, but there was a staircase and no ramp. Someone must have mislabeled the entrance. This situation can be seen in Figure 6.13.

I mapped the access/ramp location for the main entrance to the buildings (Figure 6.14) to identify any spatial trends. The 21 structures that do not need a ramp are spread all throughout campus, but they are more concentrated in the northern part of campus. When comparing ramp location to ramp condition, it can be discerned that ramp quality and ramp location are not consistent. For example, Holton Hall has a “Good” ramp condition, but it is located at another access point which is not desirable. The Student Access Center is located in Holton Hall, where students using a wheelchair have to travel out of their way to get access inside.

Figure 6.14: Access/Ramp Location Spatial Analysis



Door Condition

I evaluated the compliance of doors based on 15 items. The other five door related questions address characteristics of the door such as handle type. Two structures have a perfect score of 15 “Yes” out of 15 questions. As shown in Table 6.5, 18 structures’ doors were in “Very Good” condition with 12 to 14 compliance. Unlike both sidewalks and ramps, no structures were “Bad” (more non-compliance, than Yes). The doors at General Myers Hall and King Hall could not be studied because there was no wheelchair access to the door. General Myers Hall has steps at the door. King Hall does not have its own handicapped accessible entrance, but instead students enter the Chemistry/Biochemistry Building and navigate to King Hall.

Table 6.5: Door Condition

Door Condition			
Count of "Yes"	Analysis	Total	Percent
0	No Access	2	5%
1 to 4	Bad	0	0%
5 to 8	Okay	13	33%
9 to 11	Good	5	13%
12 to 14	Very Good	18	45%
15	Perfect	2	5%

Table 6.6: Door Handle Type

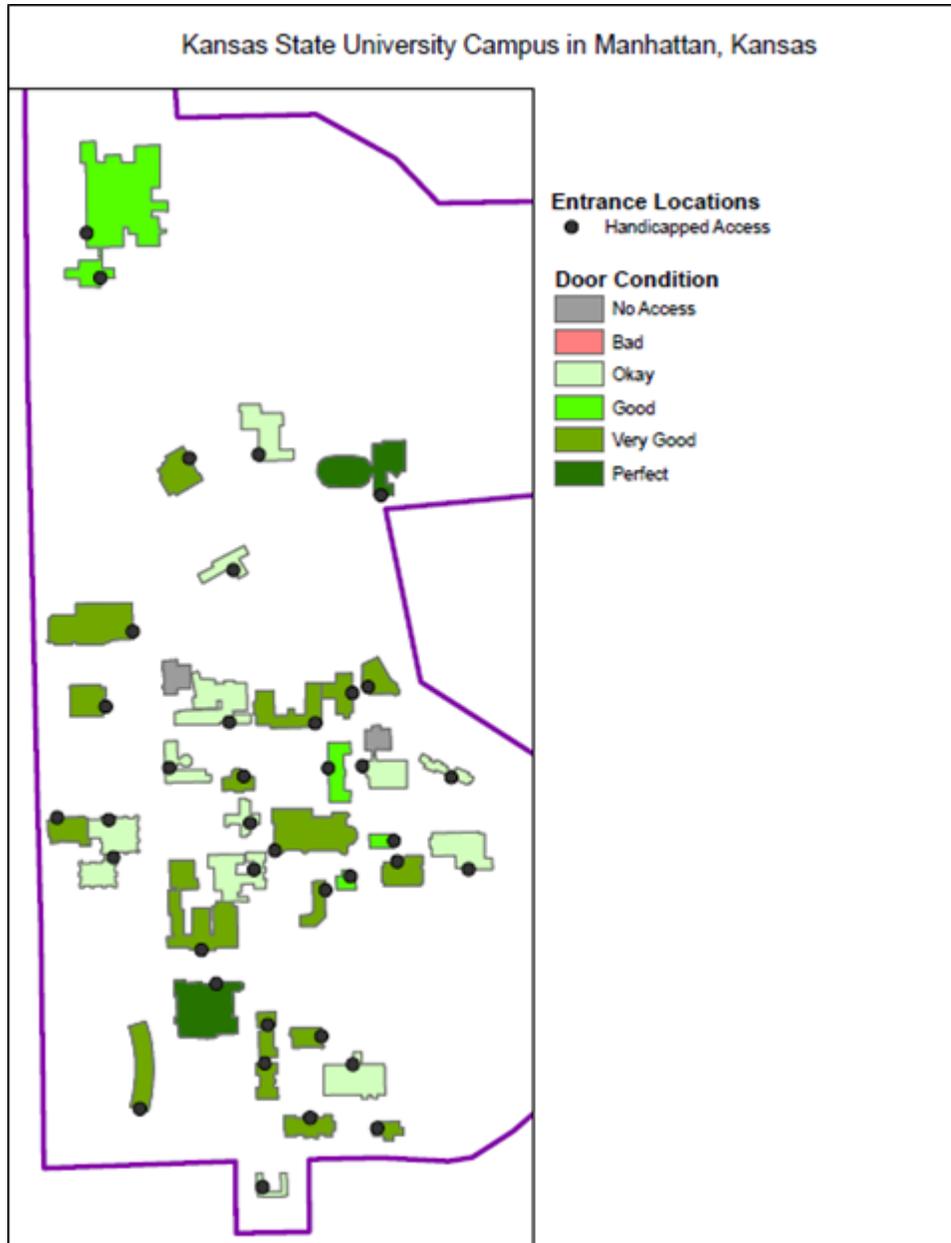
Door Handle Type		
Handle Type	Count	Percent
Pull	21	52%
Lever	15	38%
N/A	4	10%

The door width criterion (checklist question #5) is not code compliant on most structures. This 32 inch requirement was not met because of the design of the door. The doorway itself was 32 inches, but the access was smaller. The access is dependent on how much space the push bar takes up in the path of entry. If the push bar hangs far off the door it is protrusive to the access path making the accessible width no longer 32 inches and therefore no longer code compliant.

The door condition was only taken out of 15 because the other five questions about doors are more about inventory than meeting specific criteria. An example of inventory question (checklist question #11) would be the door handle type. The most common was a pull handle. Fifty-two percent of handles were pull and 38 percent were lever, as shown in Table 6.6. This inventory helped determine whether the door was able to open without twisting of the wrist (checklist question #10).

I mapped the door condition (see Figure 6.15) to identify any spatial trends. The best structures (K-State Student Union and Weber Hall) have no spatial pattern. A very general trend is that the conditions are best south-west diagonal up to north-east. There is not a strong spatial relationship to compliance.

Figure 6.15: Door Condition Spatial Analysis



Automatic Door

The data pertaining to doors was categorized according to whether it was manual or automatic. ADAAG does not require doors to be automatic, but automatic doors are more user-friendly. As shown in Table 6.7, more than 60 percent of buildings were designed to be automatic. However, at McCain Auditorium the button was not working. Trotter Hall and Mosier Hall did not require a button to be pushed; these doors were motion activated, shown in Figure 6.16. These buildings house a working veterinary, which may explain why they have such advanced door technology.

Table 6.7: Automatic Door Categories

Automatic Door		
Data	Total	Percent
Automatic: No Button Needed	2	5%
Automatic: Button Working	24	60%
Automatic: Button Not working	1	2%
Non Automatic: No Button	11	28%
No Access to the Door	2	5%

A key element of the design of an automatic door is the placement of the button. While creating the audit, I found a height restriction of 48 inches, but no guidelines regulating how far away the button should be placed from the door. I was curious where buttons are placed on campus, so I added checklist question #14-*How far is the door opener from the door?* The range is 42 to 113 inches away with an average of 72. Some buildings have unconventional buttons, as shown in Figure 6.17. At Holton Hall, the button is behind the railing and not easy to reach. At College Court Building, there is no button, but instead a door bell with a sign “Ring Bell for Service”. The bell was tested, and a faculty member came to open the door. At the other end of the spectrum, Calvin Hall has two buttons; each at a different height.

Figure 6.16: Automatic Door

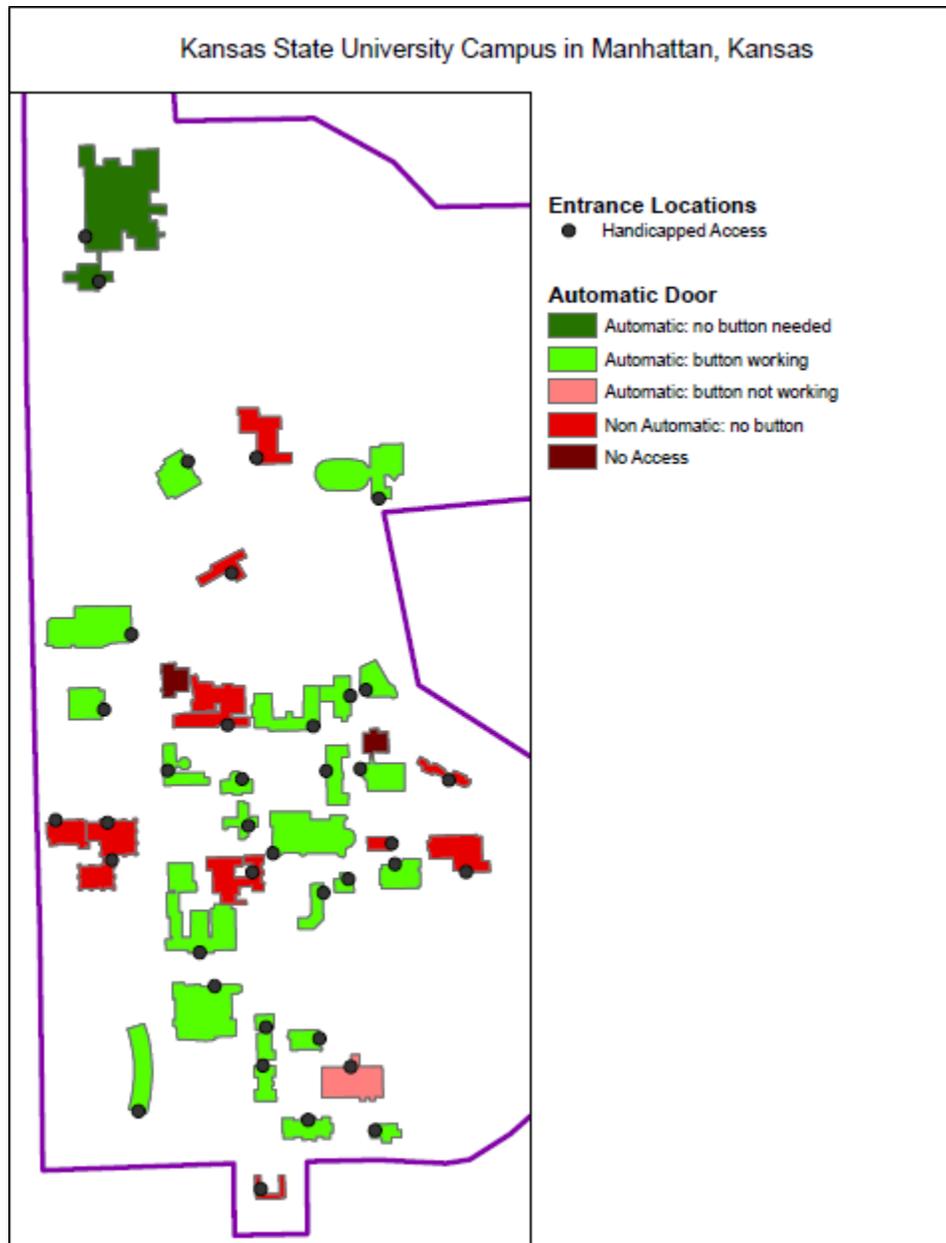


Figure 6.17: Unconventional Buttons



I mapped the automatic door categories (see Figure 6.18) to identify any spatial trends. Trotter Hall and Mosier Hall, the best structures, are located on the far north-west side of campus. There is no clear spatial relationship. A very general trend is that the working buttons are best south-west diagonal up to north-east.

Figure 6.18: Automatic Door Spatial Analysis



Chapter 7 - Guided Activity

The guided activity was a way to gather student opinion about disability access. The survey questions were based on the checklist so the results are easily comparable. The students were asked to go about their day and fill out a post-activity survey. The volunteers were both disabled and non-disabled students. Students with disabilities used their own wheelchairs while the students without a disability used borrowed wheelchairs. In general, the volunteers felt the sidewalks were in bad condition, ramps were okay, and doors were in good condition.

Methodology

I conducted an activity to gather public opinion of the convenience of the building accessibility for wheelchair users. The activity was done by a group of students, some with a physical disability and some who do not have a physical disability who were either part of a class in the leadership studies department or who were associated with the Student Access Center. Students went about their usual day on campus using a wheelchair. At the end of the day they filled out a questionnaire to record their experience.

The students in the sample were four students who regularly use a wheelchair and 10 students who do not. The students who regularly use a wheelchair were contacted through the Student Access Center. They were different students than those that were involved in the focus group. The students who did not regularly use a wheelchair were taking the class, LEAD 502: Disability Studies. I chose both disabled and non-disabled students because I thought the two groups may perceive accessibility differently. The test was done for students with a physical disability and students without a physical disability to compare perception of students. This method had issues of getting enough people of each group to volunteer. Thus, there was no comparison done between the two groups' results. The public perception should be a sample of the public but it was difficult to gather enough variety in volunteers. It was challenging to gather a diverse and comparable sample of both groups.

The 14 students that participated in the activity have attended KSU from two months to six years. All students without a disability have not used a wheelchair before this study. All students with a disability have thought about access on campus before. Four of the 10 non-

disabled students claimed to have thought about access on campus before. This response has no pattern (no trend of being earlier or later in the semester, the response is spread throughout the semester). More detail can be found in Appendix-F.

This method uses students as the unit of analysis and their opinions as the unit of measure. The opinions were gathered by using the survey which uses multiple choice questions to gather demographic information (shown in sample section) and a Likert scale to gather opinions (survey questions are in Appendix-F results are in the Findings section), trends discussed in the Analysis section. I used information from the ADAAG and information from the focus group to create the content for the survey. Using a Likert scale made it easy to quantify students' opinions. The survey questions were directly related to the checklist in order to allow comparisons of compliance and user-friendliness in the analysis. The activity was conducted throughout November 2013. The students from the Student Access Center received the instructions via email, while the students from the leadership studies class were informed by me visiting their class. Each of the non-disabled students signed up for a date to borrow a wheelchair. At the end of the day they returned the wheelchair to me and filled out the survey. The disabled volunteers used their personal wheelchair. At the end of the day they gave the survey back to Andrea Blair, the director of the Student Access Center. I later picked up the forms from Blair.

The guided activity helped participants identify whether it is difficult to get around campus when using a wheelchair. The survey gathered their opinions of the experience. Because the questionnaire was based on the checklist, there is the possibility to compare the opinions of the participants in the guided activity with the findings of the audit.

Findings

At the end of their day in a wheelchair, each participant filled out a questionnaire about their experience. Each volunteer was asked to list what buildings they visited. Seventeen buildings were visited during the activity by one or more participants. In general, participants thought the sidewalks were in bad condition, ramps were okay, and doors were in good condition.

Buildings Visited

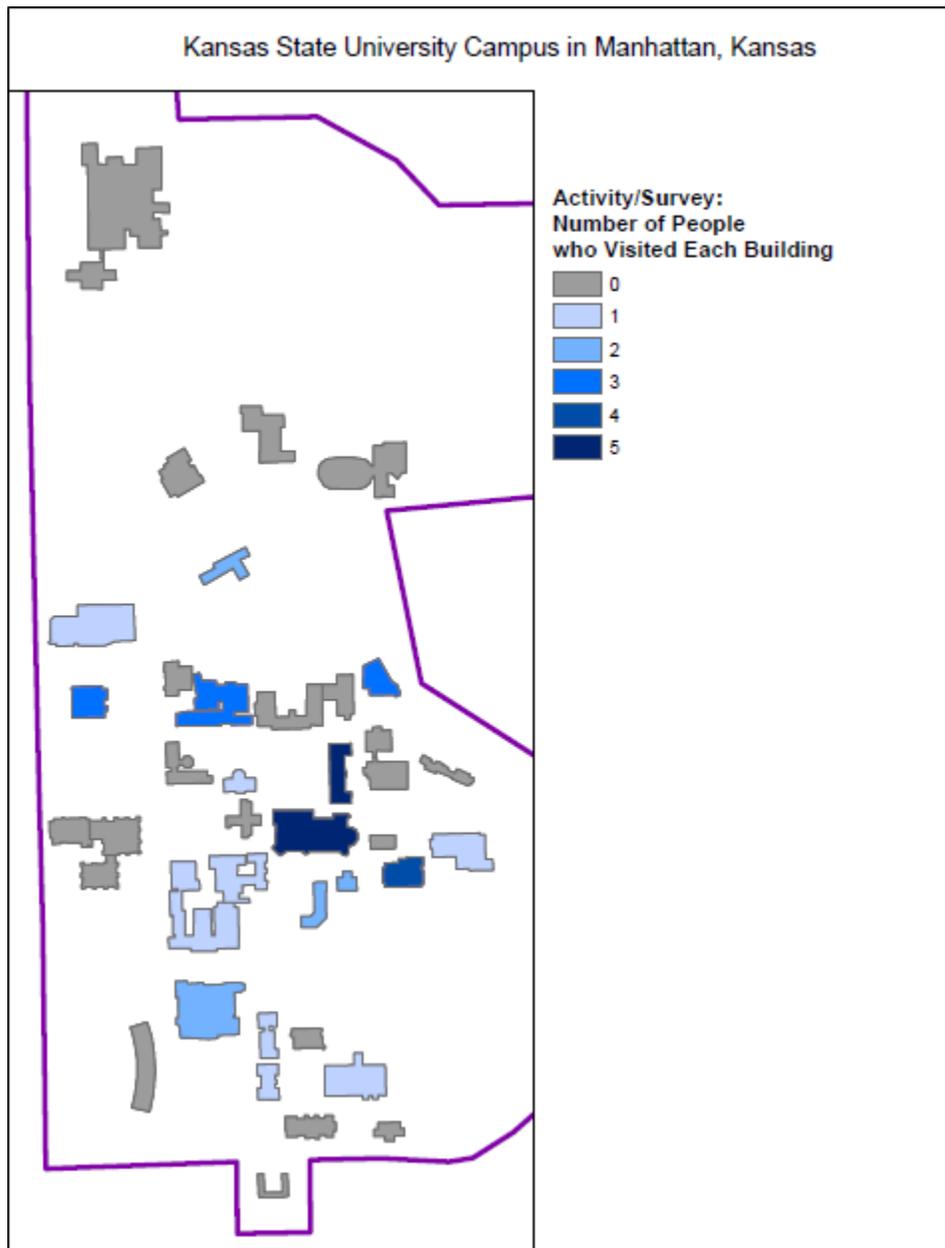
Because students were asked to go about their normal day, not all buildings were visited. Fifty-seven percent of student participants visited three to four structures. About a third of student participants visited one to two structures, 14 percent visited five to six structures, and no one visited more than six. More detail can be found in Appendix-F. To put this into perspective, more than half of the 40 structures were not visited in this activity. However, there was some consistency to the structures visited (Table 7.1). Seventeen percent of campus buildings were visited only once, for example Throckmorton Plant Science Center. Twenty-six percent of structures were visited more than once, ranging from two to five times. A full list of structures and their count can be found in Appendix-F.

Table 7.1: Number of People Who Visited Each Building

Activity/Survey:		
Number of People who Visited Each Building		
Times Visited	Number of Buildings	Percent of Buildings
0	23	57%
1	7	17%
2	4	10%
3	3	8%
4	1	3%
5	2	5%

I mapped these buildings, shown in Figure 7.1, to see if there was a spatial trend. The core of campus near Hale Library and Bluemont had the most concentration of visits, five and four respectively. K-state Student Union, surprisingly only had two visits. The campus outskirts near to the north, Mosier Hall, or south, College Court Building, understandably were not visited on this activity. However, this could be due to the fact that Mosier is Vet-Med and College Court Building is continuing education, both of which freshmen would not likely be visiting.

Figure 7.1: Number of People Who Visited Each Building



Survey Results

The survey questions use a Likert scale of one to four. One is Strongly Agree/Always, two is Agree/Most of the Time, three is Disagree/Some of the Time, four is Strongly Disagree/Never, N is Not Applicable/Didn't Notice. An example of the survey can be found in Appendix-F. The results are shown in Table 7.2. The survey is tallied by counting the number of times each choice was selected. For example, five people picked "Agree" for sidewalk question #5: "the slope of sidewalks were too steep". The most common response for each question is highlighted.

In order to write the survey questions so most students could understand them, the questions were not all written so "Strongly Agree" always meant a good thing. For example, sidewalk question #5 is "The slope of the sidewalks were too steep." The fact that "Agree" was chosen is actually a bad thing. Therefore the data from the Likert scale is transferred into a scale from "Very Good", "Good", "Bad", and "Very Bad" (shown in Dark Green, Green, Red, and Dark Red respectively). Blue refers to responses that are indifferent in nature.

Figure 7.2 shows the count of each time "Very Good", "Good", "Bad", or "Very Bad" was the most common response per survey question. For example, three sidewalk questions (sidewalk #2-plenty of room to pass people, #4-large gaps provided difficulty to maneuver, and #5-slope of the sidewalks were too steep) of all 5 sidewalk questions had "Bad" as the most common response, therefore the "Bad" bar on the graph shows three. Overall, ramps are considered to be the most accessible (five "Very Good"), with doors next (four "Very Good"), and sidewalks last (one "Very Good").

Continuing with the same example, three of the five sidewalk questions are rated "Bad", 60 percent (Figure 7.3). Sidewalks have the most consistent responses with of sidewalk responses rated across all questionnaires. Seventy percent of door responses across all questionnaires were rated "Good/Very Good" while only 54 percent of ramp responses were also "Good/Very Good". Ten percent of responses rated doors "Very Bad" while none of the responses rated ramps "Very Bad". Thus participants thought doors were both "Good" and "Bad". A detailed examination of the separate survey questions are discussed in the Analysis section

Table 7.2: Count of Survey Responses

	1-Strongly Agree	2- Agree	3- Disagree	4- Strongly Disagree	N- N/A
Sidewalk/Pathway					
1. Accessible pathways were free of steps and stairs	2	6	5	1	
2. Plenty of room to pass people	2	3	6	3	
3. Difficult to maneuver around protruding objects		1	6	7	
4. Large gaps provided difficulty to maneuver	2	5	4	3	
5. Slope of the sidewalks were too steep	3	5	2	4	
<i>Sidewalk/Pathway Total</i>	9	20	23	18	0
Ramp					
1. Used a ramp to get inside	10	2	2		
2. Near the main entrance	3	4	5	2	
3. Too steep	1	8	1	4	
4. Surfaces were made with a non-slip material	3	3	3	1	4
5. Free of obstacles protruding into the pathway	7	4	3		
6. Large gaps provided difficulty to maneuver		5	2	7	
7. Plenty of room on landings to make turns	3	6	3	2	
8. Railings were provided	4	4	1	2	3
9. Railings at an accessible height	3	3	3	2	3
10. Railings made with an adequate gripping surface	3	1	5	1	4
11. Railings fixed so they don't rotate	5	3	1	1	4
12. Railings secured properly to hold weight	6	2	2	1	3
<i>Ramp Total</i>	48	45	31	23	21
Door/Entrance					
1. Canopies large enough to protect from weather		4	6	1	3
2. Plenty of room to maneuver in front of the doors	2	6	4	2	
3. Plenty of room to fit through the doorways	4	4	5	1	
4. Door thresholds were too steep	1	2	5	5	1
5. Mostly automatic (Au) or not automatic (Nau)?					
5a. Au: buttons worked properly	6	4	3		1
5b. Au: open long enough to get through	9	2	1	1	1
5c. Nau: easy to open doors while seated	1	1	2	7	3
6. Handles operable without tight grasping	2	6	3	2	1
7. Hardware mounted at an accessible height	6	5	1	1	1
<i>Door/Entrance Total</i>	31	34	30	20	11
Over all, did you follow your usual path?	2	6	3	3	
Grand Total	90	105	87	64	32

Figure 7.2: Opinion of Condition-Data Counts

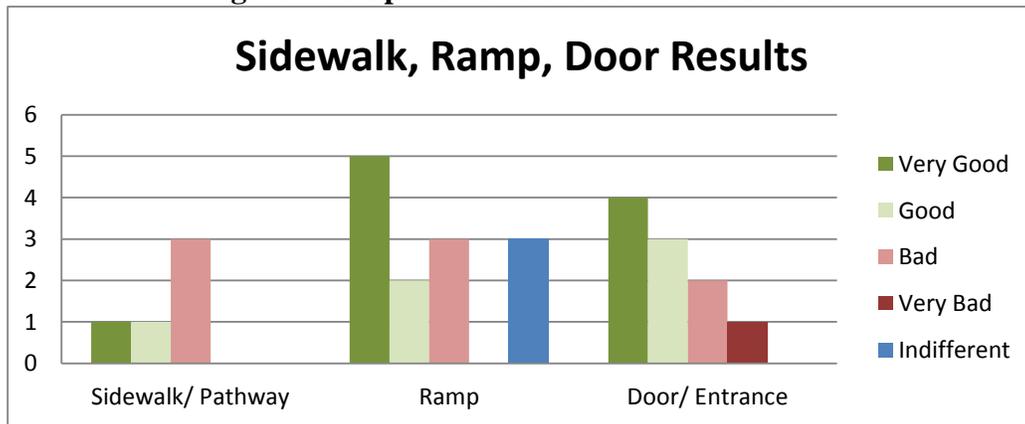
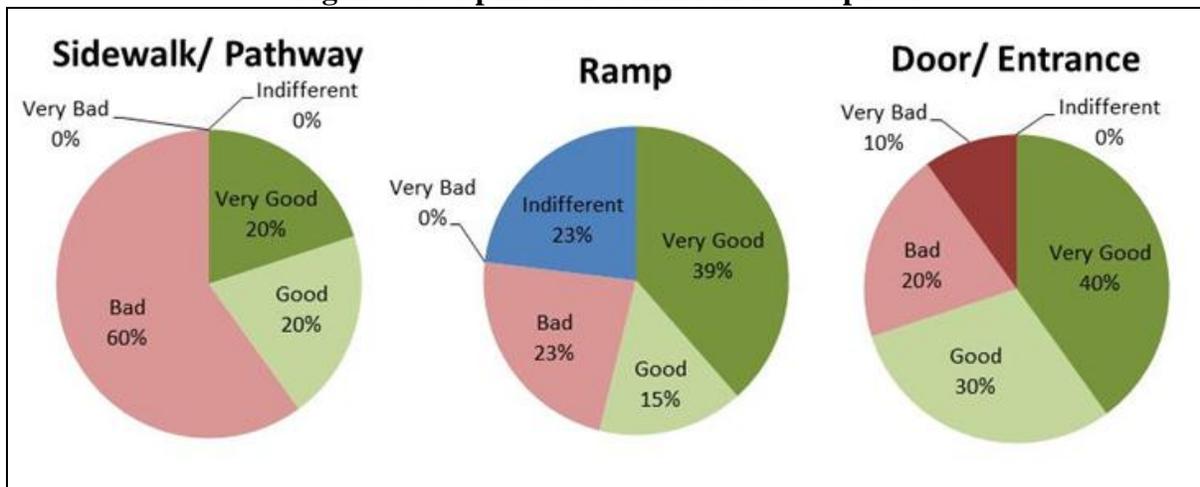


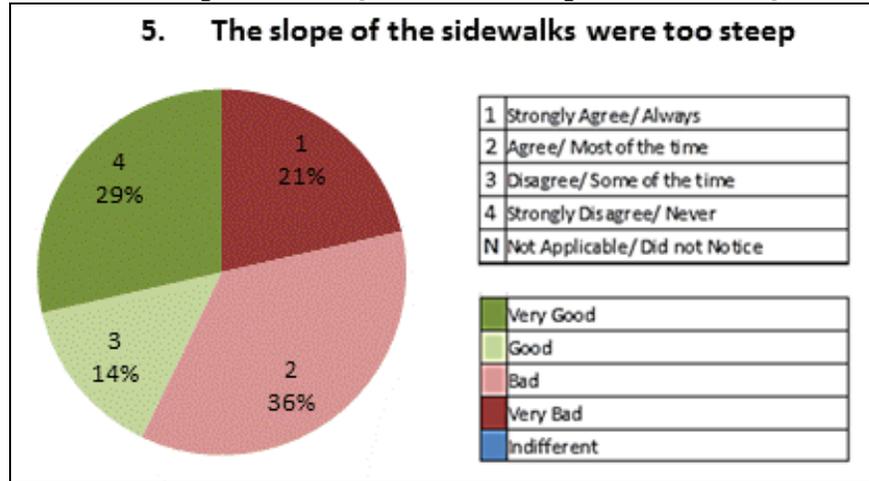
Figure 7.3: Opinion of Condition-Data Spread



Analysis

It is one objective to know the answer that the majority of people responded. The next step is to compare the spread of responses. This section analyzes how strong an opinion is by comparing the percentage of each response per question. The most common response is not necessarily the majority opinion. To explain, I shall use the example from the Results section, sidewalk question #5: “The slope of the sidewalks were too steep” (shown in Figure 7.4). As discussed above, the most common response picked was “Agree”; five people said “Agree”, four said “Strongly Disagree”, three stated “Strongly Agree”, and two responded “Disagree”. Five out of 14 people is only 36 percent, meaning 64 percent of people indicated one of the other responses. Pie charts of each individual question can be found in Appendix-F.

Figure 7.4: Data Spread Per Question (Example: Sidewalk Question #5)



According to the survey, sidewalks were in poor condition with most volunteers agreeing the width of the sidewalks is too small, cracks are too large, and the slope is too steep. In general, ramp questions have an even split on responses, meaning most people do not share the same opinion about ramp condition. Volunteers stated that doors are in the best condition with most people agreeing automatic doors work properly, and hardware is mounted at an accessible height.

Sidewalk

According to the survey, protruding objects are not an issue, but cracks are. These were every similar to the checklist responses. The path is not free of steps and stairs, there is not plenty of room to pass people, and the slope of the sidewalks are too steep; all of these are not consistent with the audit.

Most sidewalk questions have a fairly even split between responses. Question #3, however, has the largest rate of consistency with 50 percent of all responses being “Very Good”. This question has a small variability with 93 percent of volunteers saying protruding objects were not a problem. This is very consistent with the checklist (sidewalk questions #6, and #7) stating protruding objects are not usually an issue.

Also, 36 percent of people who answered question #4: “there were cracks or large gaps that provided difficulty to maneuver” said that cracks and gaps were a major issue. This was the most common choice. However, 50 percent of respondents agree that cracks and large gaps were not an issue. Thus the opinion is split on this issue. It is clear that the majority choice does not

show the range of responses. This is similar to the checklist, there is an even split between whether sidewalks are in compliance with ADAAG and free of cracks and gaps.

Even though the protruding objects and cracks are consistent responses between the checklist and survey, the passing area, accessibility, and slope are not. Overall, sidewalk responses were the least consistent with the audit.

Ramp

When reviewing the analysis, it is important to note that only nine of the 15 buildings visited by people during the activity have a ramp. This seems low at first, but in actuality is a higher percentage than the 35 percent of buildings with ramps out of the total of buildings analyzed in the audit. In general, participants agreed that railings were in good condition and were at an accessible height. The participants felt ramps were too steep according to the survey. However, the audit demonstrates that the ramps are compliant with ADAAG. Landings were considered large enough according to the survey responses. Students in the focus group thought that the landings were not large enough and the audit revealed that the landings often do not meet code.

Many ramp questions have a nearly even split between responses. Ramp question #9: “railings were at an accessible height” is nearly equally split on meaning few people share the same opinion. However, ramp questions #5-free of protruding obstacles, #6-cracks and gaps, and #12-railings secure to hold weight, have nearly half of the people agreeing on a condition being “Very Good”.

The strongest consensus on anyone item (with 55 percent) was on the slope. Participants agreed that the ramps are too steep. When comparing this to the audit results (checklist questions #4 and #5), and found that ramp slopes meet code, clearly the code requirements still make access difficult for people in wheelchairs.

Participants also agreed that landings do have enough room to maneuver (65 percent). This is contrary to discussions about landings at the focus group. This is also the opposite of the audit findings. According to the audit, not a single building meets code of having a large enough landing when a ramp changes direction. Even though the landings are not code compliant, the participants did not have any issues navigating them.

According to the survey railings are at a good height, ramps are too steep, and landings are large enough. Overall, ramps were non-conclusive on being consistent with the focus group or audit.

Door

Most door questions have a fairly constant response. However, none of these cases have more than fifty percent of people agreeing on the same opinion. According to the survey, volunteers agree that non-automatic doors are not easy to open and are too heavy, however, contrary to the focus group, volunteers said doors are open long enough. Participants disagreed that the door widths were wide enough while the audit demonstrates that they are not compliant.

Fifty percent of people agree that non-automatic doors are difficult to open when seated in a wheelchair. Because of this, automatic doors were preferred. Checklist door question #16 is directly related to door weight. The ADAAG says doors must take less than 50 pounds to open. All doors meet code, but the survey responses state the doors are too heavy. Thus the regulation of a maximum of 50 pound force to open the door is too high according to the survey responses.

Sixty-five percent of participants are in agreement that automatic doors were open long enough to get through. This result is surprising because of focus group participants thought them too short. When measuring the door timings for the audit, I thought they were very short although most doors meet code compliance related to door timings. The differences may be related to the abilities of the people in wheelchairs and the additional items that must pass through the door such as backpacks or guide dogs.

Thirty percent of respondents stated the door width was too narrow. However, 57 percent of volunteers stated that the door width is sufficient. This question is directly related to the audit. Most structures did not meet code compliance for a door width of 32 inches. The survey results are relatively spread out, so a significant consensus cannot be determined.

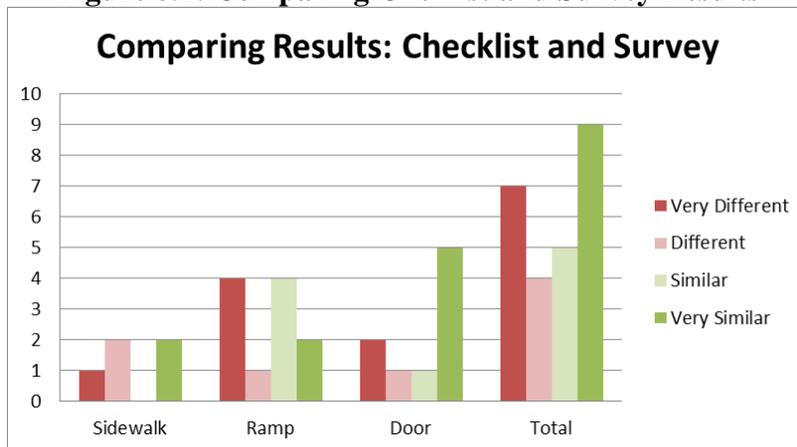
Chapter 8 - Discussion

Conclusion of Study

After analyzing the results of the checklist and survey, this section compares the consistency of the findings. Each of the twenty-five survey questions had at least one checklist question related to it. A comprehensive list comparing survey questions to checklist questions is found in Appendix-F. I compared the results of the checklist and survey by looking at the general trend of checklist compliance and survey opinion. Then I compared the number of structures in compliance to the percentage of people sharing the same opinion. The results of the analysis can be found in Figure 8.1, a detailed comparison by question is provided in Appendix-F. When only looking at the total, the checklist and survey results were both “Very Similar” and “Very Different”. The highest category was nine questions being “Very Similar”. The overall trend is almost 60:40 with fifty-seven percent of questions being “Very Similar/Similar” versus forty-four percent of questions being “Different/Very Different”.

I then graphed the results per element. I found that the total was both similar and different at the same time because the differing results per element. The sidewalk results were different, the ramp results were non-conclusive, and the door results were similar. This means that sidewalks meet code, but people do not find them accessible. Because ramps are not always needed, it made the checklist and survey difficult to compare. The analysis does not result in a clear “Similar” or “Different” result, therefore the comparison is non-conclusive. Doors were in the best condition on the checklist, and most people felt they were in good conditions.

Figure 8.1: Comparing Checklist and Survey Results



Sidwalks

Sidwalks are sixty percent “Different/Very Different”, which means compliance vs convenience are different. There were sixty-six percent of sidewalks in compliance on the audit, while there were sixty percent of survey responses claiming sidewalks are in “Bad” condition. For example, sidewalk width meets code, but survey responses say it is not wide enough. Thus compliance and convenience are very different for sidewalks.

Ramps

Ramps are almost evenly split with forty-five percent of questions being “Different/Very Different” while fifty-four of questions are “Similar/Very Similar”. This means the code compliance and survey opinions are the same half the time. This could be because not all structures need a ramp, and not all structures were visited on the survey. This could skew the results. The survey response from the seventeen buildings visited was compared to the audit for all forty buildings. The seventeen buildings visited for the survey are not a good sample of the forty buildings tested for compliance. Some questions were “Very Similar”, while others are “Very Different”. This means ramp compliance and ramp opinion are different dependant on a specific question. For example, both the checklist and survey say cracks are a problem, while landing size did not meet code but is not perceived as an issue. Thus the difference between compliance and convenience is non-conclusive for ramps.

Doors

Doors are sixty-seven 67 percent “Similar/Very Similar”. Five of the nine questions have “Very Similar” results. This is very consistent with the checklist and survey ratios. Sixty-three percent of doors meet code while seventy percent of survey responses find doors in good condition. This means doors meet code, and people find them accessible. For example, most door thresholds are compliant, and people do not have a problem with them. Thus compliance and convenience are very similar for doors.

In summary, sidewalks meet compliance but survey responses say they are in bad condition. The ramps comparison was non-conclusive. Doors are compliant and user-friendly.

Leasure Hall Example

Would you rather pull open the heavy door in front of you or use the farther entrance that has an automatic button? One of the comments on a survey responses is that Leasure Hall has heavy doors. After relooking at the audit results, it was found that Leasure Hall meets all door codes except threshold. The door weight meets code even though a respondent stated on their survey that the door was heavy. Therefore there is a disconnect between convenience (opinion of being too heavy) and compliance (weight meeting code). After further analysis, it was discovered that the main entrance to Leasure is deceptively handicapped accessible. There is no need for a ramp, however, a handicapped decal points to the door on the north side of the building. Figure 8.2 is a photos of the handicapped access door. Although this door is farther away, it does have an automatic button. If the student filling out the survey went around to this door they would not have to be concerned about a heavy door. Doing this, however, makes the student go out of their way; is that really convenient? I argue that it is not very user-friendly.

Figure 8.2: Leasure Hall



Connection to Planning in Practice

From comparing the consistency of checklist compliance and survey opinion, it can be determined what components of the ADAAG are actually working. From this analysis I recommend the following. First off, buildings should be put into compliance, and audits should be done more often. Next, if an issue does arise again, students should be able to complain. Students need to be educated about what can be addressed and by whom. Nothing will happen if people are not held accountable for their actions. A policy should be adopted by the City of Manhattan to avoid breaking the chain of accountability. Therefore Planning and Facilities Management reports to KSU, who answers to the City of Manhattan, then State of Kansas, then the USA government. This study has some limitation that can be addressed by performing future studies on this subject. The three main ideas are expanding the research sample, comparing results to age of building and topography, and analyzing whether blind bumps and service animals are causing an issue. This section will explain what needs to be put into code compliance, when to perform audits, how to make a complaint, who is to be held accountable, and future studies to be done by planners.

Code Compliance

Because none of the forty structures assessed meets all ADA guidelines, I first recommend improving all forty structures by bringing them up to code compliance. I recommend doing this in phases starting with the few structures that are mostly non-compliant. This addresses the major access issues right away. Then, I recommend making the minor alterations needed to bring the buildings into compliance that are very close (those with only one or two requirements not in compliance). While making corrections, survey opinions should be taken into account. In general, any time a new structure is built or another structure is remodeled, disability access should be considered.

Sidewalk: Thirty-eight structures are mostly in compliance, except for King Hall (more “No” than “Yes”) and Cardwell Hall (tie of “Yes” and “No”). These two structures should be the first to bring up to code. These two structures should at least have minor improvements to make the structures mostly in compliance. Sixteen structures (see Table 5.1 and D.2) have only

one or two items not in compliance. This means they are very close to being fully compliant and a minor change could bring these structures up to compliance.

The sidewalk question with the most compliance is #2, which means most sidewalks are located in a good location. The problem lies in the maintenance of them. The main issue is cracks, so the easiest way to fix this issue is to caulk/patch the holes or lay new concrete sidewalks in Phase 1. According to the survey, the widths of the sidewalks are too small. Phase 2 should occur whenever a new sidewalk is constructed or an old one is re-laid, it should be widened.

Ramp: Sixty-five percent of structures do not need a ramp. This means they are inapplicable for compliance on these criteria. Thus, there are only fourteen of the forty buildings that should be fixed. For the ramps not located near the door, it would be difficult to move them without re-altering the building's architecture. Whenever a structure goes through a remodel, the new design should accommodate disability access near the main entrance.

Calvin Hall has the only ramp in "Bad" condition (more "No" than "Yes"). This ramp could be patched at the very least to fix minor issues. According to the survey, however, cracks are not a major issue. The only way to completely fix the Calvin ramp would be to re-level the landings and fix the slope. The worst issue (checklist ramp question #13) is the size of landings when the ramp changes. The only way to fix this would be to re-build the whole ramp. However, according to the survey, the landing size is not an issue. With this knowledge, the ramps with cracks or landing size as the only issues should be fixed in later phases.

The ramp question with the most compliance is #22, meaning handrails are usually fixed so they do not rotate. In general handrails are in compliance, but any time they are not in compliance, they can easily be added. It is easier to add a compliant handrail than it is to re-build a whole ramp. However, handrails went unnoticed on the survey, so they are not a major issue. I recommend spending more money and effort fixing the slopes of the ramps instead of focusing on handrails because the slope was the worst quality of the ramp according to the survey. Thus fixing ramp slope should be the first phase of ramp improvement.

Door: The doors at the K-State Student Union and Weber Hall meet all codes for doors, so these two structures can be a good precedent for other buildings. Fifteen buildings have 1 or

2 items not in compliance (see Table 5.1 and E.4). This means they are very close to being fully compliant and a minor change could bring these structures up to compliance.

The questions #9, #12, #16, and #18 are in the best condition. All of the buildings have these questions completely compliant. This means exterior handles are operable with one hand (#9), exterior handles are at a good height (#12), doors are light enough (#16), and automatically open fast enough (#18). However, the survey states that the doors are too heavy. For the first phase, the twelve doors that are not automatic should be switched out for lighter doors or made automatic.

Even though the exterior handles meet code, the interior handles cause an issue. The worst door question is #5 (the doorway should have a thirty-two inch clear opening) is “No” on twenty-four of the buildings. This issue can easily be fixed by switching out the interior door hardware. The doorway is thirty-two inches wide, but the hardware obstructs the pathway. According to the survey, most people agree that there is not enough room to fit through doors. If the interior hardware is changed, then the item will be compliant. This is a quick fix for the second phase.

The most issues are with a level area outside of the door and the steepness of the threshold. According to the survey, the level area is a problem so it should be fixed. The threshold, however, is not considered too steep. Thus, the door way itself does not need to be altered right away. The focus of the third phase should be fixing the area right outside the door and making it level.

Audits

It is great to bring the structures into compliance, but unless Facilities Management maintains the infrastructure they will deteriorate again. Facilities Management can keep up on maintenance by doing audits more frequently to find where the issues are located. Waiting twenty-two years (since 1992 audit) to do another review is not a respectable time line.

This study only focused on the entrance sequence (sidewalk, ramp, and door). An audit of the interior of the buildings should be performed next. The main issue volunteers voiced was problems with toilet access. In order for these buildings to be fully compliant, the interior should be taken into account. This study only focused on the forty academic buildings. In order to do a fully comprehensive audit, all structures on Kansas State University campus

should be analyzed. This can be done in phases, over time. In general, these structures should be examined more regularly.

Complaint Venue

Disability access is only checked on a complaint basis. This means any student at Kansas State University that feels there is an issue needs to speak up. The Student Access Center provides information about who to contact. According to the Student Access Center grievance process page, “students are encouraged to discuss their concerns with a staff member. Student Access Center staff will attempt to resolve the issue by assisting the student in discussions with the faculty member, department, or program” (Student Access, 2014, para. 1). If a satisfactory resolution is not reached, the student should notify the Office of Affirmative Action where grievance procedures are filed for all students, including students with disabilities.

There is currently a tool in place to file complaints. The issue however, is that students may not know that they need to voice a complaint to get the issue resolved. The students need to be educated about who to contact and how to complain about an issue.

Policies

Currently there is no clear accountability to have buildings be ADAAG code compliance. Even if Campus Planning and Facilities Management does not follow ADAAG, they should follow their own regulations in *2013 Design and Construction Administration Specification Standards*. However, if they do not, they are held responsible to the university president. The president will only worry about this if he finds disability access to be an issue. The 2050 Master Plan is the president’s guide to making his decisions about campus. As discussed earlier in this document, this campus plan does not have anything about disability access. Therefore he may not require compliance. The City of Manhattan has zoned KSU to University, and under the current city ordinance this gives all responsibility back to the university. Thus, the City of Manhattan is not a resource for accountability.

I recommend the City of Manhattan generate a policy that gives them more control of KSU. This policy would insure that the chain of accountability not be broken. The City of Manhattan answers to the State of Kansas, who is then under the United States of America Government.

Future Studies

This study had some limitations, but there is an opportunity to combat these limitations in future studies. Expanding research samples and comparing results are easy ways to continue examining this topic.

The focus group was made up of only forty percent of the disabled students on campus. Talking with more students could be beneficial. The blind bumps discussed in the focus group could be pursued as another research study. The study would focus on comparing how blind bumps help the blind but hinder those in wheelchairs. Service animals were also discussed at the focus group. The ADAAG is based on the wheelchair size, but having a service animal was not considered. An investigation could be done to see if the specific restrictions are compatible with service animals. The checklist analysis could be continued by comparing the compliance results to the date of construction for each building. A topography analysis can be done to see bigger connections on campus and whether getting around campus is user-friendly. The survey studied perception of students, but only asked fourteen people. Expanding the sample would be valuable. The volunteers on the survey only visited forty-three buildings, so it would be advantageous to expand the number of buildings examined.

In summary, studies can be done by asking more students to discuss issues in a focus group or fill out a survey. Comparing results to building age and campus topography can expand understanding of the status at KSU. Lastly, a study of blind bumps and service animals can be done to measure how well the ADAAG is working.

Connection to Planning Theory

This study proves as a good example of research methodology, communicative planning, and advocacy planning. The examination of disability access enhances the planning theory of creating social justice. This analysis also continues the discussion of defining planning and a planner's role in society.

This study uses three different types of methodology. By using the focus group, checklist, and survey, reviewers can compare results and clarify constancy of data. According to Reid Wing, both doing a quantitative and qualitative analysis can be useful (Reid, 2013). Reid states that triangulation, or the use of multiple methodologies to double-check results, was

first advocated by Todd Jick of Cornell University. Jick wrote in an article in 1978, that the agreement between these methods increases our confidence that the results are valid.

“Mixed methods research, which dates back to the 1970s, has become increasingly popular since the SAGE Handbook of Mixed Methods in Social and Behavioral Research came out in 2003, followed in 2007 by the first issue of the quarterly Journal of Mixed Methods Research. According to the handbook’s second edition, mixed methods zoomed from 23 in 1997 to 718 a decade later.” (Reid, 2013, p. 46)

This study properly uses multiple methods to discover an understanding of disability access. This study can be used as an example of when mixing methods would be useful.

The focus group and survey were the two methods used on this study to gather public perspective. It is through these venues that knowledge was communicated from the students to me. The study is then given to the Planning and Facilities Management at Kansas State University. Thus the student’s concerns will be given to the group who can make a change. Planners usually do this by gathering public opinion through public engagement and then communicating the results to the governing body. This study demonstrates an example of how communicative planning can be harnessed to make sure the constituents have a venue to voice their opinion and so the proper entities receive this information. The importance of communicative planning is fairly accepted in the planning community. This study demonstrates that when planners get involved, they help people come together and discuss their issues. As discussed in Planning, Theory, Ethics, and Practice, planners are important because they get the right people talking to each other (Brody, 2014). If this study was not conducted, it is unforeseeable when or if these groups would ever communicate.

This study addresses public participation by having disabled students converse with one another about their issues with access. This group discussion, or focus group, allows students to feed off of each other and gain perspective on what other students may also struggle with. This discussion allowed me to more fully understand the problems these students face on a daily basis. It is through communication I can gather the public perception of disability access.

According to Thomas, the idea that planners should focus on is providing planning services to powerless groups (Sanyal et al., 2012). This study is a good example of advocacy planning. The disabled students on campus are in such low numbers that they need someone to speak out on their behalf. When planners find an issue that needs addressing, they should help

speak up on behalf of those that cannot. The results of this study are giving a voice to the students who are currently pushed aside and forgotten.

As the discussion of social justice continues, this study adds to the knowledge of disability access. The main concern with social justice used to be racial issues. The focus moved to gender, and now physical ability. This study concludes that code compliance does not mean the structure is accessible. The study adds to the idea of making buildings accessible for all and therefore creating social justice.

The discussion of social justice adheres to the idea that planners are accountable to the public needs. As planners advocate for social justice they are hoping to make buildings accessible. The main question still stands, however, whether accessibility is really a planner's problem. Who are planners accountable to? As explained above, I argue that planners are accountable to the general public and therefore should advocate for social justice. Disability access and similar information could be addressed in the city's comprehensive plan in the access and transportation section. Disability access is something that can easily be molded into the job description of planners. This study helps develop what a planner is and what they should do.

It is through this study that research methods were properly utilized to create a cohesive study. Communicative planning was used to help define what it is people wanted or needed. The results of the study are being shared as a way to advocate for those with a disability. This study hopes to communicate that code compliance and user convenience are not the same thing. Understanding this idea expands to the concept of creating social justice. This study proves that planners can and should advocate for those in need. The analysis of this study adds to the discussion on understanding and defining the planner's place in society.

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Appendix A - Wheelchairs

The earliest recorded wheelchair was used in China during 525 BC. The first knowledge of wheelchairs, as we know them, dates to the 1500s in Spain. The first self-propelled wheelchair was made in 1655 by a watchmaker. The cog wheel device was common in 1677. The 18th century started the design of two large back wheels and one small front wheel. Iron wheels were introduced in the 19th century. Powered chairs were being used starting in the early 1900s (Cooper, 2007, p. 131). The ADAAG guidelines, as well as the State University Construction Fund (Cotler and DeGraff, 9) use the manual wheelchair measurements to base the codes on. Only those people with a disability that have upper-body strength can use manual wheelchairs (Cooper, 2007, p. 131). This means that anyone using a power chair may have issues accessing facilities because manual and power chairs are not necessarily the same size. Power wheelchairs also have different sizes depending on the user's needs. The wheels can be made out of rubber, plastic, pneumatic, or a combination.

Appendix B - Annotated Bibliography

The U.S. Architectural and Transportation Barriers Compliance Board (Access Board) is in charge of enforcing the ABA, and later the ADA. According to *Access America* and *Access Current* periodicals from 1989-95 and 1998-99 respectively, research was constantly being done to make sure the ADA codes would be accurate. *Access America* was a great resource for people of the time to be updated on what step the Access Board was at in preparing the ADA and ADAAG.

Architectural Accessibility for the Disabled of College Campuses was written by Stephan R. Cotler (Architect with the Construction Fund), and Alfred H. DeGraff (Administrator for Disabled Student Services at Boston University) in October of 1976. It is compiled of multiple resources all condensed into one document. It focuses on the regulations in general terms. These two people utilized personal experience of being handicapped and their professional interest obtained from both graduate degrees and administrative experience in educational administration. Manufactures assisted in providing basic research data. This document provides rationale of why the numbers are what they are. This document is organized by topic, example: Ramps.

Technical Paper on Accessibility Codes and Standards: A Comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities was written by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board) in July of 1989. This document provides a great resource that compares the UFAS, ANSI 1986, ANSI 1980, ANSI 1961, and UBC. It then compares the UFAS with any inconsistencies in State codes. The last section of the text compares the UFAS (the United States) to other countries. This resource is organized by topic/UFAS paragraphs, example: UFAS Paragraph 4.13. Doors.

Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities was written by the Department of Administrations DIVISION OF FACILITIES MANAGEMENT February of 1993. This document is a nice checklist of what someone should look for during an inspection to see if a structure meets ADAAG regulations. This document was found in the Kansas Documents as a resource for all Kansas

developers to check if their structures are compliant. Each of the points has a Yes, No, and NA box to check off whether the structure follows a certain code of the ADAAG. This is a great resource as a starting point to make my audit on whether Kansas State University buildings are in code. This resource is organized by topic, example: Pathways.

Laws Concerning the Access Board: Architectural Barriers Act of 1968 (ABA); Section 502 of the Rehabilitation Act of 1973; Americans with Disabilities Act of 1990 (ADA) was written by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board) in May of 1994. This document lists out the responsibilities of the Access Board. The Access Board plays an important role in ADA regulations, so it is essential to know what their rules are. "...the Access Board is responsible for developing accessibility guidelines for entities covered by the Act and for providing technical assistance to individuals and organizations on the removal of architectural, transportation, and communication barriers. These three laws [ABA, Section 502, and ADA] form the basis for building an accessible environment for all people" (Access Board 1). This document is organized by section, example: Section 504 of the Americans with Disabilities Act of 1990.

Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) was updated by the U.S. Access Board in September of 1998. This document shows the changes that were made from the previous edit. This is helpful when seeing how the rules have changed over the years. Most of the edits are used to clarify or simplify what was written. Some sections were added, for example: Security Systems (71); Judicial, Legislative, and Regulatory Facilities (72). This document is organized by topic, example: 4.3-Accessible Route.

Accessible Rights-of-Way (Sidewalks, Street Crossings, Other Pedestrian Facilities): A Design Guide was written by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board) in November of 1999. While the ADAAG has regulations on Buildings and Facilities, this document focuses on more specific details about the area on the exterior of the structure (right-of-way). This document provides useful, relevant information on sidewalk restrictions and curb ramps, as well as further details on pedestrian street crossings, street furniture, and temporary facilities. Everything is written to provide disabled people access to these locations. This document is organized by topic, example: Sidewalks.

Appendix C – Specific Regulations

Table C.1: Regulations Pertaining to Sidewalks

Title	Information Found (page number)
Architectural Accessibility for the Disabled of College Campuses	gradient of 1:20=5%; cross gradient no greater than 1 in 100 (13)
	6ft width when no curb cutouts necessary (13)
	4ft width plus 1ft for each 1in of curb height (13)
	6inX6in when meeting a doorway (13)
	max of 1/2 inch opening; max of 1/4 inch in grating change (13)
	surface must be consistent without abrupt pitches in angle or interruption by cracks or breaks creating edges of 1/2inch or more in height (13) or 3/8inch in width (75)
	surface must me firm, even, and "nonslip" in either dry or wet conditions (75)
Technical Paper on Accessibility Codes and Standards: A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities	USFA requires an accessible route connecting accessible buildings, spaces, and elements, prohibits protruding objects in circulation paths, requires complying ground and floor surfaces, and complying stairs. (24) State rules are expressly or implicitly the same (25)
	USFA 4.3 Accessible Route: general, location, width, passing space, headroom, surface texture, changes in levels, doors, egress (46-47)
	ANSI 1986: same as UFAS except no scoping provision and last two sentences of 4.3.10 not included (47)
	ANSI 1980: same as 1986 (47)
	ANSI 1961: no provision (47)
	UBC: ramps required for elevation change (47)
Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities	Pathways: 4.3.2, 4.3.3, 4.3.4, 4.3.7, 4.3.8, 4.4.1, 4.4.2, 4.5.1, 4.5.2, 4.5.4, 4.7.1, 4.7.2, 4.7.3, 4.7.5, 4.7.6, 4.7.8, 4.7.9, 4.7.10, 4.7.11, 4.30.2, 4.30.4, 4.30.5 (11-14)
Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)	4.3-Accessible Route (15-20), 4.4-Protruding Objects (21), 4.5- Ground and Floor Surfaces (22-23), 4.7- Curb Ramps (26), 4.30- Signage (53)
Accessible Rights-of-Way (Sidewalks, Street Crossings, Other Pedestrian Facilities): A Design Guide	36 inch walkway width is minimum needed for accessible travel (34); 32 inch at a point (35)
	more room is needed when turns are necessary, 60 inch diameter---Wheelchair width is 30 in, and length is 48 (35)
	Wheelchair width is 30 in, needs 60 inches for pedestrians to pass each other (35)
	1:12=5% maximum slope specified in accessibility standards for ramps (37)
	If a sidewalk exceeds 8ft, an exterior access ramp parallel to the building façade may be added to provide an accessible entrance (42)
	Sidewalk cross slope should be limited to 1:48=2% (45)
	wheelchair needs a planar surface for travel---if a wheel loses contact stability is at risk (46)
	Sidewalks and shared-use paths should meet the stable, firm, and slip-resistance criteria established in accessibility standards (47)
	1/2 inch maximum gratings/gaps in direction of travel---if wheel gets caught, forward progression will cause person to be flown from seat (47)
	Transitions in adjoining surfaces should be less than 1/4 inches in elevation---case wheels to swivel (28); if beveled at 1:2, a 1/2 inch elevation difference is permitted (51)

Table C.2: Regulations Pertaining to Ramps

Title	Information Found (page number)
Architectural Accessibility for the Disabled of College Campuses	slopes=1inch height: 1:12; 2inch height: 1:4; 3inch height: 1:6 (19)
	4ft width required (19)
	Longest slope length 30ft; after each 30ft a level area of 6ft required (19)
	top and bottom landing must be 6ft long (19)
	weather conditions: ramp should be protected from the elements by an overhang and/or walls (21)
Technical Paper on Accessibility Codes and Standards: A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities	UFAS 4.8 Ramps: general, slope and rise, clear width, landings, handrails (53-54)
	1986 ANSI: does not include UFAS 4.8.5, 6, and 7 (handrail restrictions) (54)
	BOCA: the only ANSI 1986 standard not accepted is ramp slope; uses ANSI standard for renovation as general standard (54)
	1980 ANSI: handrail height not clearly specified (54)
	1961 ANSI: landing on top is 60inx60in; landing extends 12 inches beyond each side of the doorway; 72 inch clearance at bottom of ramp; ramp requires landings every 30ft and level turns (54)
	UBC: may have a slope of 1:12; landings and handrails not required unless slope is greater than 1:15, if 1:15 landing must be every 5ft of rise; landings must be 24in beyond the latch edge of doors swinging over the landing; minimum of 60 inch parallel to the direction of travel (54)
Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities	Ramps: 4.5.4, 4.8.2, 4.8.3, 4.8.4, 4.8.5, 4.8.6, 4.8.7, 4.8.8, 4.26.2 (15-16)
Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)	4.5- Ground and Floor Surfaces (22-23), 4.8- Ramps (27-30), 4.26- Handrails (50)
Accessible Rights-of-Way (Sidewalks, Street Crossings, Other Pedestrian Facilities): A Design Guide	1:12=5% maximum slope specified in accessibility standards for ramps (37)
	If a sidewalk exceeds 8ft, an exterior access ramp parallel to the building façade may be added to provide an accessible entrance (42)
	Curb Ramp is basic unit of accessibility in a pedestrian circulation network (56)
	Different types of curved ramps: perpendicular, parallel, combined (60-62)
	Curb ramp run is a function of curb height (68)
	Be aware of radius of diagonal curb ramps--small radius requires pedestrian in wheelchair to enter traffic lanes, large radius requires additional sidewalk space (74)
	1:10=10% slope permitted for a distance of 6 inch rise if 1:12 is not feasible. For a 3 inch rise, maximum slope of 1:8. Historically significant facilities: 1:6 and 24 inch run acceptable. (75)
	Landing spaces function as turning space when entering or leaving a ramp (84); 48 inches needed (83)

Table C.3: Regulations Pertaining to Doors

Title	Information (page number)
Architectural Accessibility for the Disabled of College Campuses	Doors: minimum door width shall be 34 in (31)
	Height of threshold shall not exceed 1/2in; flush would be best (31)
	glazing corridor starting 3 ft from floor up to 6ft high; width of 6-8inches---used for safety (31)
	closing devise pressure on an exterior door shat not be set above 8lb (33)
	recommended types: air curtain, power operated sliding door, balanced door (33)
	Area between doors shall be at least 7ft-6in---provides maneuvering space for a wheelchair (33)
Technical Paper on Accessibility Codes and Standards: A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities	UFAS: Requires "at least one" scoping for doors at entrances and at each accessible space, and "all" scoping where these elements are on accessible routes (25)
	UFAS 4.13 Doors: general, revolving doors and turnstiles, gates, double-leaf doorways, clear width, maneuvering clearances at door, two doors in series, thresholds at doorways, door hardware, door closers, door opening forces, automatic doors and power-assisted doors (62-65)
	ANSI 1986: not explicit on having a accessible gate or door near a revolving door; ANSI permits door hardware as high as 54in but UFAS mas is 48in; UFAS has no requirement on max force for exterior hinged doors but ANSI prescribes 8.5 pounds-force (65)
	1980 ANSI: same as 1986 except for clarification in 4.13.4 (65)
	1961 ANSI: min of 32in opening; 60in of level space on inside and outside in 5.3.1-3 (65)
	UBC: minimum clear opening is 32in; threshold must be 1/2in or less; landings must be as wide as the door (65)
Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities	Doors and Gates: 4.13.2, 4.13.3, 4.13.4, 4.13.5, 4.13.6, 4.13.7, 4.13.8, 4.13.9, 4.13.10, 4.13.11 (19-20)
Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)	4.13- Doors (36-39)

Table C.4: Regulations Pertaining to Entrances

Title	Information (page number)
Architectural Accessibility for the Disabled of College Campuses	Entrances: at least one primary accessible entrance within 200ft of parking facilities (29)
	overhangs would be provided over all entrances that are used by the physically handicapped (29)
Technical Paper on Accessibility Codes and Standards: A comparison of Domestic and Selected Foreign Standards and Codes for Accessible Facilities	UFAS: Requires "at least one" scoping for doors at entrances and at each accessible space, and "all" scoping where these elements are on accessible routes (25)
	UFAS 4.14 Entrances: minimum number, service entrances (66)
	1986 ANSI: Same as UFAS (76)
	1980 ANSI: Same as UFAS, but requires at least one accessible entrance (67)
	1961 ANSI: requires at least one accessible entrance to each building and to elevator level (67)
	UBC: similar to 1961 ANSI; applicable to most all occupancies (67)
Americans with Disabilities Act Accessibility Guidelines (ADAAG): Check List for Compliance for Buildings and Facilities	Entrances: 4.3.8, 4.13.2, 4.13.3, 4.14.1, 4.14.2 (17)
Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG)	4.3-Accessible Route (15-20), 4.13- Doors (36-39), 4:14- Entrances (40)

Appendix D - Focus Group Samples

Figure D.1: Flier to Get Volunteers

Compliant
vs
Convenient

Is Kansas State University Campus truly user friendly for persons with physical disabilities?

WHO Any KSU students with a physical disability

WHAT Participate in an hour long focus group

WHEN After Thanksgiving break, Fall 2012
(Week of December 3rd: Exact time and location will be decided based on volunteer's schedules)

WHY Share your experiences and make your voice heard!

HOW See attached letter for more information
If you are interested please contact Ashley Klingler by November 29th at klingler@ksu.edu.

Figure D.2: Letter of IRB Approval

KANSAS STATE UNIVERSITY	University Research Compliance Office
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TO: John Keller
Landscape Arch & Planning
301 Seaton

Proposal Number: 6435

FROM: Rick Scheidt, Chair 
Committee on Research Involving Human Subjects

DATE: 11/08/2012

RE: Proposal Entitled, "Is Kansas State University ADA accessible/convenient?"

The Committee on Research Involving Human Subjects / Institutional Review Board (IRB) for Kansas State University has reviewed the proposal identified above and has determined that it is EXEMPT from further IRB review. This exemption applies only to the proposal - as written - and currently on file with the IRB. Any change potentially affecting human subjects must be approved by the IRB prior to implementation and may disqualify the proposal from exemption.

Based upon information provided to the IRB, this activity is exempt under the criteria set forth in the Federal Policy for the Protection of Human Subjects, **45 CFR §46.101, paragraph b, category: 2, subsection: ii.**

Certain research is exempt from the requirements of HHS/OHRP regulations. A determination that research is exempt does not imply that investigators have no ethical responsibilities to subjects in such research; it means only that the regulatory requirements related to IRB review, informed consent, and assurance of compliance do not apply to the research.

Any unanticipated problems involving risk to subjects or to others must be reported immediately to the Chair of the Committee on Research Involving Human Subjects, the University Research Compliance Office, and if the subjects are KSU students, to the Director of the Student Health Center.

Figure D.3: Consent Form

KANSAS STATE UNIVERSITY- INFORMED CONSENT TEMPLATE	
PROJECT TITLE:	Compliant Vs Convenient- Is the Kansas State University Manhattan, Kansas Campus Accessible for Physically Disabled Persons?
APPROVAL DATE OF PROJECT: <u>11/08/2012</u>	EXPIRATION DATE OF PROJECT: _____
PRINCIPAL INVESTIGATOR: CO-INVESTIGATOR(S):	<u>John Keller</u>
CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS:	Ashley Klingler (Graduate Student): Klingler@ksu.edu/248-978-5874 John Keller (Major Professor): jwkplan@ksu.edu
IRB CHAIR CONTACT/PHONE INFORMATION:	Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224. Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.
SPONSOR OF PROJECT:	<u>Not Applicable</u>
PURPOSE OF THE RESEARCH:	THIS STUDY: Ashley Klingler is studying Access for Disabled Persons for her Graduate Thesis project. Klingler plans to test if the Kansas State University Campus in Manhattan, KS is code compliant (follows the law) and if it is convenient (user-friendly). As a student without a disability, Klingler does not know all of the issues a person with a physical disability deals with. This focus group (made up of students with disabilities attending KSU) will assist her in understanding what major issues the code does not focus on, or that KSU just does not implement.
PROCEDURES OR METHODS TO BE USED:	BACKGROUND/CONTEXT: This project has multiple parts. (2A) Klingler plans to make a checklist to test whether campus is ADA accessible. Klingler will personally examine campus and test whether each building complies with ADA code as well as test convenience. (2B) Klingler also plans to conduct a survey to gather public perception of ADA restrictions and whether campus is truly user-friendly. This survey will be given before and after an activity where students will go around campus attempting to perform a task. Klingler will test and compare both disabled students and non-disabled students (1) Before Klingler does this she wants to conduct a focus group and gather information about what students find as issues about user-friendly access. From their comments Klingler will create the proper checklist (2A) and survey (2B). Part 2 will be organized after the focus group. THIS STUDY: This focus group (Part 1) will be an informal discussion where students with a physical disability from Kansas State University can discuss and explain some issues about accessibility on campus. A fellow graduate student will be taking hand written notes of the discussion. No one will be quoted unless specifically asked. This study will not be filmed or recorded.
LENGTH OF STUDY:	This focus group will consist of a general background and context lecture (5 min) to explain the study. The discussion itself will probably last 1 to 2 hours-depending on the desire of the students to continue sharing information. I am welcome to leave early for any reason.
RISKS ANTICIPATED:	Because this study asks about my personal experiences and issues with access, it requires personal examples and life experiences to be shared. Anything I do not feel comfortable sharing, I am not obligated to. This topic discusses issues with accessibility. If at any time I feel anxious or frustrated I am not obligated to continue with the discussion—I may leave if I feel uncomfortable).
BENEFITS ANTICIPATED:	By agreeing to do this focus group, I am assisting Klingler in creating an all-inclusive study. This will make sure that actual issues and concerns will be addressed. This is a chance for me to voice my concerns with accessibility on the KSU campus.
EXTENT OF CONFIDENTIALITY:	Personal contact information will not be shared. Nowhere in the published document will student names be used. Klingler will only use phrases like "The focus group was made up of twenty disabled students on KSU campus" "The general responses from the focus group are...". A list of students involved will not be shared in the thesis or otherwise documented. The only way this will change is if I personally requests to be quoted or requests to remain as a contact for anyone else doing a similar study. Only Ashley Klingler, Andrea Blair (the Director of Disability Support Services), Andy Thomason (fellow graduate student and the Note Taker), and possibly John Keller (Klingler's Major Professor) will know of the actual members of the focus group.
IS COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS:	<u>No more risk than any usual day.</u>
PARENTAL APPROVAL FOR MINORS:	<u>If I am a minor (under 18 years of age) and I wish to participate, parental permission is required.</u>
<p>TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled. By participating in Part 1 (this study: focus group) I understand that I am not agreeing to participate in Part 2 (survey/activity).</p> <p>I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form. (Remember that it is a requirement for the P.I. to maintain a signed and dated copy of the same consent form signed and kept by the participant)</p>	
Participant Name (Print):	_____
Participant Signature	_____ Date: _____
Witness to Signature: (project staff)	_____ Date: _____

Figure D.4: Questions

FOCUS GROUP OUTLINE- I hope to get 6-8 people

INTRODUCTION-SEE POWERPOINT

(ABOUT 5 MIN)

- Who I am/purpose
- Information about my study

STUDY

(1-2 HOURS DEPENDING ON STUDENT INTEREST; STUDENTS MAY LEAVE WHENEVER THEY WANT)

Background/Inventory (graduate student will take notes, these questions will not be asked):

- Number of people in: wheelchair-powered?/ crutches/ prosthetics/ blind
- Service Animal?
- Average age of students
- Genders represented

Focus Group Questions:

- What year are you at Kansas State University?
- Have you attended another University or College before?
- How long have you had a disability---Since Birth? Since a young age? Recently?
- Temporary versus permanent disability?
- What is most inconvenient about getting into buildings on campus?
- Any particular location on campus with major issues?
- Is weather an issue?
- Does a powered wheelchair make a difference?
- Does having a dog make things more difficult?
- Does having a backpack make things more difficult?
- Are bike riders or bike racks an issue?
- Are ramps located in convenient locations?
- Are some doors more difficult than others?

Appendix E - Checklist Samples

Table E.1: Questions

Sidewalks/Pathways	
1	Is there an accessible route linking public streets and sidewalks with the accessible building entrance?
2	Is the accessible pathway free of steps and stairs?
3	Is the accessible pathway at least 36 inches wide?
4	If the pathway is less than 60 inches wide, are there passing spaces at least 60 inches wide?
5	Is there at least 80 inches clear head room along the pathway?
6	Is there an object protruding more than 12 inches into the pathway?
7	If there is an object protruding into the pathway, is the path at least 36 inches wide?
8	Are accessible pathway surfaces stable, firm and slip-resistant?
9	Are the grating openings no more than 1/2 inches?
10	Are the grating openings perpendicular to the direction of travel?
11	Is the slope of the accessible pathway no greater than 1:20 (2.86 degrees)?
12	Is the cross slope of the accessible pathway no greater than 1:50 (1.146 degrees)?
13	Is the vertical difference between walkway levels equal to or less than 1/2 inch?
Ramps	
1	Is a ramp needed?
2	Is the ramp located near the main entrance?
3	If there is no ramp, is there a platform lift?
4	Is the ramp slope 1:12 (4.763 degrees) or less?
5	Is the cross slope of the ramp surface no greater than 1:50 (1.146 degrees)?
6	Is the ramp surface non-slip?
7	Are ramps designed so that water will not accumulate on walking surfaces?
8	Are the grating openings no more than 1/2 inches?
9	Are the grating openings perpendicular to the direction of travel?
10	Is the clear width of the ramp 36 inches or more?
11	Is there a level landing at the top and bottom of each run?
12	Is the landing at least as wide as the ramp and 60 inches long?
13	Where the ramp changes direction, is the landing at least 60 by 60 inches?
14	If a ramp landing has a drop off, does it have a 2 inch curb, a wall, railings or projecting surfaces which prevent people from falling off?
15	If the ramp rises more than 6 inches or is longer than 72 inches, does it have a handrail on each side?
16	On dogleg or switchback ramps, is the inside handrail continuous?
17	At ends of handrails, is there at least 12 inches of level handrail beyond the top and bottom of the ramp segment?
18	Are the end of the handrails rounded or returned smoothly to the floor, wall or post?
19	Is the top of the handrail between 34 to 38 inches above the ramp surface?
20	At wall mounted handrails, is there exactly 1 1/2 inches between the handrail and the wall?
21	Is the diameter of the handrail between 1 1/4 inches and 1 1/2 inches? OR Does the shape provide an equivalent gripping surface?
22	Are handrails fixed so that they do not rotate within their fittings?
23	Are the handrails capable of supporting 250 lbs?
Doors/Entrances	
1	Is the door protected by a canopy or roof overhang?
2	Swing or slide?
3	Ingress or egress?
4	If there are multiple doors in a series, do the doors swing in the same direction? OR do they swing away from the space in between?
5	Does the doorway provide a 32 inch clear opening width and maneuvering space?
6	Is the floor level and clear in the maneuvering space? (42 in x 54 in)
7	If there is a raised threshold, is it beveled at 1:2 (26.56 degrees) or less?
8	Is the threshold no higher than 1/2 inch?
9	Are all handles, locks, and latches operable with one hand?
10	Are all handles operable without tight pinching, tight grasping or twisting of the wrist?
11	Lever? Knob? Pull? Push Bar? Push Plate? Hospital Latch?
12	Is the hardware mounted no higher than 48 inches above floor level?
13	Is the door designed to be automatic?
14	How far is the door opener from the door?
15	How high is the door opener from the ground? (48 inches)
16	What force is required to open the door? (50 lb)
17	Does the automatic button actually work?
18	How long does it take to open? (min of 1.5 sec)
19	How long does the door remain open at 90 degrees position? (min of 5 sec)
20	If the door has a closer, does it take at least 3 seconds to move from 70 degrees open to a point 3 inches from the latch?

Table E.2: Sidewalk Results

Sidewalks/Pathways	1	2	3	4	5	6	7	8	9	10	11	12	13
Ackert Hall	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	Y	N
Bluemont Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	Y	Y	Y
Call Hall	Y	Y	Y	Y	N	Y	O	Y	N	Y	N	Y	N
Calvin Hall	Y	Y	Y	O	Y	Y	O	Y	N	Y	N	Y	Y
Campus Creek Complex	Y	Y	N	N	Y	N	Y	N	Y	N	N	Y	Y
Cardwell Hall	N	N	Y	Y	Y	Y	O	Y	N	N	N	N	Y
Chemistry/Biochemistry Building	Y	Y	Y	Y	Y	Y	O	Y	Y	N	Y	Y	Y
College Court Building	Y	Y	Y	N	N	Y	O	N	Y	N	Y	Y	Y
Dickens Hall	Y	Y	Y	O	Y	Y	O	Y	Y	Y	N	Y	Y
Dole Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	N	Y	Y
Durland Hall	Y	Y	Y	Y	Y	Y	O	N	N	N	Y	Y	N
East Stadium	Y	Y	Y	Y	Y	Y	O	Y	N	N	Y	Y	N
Eisenhower Hall	Y	Y	Y	O	Y	Y	O	Y	N	Y	N	N	Y
English/Counseling Services	Y	Y	Y	O	Y	Y	O	Y	N	Y	Y	Y	Y
Fairchild Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	N	N	Y
Fiedler Hall	Y	Y	Y	Y	Y	Y	O	Y	N	N	Y	N	Y
General Richard B. Myers Hall	Y	Y	Y	Y	Y	Y	O	Y	N	Y	Y	Y	Y
Hale Library	Y	Y	Y	O	Y	N	Y	N	N	Y	Y	N	N
Holton Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	Y	Y	N
Justin Hall	Y	Y	Y	Y	Y	Y	O	Y	N	N	Y	Y	N
K-State Student Union	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	N	Y
Kedzie Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	Y	Y	Y
King Hall	Y	Y	Y	O	Y	N	Y	N	N	N	N	N	N
Leadership Studies Building	N	Y	Y	Y	Y	N	Y	Y	Y	Y	Y	Y	Y
Leasure Hall	Y	Y	Y	O	Y	Y	O	Y	Y	N	Y	N	N
McCain Auditorium	Y	Y	Y	O	Y	Y	O	Y	N	N	Y	Y	Y
Mosier Hall	Y	Y	Y	O	Y	Y	O	Y	Y	N	Y	Y	Y
Nichols Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	N	Y	N
Rathbone Hall	Y	Y	Y	Y	Y	Y	O	Y	N	N	Y	Y	Y
Seaton Court	Y	Y	N	N	Y	Y	O	Y	Y	N	Y	Y	N
Seaton Hall	Y	Y	Y	O	Y	Y	O	Y	N	N	Y	Y	Y
Shellenberger Hall	Y	Y	Y	N	Y	Y	O	Y	N	N	N	N	Y
Thompson Hall	Y	Y	Y	O	Y	Y	O	Y	N	Y	N	Y	N
Throckmorton Plant Sciences Center	Y	Y	Y	Y	Y	Y	O	Y	N	N	Y	N	N
Trotter Hall	Y	Y	Y	O	Y	Y	O	Y	N	Y	Y	Y	N
Umberger Hall	Y	Y	Y	N	Y	N	Y	Y	Y	Y	Y	Y	Y
Ward Hall	Y	Y	Y	Y	Y	Y	O	Y	N	Y	N	Y	N
Waters Hall	Y	Y	Y	Y	Y	Y	O	Y	Y	Y	N	Y	Y
Weber Hall	Y	Y	Y	O	Y	Y	O	Y	Y	N	N	Y	Y
Willard Hall	Y	Y	Y	Y	Y	Y	O	Y	N	N	N	Y	N

Table E.3: Ramp Results

Ramps	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23
Ackert Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Bluemont Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Call Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Calvin Hall	Y	N	O	Y	N	Y	N	N	Y	Y	N	N	N	O	N	O	O	O	O	O	O	O	O
Campus Creek Complex	Y	N	N	N	Y	Y	N	Y	Y	Y	N	N	N	Y	Y	Y	N	Y	Y	Y	N	Y	Y
Cardwell Hall	Y	Y	O	Y	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	Y	Y	N	Y	Y	N	Y	Y
Chemistry/Biochemistry Building	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
College Court Building	Y	Y	O	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	N	N	O	N	Y	N
Dickens Hall	Y	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Dole Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Durland Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
East Stadium	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Eisenhower Hall	Y	N	O	Y	Y	Y	Y	N	Y	Y	Y	Y	O	O	Y	O	N	N	Y	Y	N	Y	Y
English/Counseling Services	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Fairchild Hall	Y	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Fiedler Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
General Richard B. Myers Hall	Y	N	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Hale Library	Y	Y	O	Y	Y	N	Y	Y	N	Y	Y	Y	O	Y	Y	O	Y	Y	Y	Y	Y	Y	Y
Holton Hall	Y	N	O	Y	Y	Y	Y	Y	Y	N	Y	Y	N	O	Y	O	Y	Y	N	Y	Y	Y	Y
Justin Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
K-State Student Union	Y	Y	O	N	Y	Y	Y	Y	Y	Y	N	N	O	O	Y	O	N	Y	Y	Y	Y	Y	Y
Kedzie Hall	Y	Y	O	Y	Y	Y	Y	N	Y	Y	Y	N	N	N	Y	O	N	Y	Y	O	Y	Y	Y
King Hall	Y	N	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Leadership Studies Building	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Leasure Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
McCain Auditorium	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Mosier Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Nichols Hall	Y	Y	O	N	Y	Y	Y	N	N	Y	Y	N	O	O	Y	O	N	N	N	O	N	Y	Y
Rathbone Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Seaton Court	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Seaton Hall	Y	Y	O	Y	Y	Y	N	Y	Y	Y	Y	Y	N	O	Y	Y	Y	Y	Y	Y	Y	Y	Y
Shellenberger Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Thompson Hall	Y	Y	O	N	Y	Y	Y	Y	Y	Y	Y	N	N	Y	Y	N	N	Y	N	N	Y	Y	Y
Throckmorton Plant Sciences Center	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Trotter Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Umberger Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Ward Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Waters Hall	Y	Y	O	N	Y	Y	Y	N	Y	Y	N	Y	O	O	Y	O	N	N	Y	Y	N	Y	Y
Weber Hall	N	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Willard Hall	Y	N	O	N	Y	Y	Y	Y	Y	Y	Y	N	N	O	Y	Y	Y	Y	Y	O	Y	Y	Y

Table E.4: Door Results

Doors/Entrances	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ackert Hall	Y	W	E	A	N	Y	Y	N	Y	N	L	Y	Y	61	Y	Y	Y	Y	Y	Y
Bluemont Hall	Y	W	E	S	N	Y	Y	Y	Y	N	L	Y	Y	64	Y	Y	Y	Y	Y	Y
Call Hall	Y	W	E	A	N	N	Y	N	Y	Y	L	Y	N	O	O	Y	O	O	O	O
Calvin Hall	Y	W	E	A	Y	N	Y	Y	Y	N	L	Y	Y	57	Y	Y	Y	Y	Y	Y
Campus Creek Complex	Y	W	E	O	Y	Y	Y	Y	Y	N	L	Y	N	O	O	Y	O	O	O	O
Cardwell Hall	N	W	E	A	Y	Y	Y	N	Y	Y	P	Y	N	O	O	Y	O	O	O	O
Chemistry/Biochemistry Building	Y	W	E	A	Y	N	Y	Y	Y	Y	P	Y	N	O	O	Y	O	O	O	O
College Court Building	Y	W	E	O	Y	Y	N	N	Y	N	L	Y	N	O	O	Y	O	O	O	O
Dickens Hall	N	W	E	O	N	Y	Y	Y	Y	N	L	Y	Y	42	Y	Y	Y	Y	Y	N
Dole Hall	Y	W	E	A	Y	Y	Y	N	Y	Y	P	Y	Y	92	Y	Y	Y	Y	Y	Y
Durland Hall	Y	W	E	A	N	Y	Y	N	Y	Y	P	Y	N	O	O	Y	O	O	O	O
East Stadium	Y	W	E	O	Y	Y	Y	N	Y	N	L	Y	Y	62	Y	Y	Y	Y	Y	Y
Eisenhower Hall	Y	W	E	O	N	Y	Y	Y	Y	Y	P	Y	Y	78	Y	Y	Y	Y	Y	N
English/Counseling Services	Y	W	E	A	N	N	Y	Y	Y	N	L	Y	N	O	O	Y	O	O	O	O
Fairchild Hall	Y	W	E	A	N	N	Y	Y	Y	N	L	Y	Y	78	Y	Y	Y	Y	Y	Y
Fiedler Hall	Y	W	E	A	N	Y	N	N	Y	Y	P	Y	Y	72	Y	Y	Y	Y	Y	Y
General Richard B. Myers Hall	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Hale Library	Y	W	E	S	N	Y	Y	Y	Y	Y	P	Y	Y	54	Y	Y	Y	Y	Y	Y
Holton Hall	N	W	E	O	N	N	N	Y	Y	Y	P	Y	Y	113	Y	Y	Y	Y	Y	Y
Justin Hall	Y	W	E	A	N	Y	Y	Y	Y	Y	P	Y	N	O	O	Y	O	O	O	O
K-State Student Union	Y	W	E	A	Y	Y	Y	Y	Y	Y	P	Y	Y	58	Y	Y	Y	Y	Y	Y
Kedzie Hall	N	W	E	O	N	Y	Y	N	Y	Y	P	Y	Y	63	Y	Y	Y	Y	Y	Y
King Hall	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O	O
Leadership Studies Building	Y	W	E	A	N	N	Y	Y	Y	Y	P	Y	Y	54	Y	Y	Y	Y	Y	Y
Leasure Hall	Y	W	E	O	Y	Y	N	N	Y	Y	P	Y	Y	101	Y	Y	Y	Y	Y	Y
McCain Auditorium	Y	W	E	A	N	Y	Y	N	Y	N	P	Y	Y	85	Y	Y	N	O	O	O
Mosier Hall	Y	L	O	A	Y	Y	Y	Y	O	O	O	O	Y	O	O	O	O	Y	Y	Y
Nichols Hall	Y	W	E	A	Y	N	Y	Y	Y	N	P	Y	Y	65	Y	Y	Y	Y	Y	Y
Rathbone Hall	Y	W	E	A	N	N	Y	Y	Y	Y	P	Y	N	O	O	Y	O	O	O	O
Seaton Court	N	W	E	O	N	Y	Y	N	Y	N	L	Y	N	O	O	Y	O	O	O	O
Seaton Hall	Y	W	E	A	N	Y	Y	Y	Y	Y	P	Y	Y	99	Y	Y	Y	Y	Y	Y
Shellenberger Hall	Y	W	E	A	N	Y	N	Y	Y	N	L	Y	Y	87	Y	Y	Y	Y	Y	Y
Thompson Hall	Y	W	E	A	N	N	Y	Y	Y	N	L	Y	Y	60	Y	Y	Y	Y	Y	Y
Throckmorton Plant Sciences Center	Y	W	E	O	N	Y	Y	Y	Y	Y	P	Y	Y	65	Y	Y	Y	Y	Y	N
Trotter Hall	Y	L	O	A	Y	Y	Y	Y	O	O	O	O	Y	O	O	O	O	Y	Y	Y
Umberger Hall	Y	W	E	S	N	Y	Y	N	Y	N	L	Y	N	O	O	Y	O	O	O	O
Ward Hall	Y	W	E	A	N	N	Y	Y	Y	Y	P	Y	N	O	O	Y	O	O	O	O
Waters Hall	Y	W	E	A	Y	N	Y	N	Y	Y	L	Y	Y	69	Y	Y	Y	Y	Y	Y
Weber Hall	Y	W	E	S	Y	Y	Y	Y	Y	Y	P	Y	Y	70	Y	Y	Y	Y	Y	Y
Willard Hall	N	W	E	O	N	N	Y	N	Y	Y	P	Y	Y	74	Y	Y	Y	Y	N	Y

Appendix F - Survey Samples

Figure F.1: Letter to Get Volunteers



KANSAS STATE
UNIVERSITY



APDESIGN



THE COLLEGE OF
ARCHITECTURE, PLANNING & DESIGN // K-STATE



LANDSCAPE ARCHITECTURE
REGIONAL & COMMUNITY PLANNING

October 2013

Hello Fellow Kansas State University Student,

My name is Ashley Klingler. I am a graduate student here at Kansas State University studying Regional and Community Planning in the College of Architecture Planning and Design. As a graduate student I am working toward completing my thesis. My topic is "Disability Access", in particular, physical access on the K-State campus.

WHY: My good friend growing up had a physical disability, she was in a wheelchair. Growing up with her I noticed how inconvenient it was to get around. While walking around campus it appears to me that ramps are located in odd locations and are not well kept. I have already looked through the Americans with Disabilities Act (ADA) regulations so I am familiar with the technical codes. At K-State, ADA regulations are not tested; they are only checked on a complaint basis. I plan to test if KSU campus is code compliant (meets law) and if it is convenient (user-friendly). As a planner, I am focusing on the exterior of buildings and particularly the entrance sequence. This includes the sidewalk and open area in front of a ramp, the ramp itself, and the door.

THIS STUDY: The convenient component of the study focuses on public perception of access. This will involve volunteers using a wheelchair for a day, and gathering feedback through means of a survey.

If you are interested in helping me, you will assist in creating an all-inclusive study. This is a chance for you to voice your concerns with accessibility on the KSU campus.

If you are interested/would like more information, please contact me at klingler@ksu.edu. If you agree to assist, you will need to fill out a consent form and we can schedule a time for you to borrow a wheelchair for the day.

Thank you for your time. I hope to hear from you soon.

Sincerely,

Ashley E. Klingler

Regional and Community Planning//Graduate Student
Kansas State University
Klingler@K-state.edu
248-978-5874

Figure F.2: Letter of IRB Approval

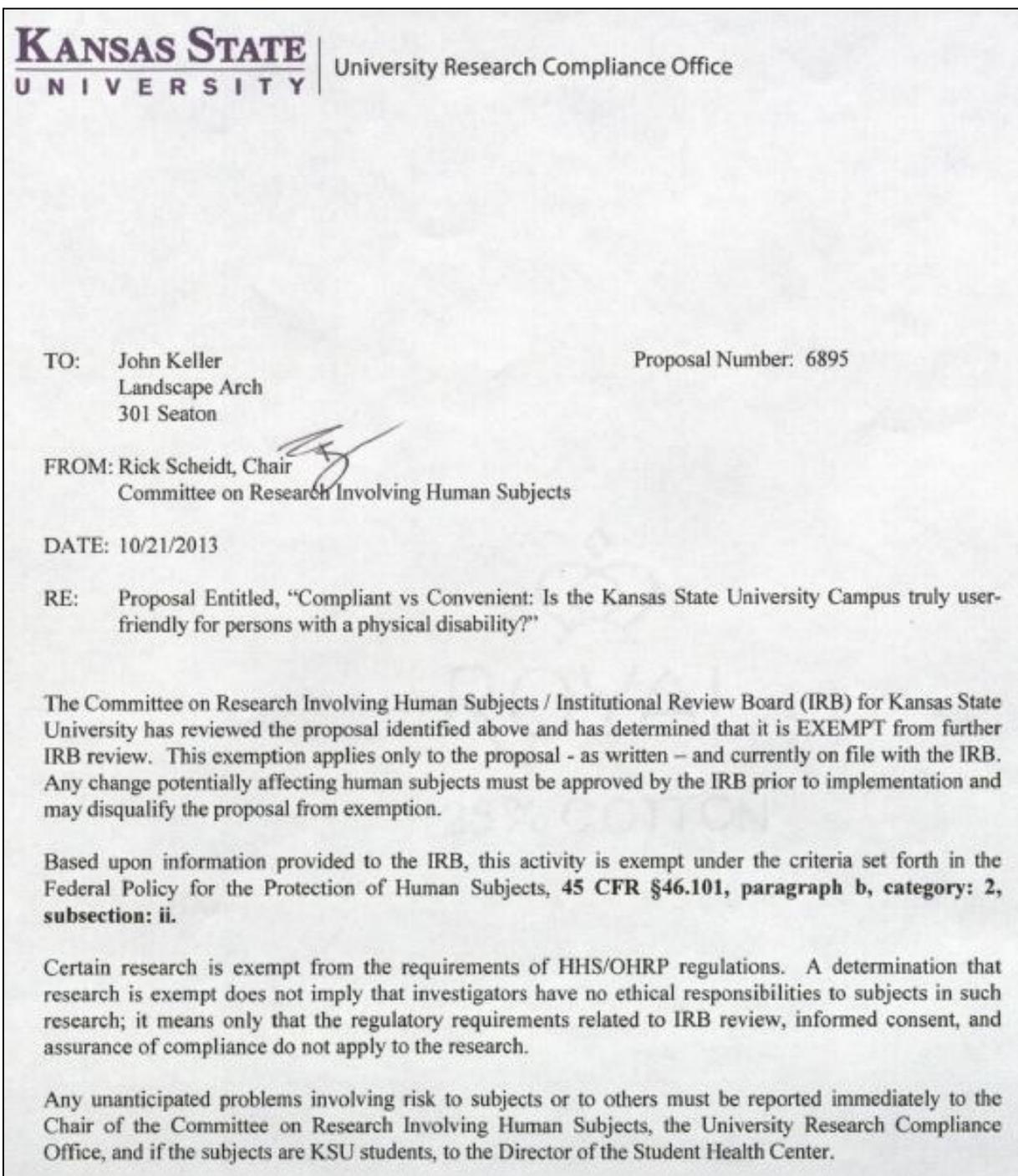


Figure F.3: Consent Form

KANSAS STATE UNIVERSITY- INFORMED CONSENT TEMPLATE	
PROJECT TITLE:	Compliant vs Convenient: Is the Kansas State University Campus truly user-friendly for persons with a physical disability?
APPROVAL DATE OF PROJECT: 10/21/2013	EXPIRATION DATE OF PROJECT: _____
PRINCIPAL INVESTIGATOR: CO-INVESTIGATOR(S):	John Keller
CONTACT AND PHONE FOR ANY PROBLEMS/QUESTIONS:	Ashley Klingler (Graduate Student): Klingler@ksu.edu/248-978-5874 John Keller (Major Professor): jwkplan@ksu.edu
IRB CHAIR CONTACT/PHONE INFORMATION:	Rick Scheidt, Chair, Committee on Research Involving Human Subjects, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224. Jerry Jaax, Associate Vice President for Research Compliance and University Veterinarian, 203 Fairchild Hall, Kansas State University, Manhattan, KS 66506, (785) 532-3224.
SPONSOR OF PROJECT:	Not Applicable
PURPOSE OF THE RESEARCH:	CONTEXT: Ashley Klingler is studying Access for Disabled Persons for her Graduate Thesis project. Klingler plans to test if the Kansas State University Campus in Manttan, KS is code compliant (follows the law) and if it is convenient (user-friendly). THIS STUDY: Klingler hopes to gather public perception of campus access and will use the data from the survey to make her analysis.
PROCEDURES OR METHODS TO BE USED:	THIS STUDY: Volunteers will be found through the leadership studies department (these students take classes all over campus) as well as through the Student Access Center (these students have a physical disability) as the sample. These students who volunteer will use a wheelchair (or use their own, if applicable) for a day on K-state's campus. After the day is complete, they will fill out a survey (likert scale) about the experience. Klingler will then use this data to make her analysis.
LENGTH OF STUDY:	One day of classes, (preferably a day where you have classes throughout campus)
RISKS ANTICIPATED:	Using a wheelchair for the first time could cause frustration. Wheeling yourself around can be physically exhausting. This activity is only for a day, but it could be inconvenient; you will have to be strategic about getting to your classes.
BENEFITS ANTICIPATED:	Gathering public perception is a large component of Klingler's study. You are adding to her research. Her report will be shared with facilities on K-state's campus.
EXTENT OF CONFIDENTIALITY:	Personal contact information will not be shared. Nowhere in the published document will student names be used. A list of students involved will not be shared in the thesis or otherwise documented. The only way this will change is if you personally requests to be quoted or requests to remain as a contact for anyone else doing a similar study. Only Ashley Klingler, Andrea Blair (the Director of Student Access Center), and possibly John Keller (Klingler's Major Professor) will know of the actual members of the study.
IS COMPENSATION OR MEDICAL TREATMENT AVAILABLE IF INJURY OCCURS:	No more risk than any usual day.
PARENTAL APPROVAL FOR MINORS:	If you are a minor (under 18 years of age) and wish to participate, parental permission is required.
<p>TERMS OF PARTICIPATION: I understand this project is research, and that my participation is completely voluntary. I also understand that if I decide to participate in this study, I may withdraw my consent at any time, and stop participating at any time without explanation, penalty, or loss of benefits, or academic standing to which I may otherwise be entitled.</p> <p>If I am borrowing a wheelchair, I agree to treat it with respect and return it in the same condition at which it was given to me.</p> <p>I understand that I am participating voluntarily. By signing I agree that I am in physical condition to wheel myself in a wheelchair. I agree to take full responsibility for any accidents that occur during this activity. This includes, but not limited to, falling out of the chair and causing damage to myself. If an accident occurs I take full responsibility, I do not hold Ashley Klingler, her Major Professor (Keller), Kansas State University, or anyone else liable for the damage.</p> <p>I verify that my signature below indicates that I have read and understand this consent form, and willingly agree to participate in this study under the terms described, and that my signature acknowledges that I have received a signed and dated copy of this consent form.</p>	
Participant Name (Print):	_____
Participant Signature OR Parent/Guardian if under 18 years of age:	_____ Date: _____
Witness to Signature: (project staff)	_____ Date: _____

Figure F.4: Demographic Information

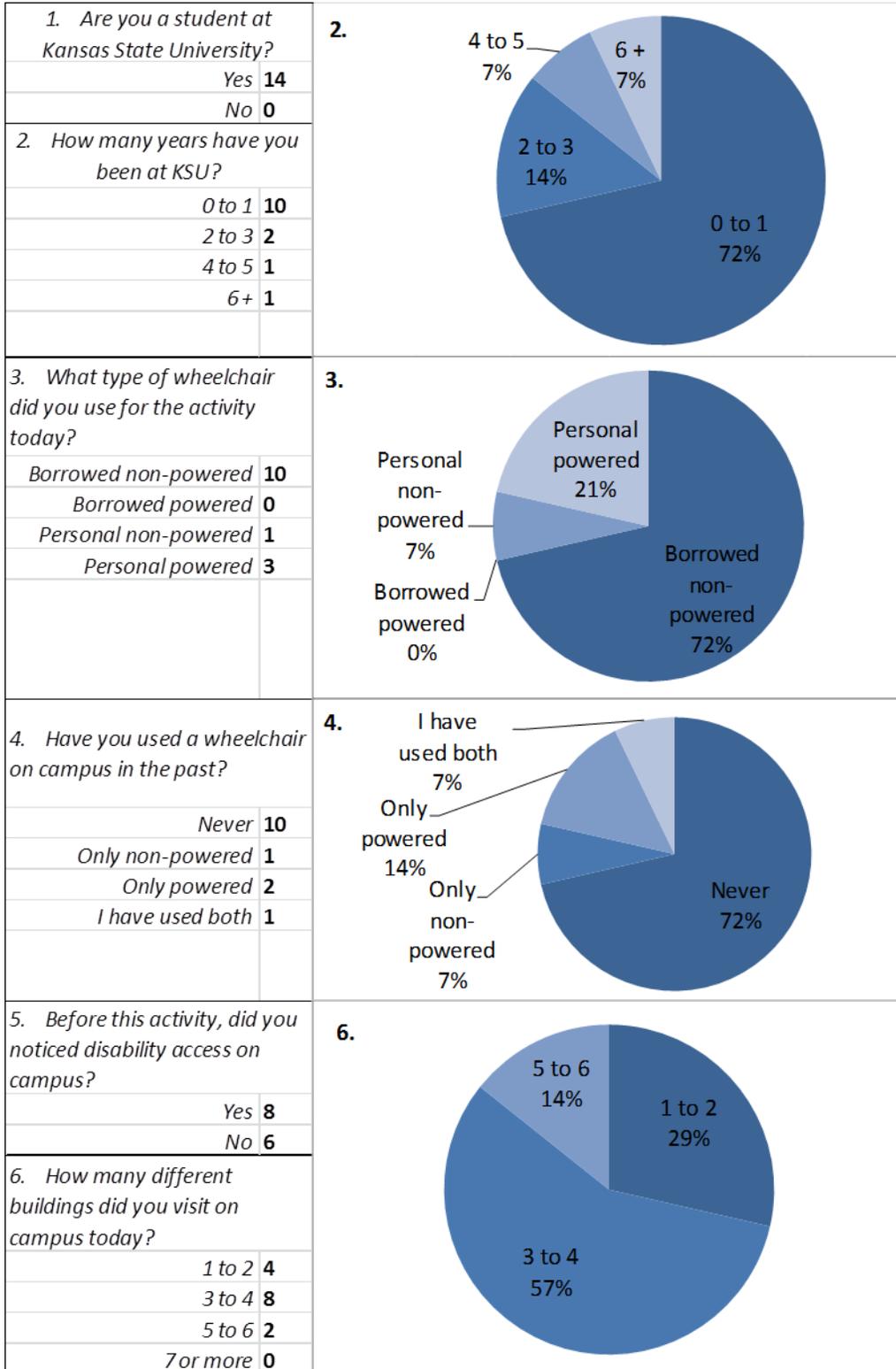


Table F.1: Buildings Visited

7. What buildings did you visit today?		
Building Listed	Number of Times	Any Other Notes
Hale Library	5	
Willard Hall	5	
Bluemont Hall	4	
Ackert Hall	3	
Cardwell Hall	3	
Leadership Studies Building	3	
Eisenhower Hall	2	
Holton Hall	2	
K-state Student Union	2	
Umberger Hall	2	
Calvin Hall	1	
Justin Hall	1	
Kedzie Hall	1	
Leasure Hall	1	Bad doors-(heavy)
McCain Auditorium	1	
Seaton Court	1	
Seaton Hall	1	
Throckmorton Plant Science Center	1	
Ford Hall	1	*
Goodnow Hall	1	*
Kramer Dining Center	1	*
Moore Hall	1	*
Putnam Hall	1	*

** Housing and Dining: Not using in this study*

Table F.2: Relating Survey and Checklist Questions

Survey Question	Checklist Question (s)	Comparison
Sidewalk/Pathway		
1. Pathways were free of steps and stairs	2	Different
2. Plenty of room to pass people	3, 4	Very Different
3. Difficult to maneuver around protruding objects	6, 7	Very Similar
4. Cracks or large gaps provided difficulty to maneuver	9, 10, 13	Very Similar
5. Slope of the sidewalks were too steep	11, 12	Different
Ramp		
1. Used a ramp to get inside	1	Very Different
2. Near the main entrance	2	Very Different
3. Too steep	4, 5	Very Different
4. Surfaces were made with a non-slip material	6	Very Similar
5. Free of obstacles protruding into the pathway	(Focus Group)	-
6. Cracks or large gaps provided difficulty to maneuver	8, 9	Similar
7. Plenty of room on landings to make turns	12, 13	Very Different
8. Railings were provided	15	Similar
9. Railings were at an accessible height	19	Very Similar
10. Railings were made with an adequate gripping	21	Different
11. Railings were fixed so they don't rotate	22	Similar
12. Railings were secured properly to hold weight	23	Similar
Door/Entrance		
1. Canopies large enough to protect from weather	1	Very Different
2. Plenty of room to maneuver in front of the doors	6	Very Similar
3. Plenty of room to fit through the doorways	5	Different
4. Door thresholds were too steep	7, 8	Very Similar
5. Doors were mostly automatic or not automatic?	-	-
Au: buttons worked properly	17	Very Similar
Au: open long enough to get through	18, 19, 20	Very Similar
Not Au: easy to open while seated in the wheelchair	16	Very Different
6. Handles operable without twisting of the wrist	10	Very Similar
7. Hardware mounted at an accessible height	12	Similar
Over all, did you follow your usual path?	-	-

Figure F.5: Sidewalk Analysis

1	Strongly Agree/ Always	Very Good
2	Agree/ Most of the time	Good
3	Disagree/ Some of the time	Bad
4	Strongly Disagree/ Never	Very Bad
N	Not Applicable/ Did not Notice	Indifferent

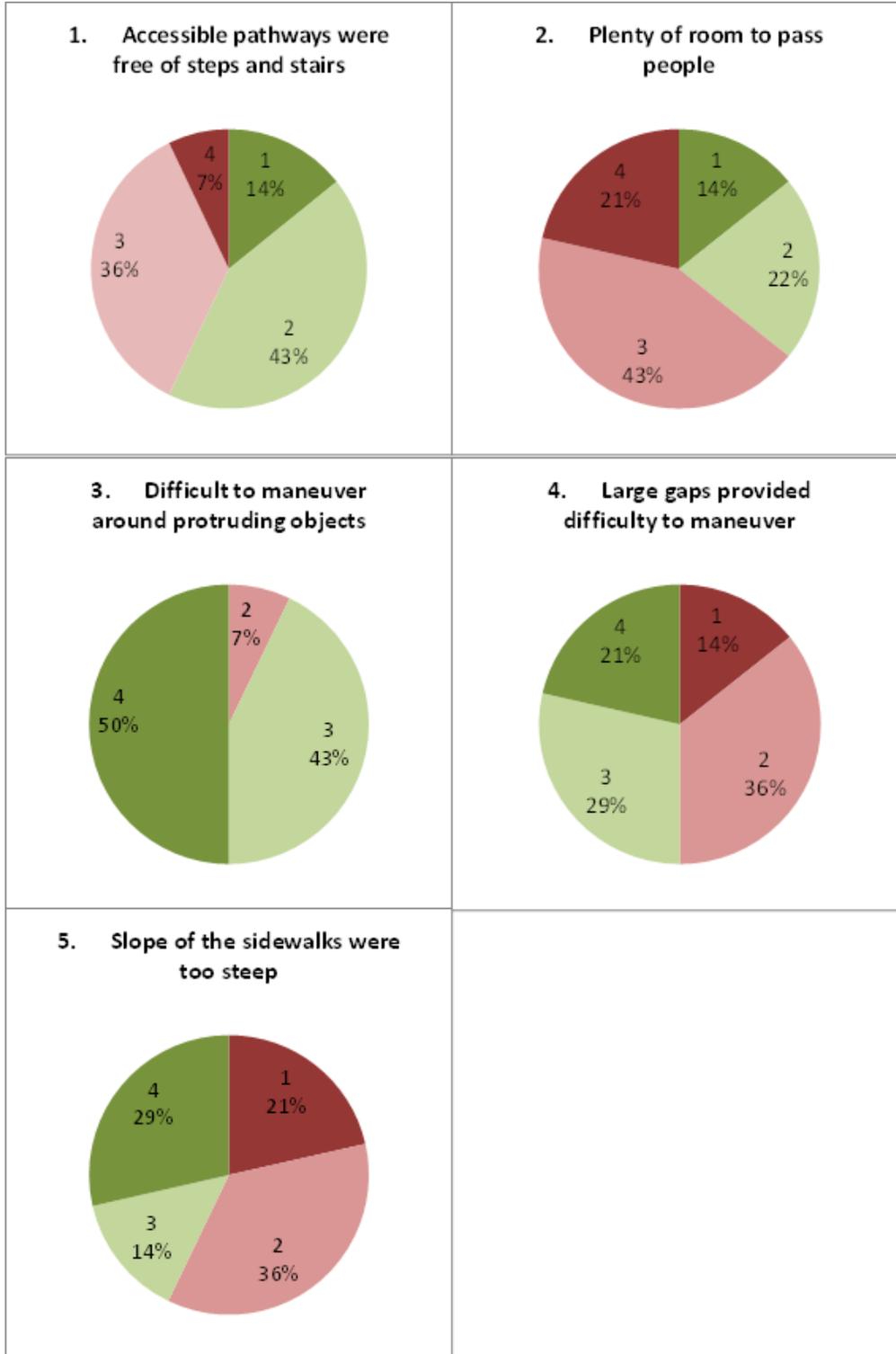


Figure F.6: Ramp Analysis Part 1

1 Strongly Agree/ Always	Very Good
2 Agree/ Most of the time	Good
3 Disagree/ Some of the time	Bad
4 Strongly Disagree/ Never	Very Bad
N Not Applicable/ Did not Notice	Indifferent

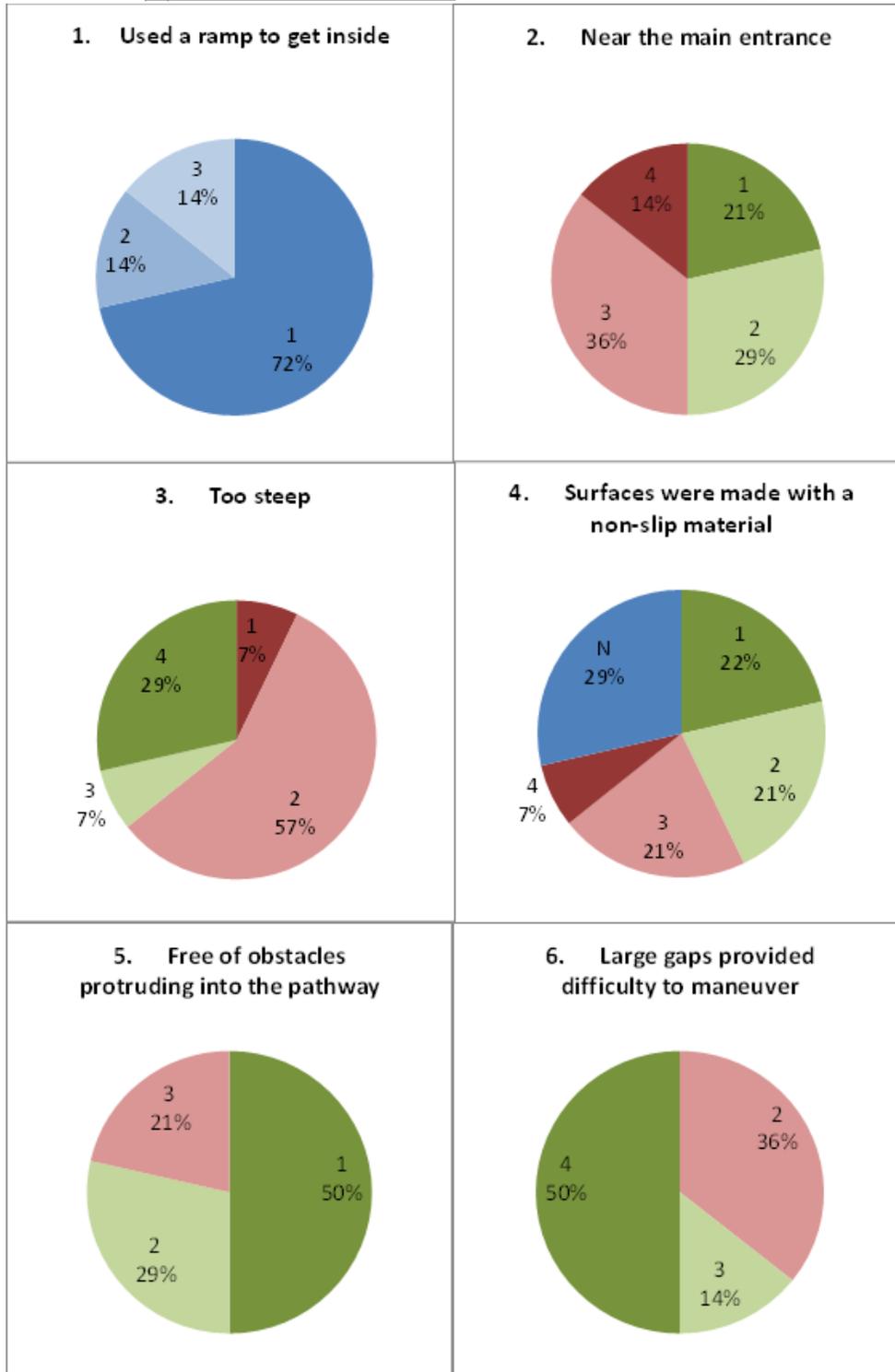


Figure F.7: Ramp Analysis Part 2

1 Strongly Agree/ Always	Very Good
2 Agree/ Most of the time	Good
3 Disagree/ Some of the time	Bad
4 Strongly Disagree/ Never	Very Bad
N Not Applicable/ Did not Notice	Indifferent

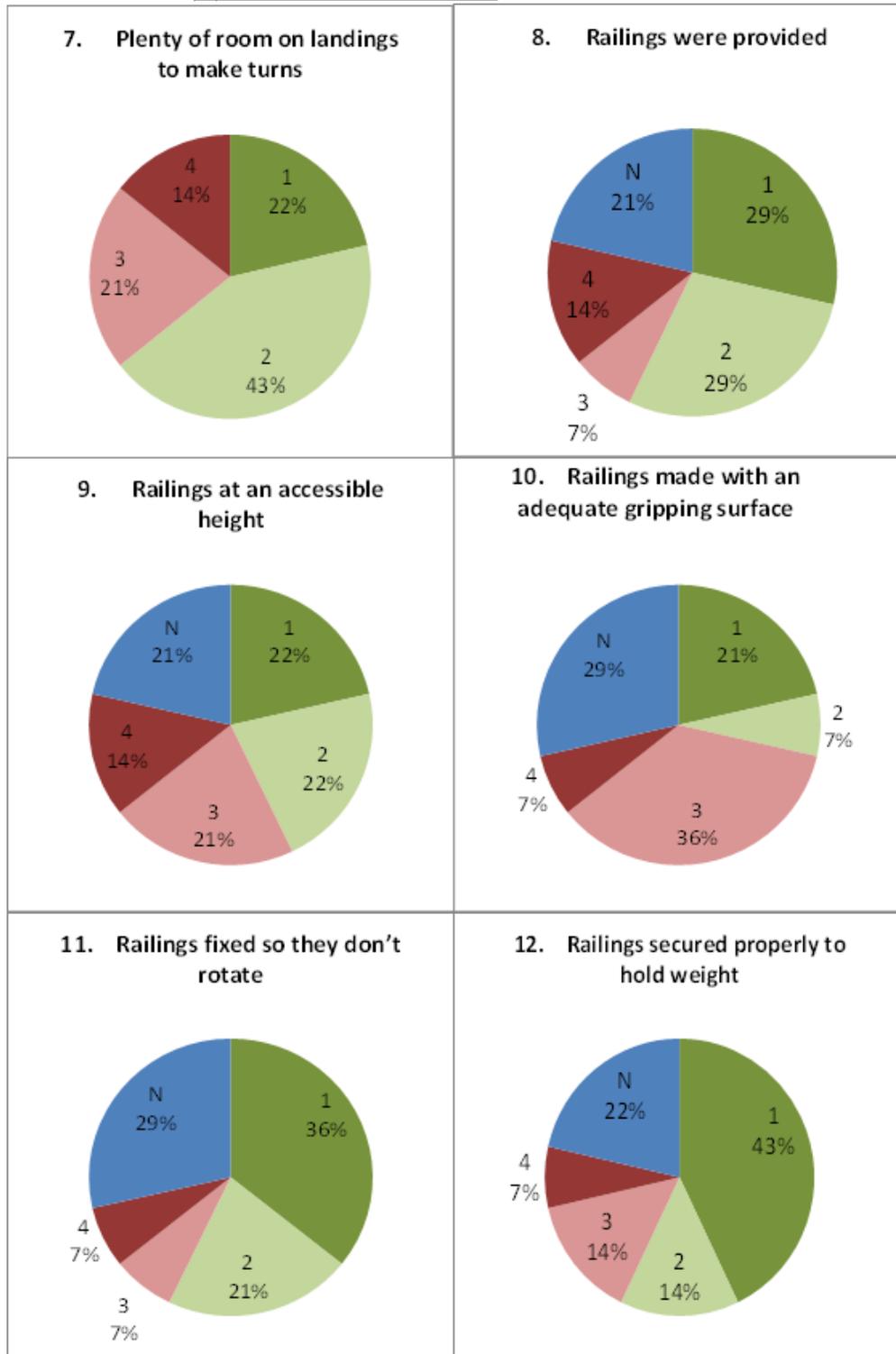


Figure F.8: Door Analysis Part 1

1	Strongly Agree/ Always	Very Good
2	Agree/ Most of the time	Good
3	Disagree/ Some of the time	Bad
4	Strongly Disagree/ Never	Very Bad
N	Not Applicable/ Did not Notice	Indifferent

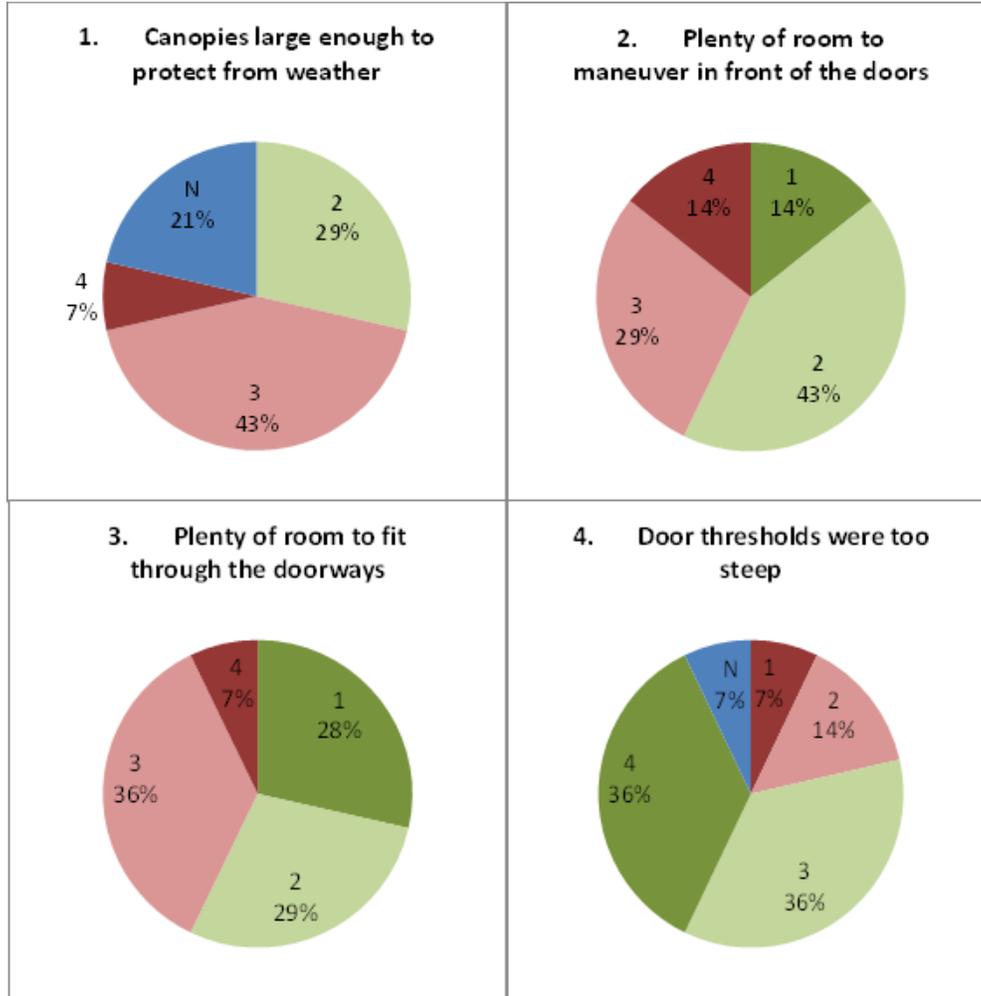


Figure F.9: Door Analysis Part 2

1	Strongly Agree/ Always	Very Good
2	Agree/ Most of the time	Good
3	Disagree/ Some of the time	Bad
4	Strongly Disagree/ Never	Very Bad
N	Not Applicable/ Did not Notice	Indifferent

