

The Washington Court Housing Survey:

A Study of Accessibility and Universal Design in Affordable Housing

A Report Prepared by the University of Iowa Clinical Law Program

April 20, 2009

The University of Iowa Clinical Law Program is pleased to release this report and the results of our research study about tenant awareness, use and benefits of accessibility and universal design features in an affordable housing complex in Dubuque, Iowa.

This community-based systems reform project and research study was developed by Student Legal Interns under the supervision of Professor Leonard A. Sandler.

The Student Legal Interns who participated in the design, construction and evaluation of the building, created and administered the survey and authored this report are: Sara Stephenson, Andrew Ward, Syd Gernstein, Aaron Aizenberg, Rachel Antonuccio, Kirsten Arnold, Todd Bagby, Kevin Barstow, Ross Binder, Scott Burrill, Michelle Croft, Jackie Famber, Jason Fernandez, Nick Kehrwald, Andrew Knutson, Jayne Lady, Abby Lemek, Karla Martinez, Adam McCabe, David Milender, Jennifer Moyer, Trent Norman, Reuben Ortega, Benton Page, Bill Pepper, Roselyn Tyson, Matt Van Maasdam, and John Walker.

We gratefully acknowledge the assistance and contributions of the “Tenants of Washington Court,” John and Mary Gronen, Jolene Kingeter, David Harris, Kelly Larson, Paul Kalb, Jordan Pettus, Mishelle Eckland, Rebecca Yoder, Helen Schartz, Lisa Halm-Warner, Heather Ritchie, Sarah Davidson, Marilyn and Lary Belman, Doug Boothroy, Heather Shank, Ed Gaines, Lucy David, the Home Modifications Task Force ListServe, and the countless others that shared their expertise, insights, questions and suggestions.

For more information, or to request copies of the report in print, digital, .pdf or other format, please contact the University of Iowa Clinical Law Program by calling 319.335.9023 or sending an email to leonard-sandler@uiowa.edu.

The complete report and all of the appendices are available online on a temporary basis at <http://www.uiowa.edu/~clinic/> until our new site is up and running. ©2009 Leonard A. Sandler, University of Iowa Clinical Law Program.

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I. Executive Summary

A. The Washington Court Survey

The University of Iowa Clinical Law Program is pleased to release “The Washington Court Housing Survey: A Study of Accessibility and Universal Design in Affordable Housing.” This project is one of many community-based and systems reform initiatives the clinic has designed and implemented to increase mainstream housing opportunities for persons with disabilities and promote universal design and sustainable, multigenerational housing of all types.

Throughout the country, in rural and urban areas, there is a critical shortage of affordable housing that is accessible and usable throughout a person’s life span. That shortage existed in Iowa long before floods, tornadoes and other natural disasters devastated the State in 2008. Many Iowans who have experienced injury, illness, disability, or who are simply getting older, find they cannot enter, navigate freely or live independently in the homes or apartments they own or rent. They are forced to leave their homes and communities, risk institutionalization or spend thousands of dollars in home access modifications because houses or apartments with fewer than four dwelling units are typically not covered by any federal or state accessibility or universal design code. To compound the problem, the few accessibility standards that do apply to dwellings contain only minimum specifications and dimensions that do not address or reflect the real world needs of many persons with and without disabilities. These risks are even more pronounced now, especially for older residents and persons with disabilities whose homes were damaged or destroyed.

In 2005, City of Dubuque officials and Gronen Restoration, Inc. invited the Clinic to furnish technical support and consultant services regarding the major rehabilitation and adaptive reuse of the former Dubuque Casket Company. The building was converted into 36 affordable rental housing units. The complex also now includes the offices of a health care provider and a social service agency. The initial goal of the Clinic was quite modest; we were to review the drawings and floor plans and tour the building to “see what we can do to go above and beyond the basic requirement for the handicap accessibility while staying within our [the developer’s] budget.” That mission was greatly expanded over the years and Washington Court became a singular project that spanned nearly every aspect and phase of the enterprise. The Clinic’s role ranged from the design and construction of the building to a post-occupancy study of the use, effectiveness and benefits of the building’s accessibility and universal design features.

This report documents the project’s final phase, a research study to learn whether residents are aware of, use or benefit from the universal design and accessibility features in the apartments and common areas. The overarching goal is to determine if universal design makes sense in the 21st century and enhances quality of life, safety, comfort and convenience. We hope to add to the growing body of evidence demonstrating that universal design is valued by individuals, communities and the public and private sectors.

We had several specific objectives. The first objective was to learn about residents’ experiences living at Washington Court. We were interested in 1) what motivated residents to move to Washington Court, 2) whether the universal design features have added to residents’ quality of life, and 3) what the residents would change about Washington Court. The results section of this report covers these topics. The second objective was to test our survey instrument’s effectiveness in gathering information on accessibility and universal housing design more generally. The methodology section of this report covers these topics. We also wanted to design a survey that others could use based upon our experience in administering the Washington Court survey. The appendices include our suggestions for conducting your own

universal design survey and a checklist to help organize and focus your efforts. The third objective is to encourage builders, developers and funding agencies to use the survey results and recommendations and voluntarily incorporate universal design into residential, business and commercial facilities. The fourth objective is to persuade state and local lawmakers and agencies to require minimum universal design features in publicly funded housing of all types or to provide incentives for builders, developers and consumers to do so.

People often use words like accessible, adaptable, and universal design interchangeably; even we blur the distinction between these terms in several places in this report; however, each term has a generally accepted definition or is defined by law or regulation. For this report:

“Accessible” means that the residence meets the minimum requirements and dimensions of accessibility and building codes. These standards typically address minimum door widths, grab bars, the height of outlets, switches and controls and other features primarily to address mobility, reach and vision impairments. The most commonly used standards are found in the regulations to the Fair Housing Amendments Act of 1988, the American National Standards Institute (ANSI) Standards A117.1-1998, and the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

“Adaptable” means that some features are designed to be modified or changed to address the needs of an individual with a disability and other renters or owners as they age, without the need to hire skilled labor or make significant and costly structural changes. Additional wall backing in bathrooms and bedrooms will allow for future installation of grab bars. The space beneath cooktops and sinks can have adjustable shelves and doors that are hinged, recessed or removable to allow for storage or for clear space, as the resident’s mobility and other physical abilities fluctuate.

“Universal design” means incorporating features and design elements that venture beyond accessibility and codes to make homes, apartments and the built environment usable by as many adults and children as possible. Universal design emphasizes visual appeal and usability; it does not focus on disability or the specific functional limitations of any individual and does not involve the use of adaptations or special designs. For example, Washington Court includes front-loading, raised washers and dryers and top-loading washers, no-step entrances, power assist doors, and the switches for the kitchen fan, garbage disposal and lights mounted at the front of the cabinets within easy reach.

The primary emphasis of our report is on the people who live in the building, not the building itself. Understanding the target population -- the tenants in this case -- is important in interpreting any data collected through a survey. Preliminary information about the population provides guidance in the early stages of survey design and later in revisions. Such was the case with Washington Court, where we designed our initial survey based on information we received about the income requirements, the number of standard and “handicap-accessible” units and the number of tenants. We were later able to use that information in combination with more detailed data we obtained in the survey to assemble a portrait of the people of Washington Court.

To add detail to the data we collected about residents of Washington Court, we included some questions about the residents’ basic demographics. This part of our investigation included questions about residents’ living arrangements, income, and when and why they moved to Washington Court. So as to better understand residents’ responses to the main questions about the building, we also asked residents about their functional limitations, independence, need for

assistance, and finances. The information we collected is summarized below as a portrait of the people of Washington Court.

Outside of information about the residents themselves, we also sought out information as to whether universal design (UD) features improve the residents' quality of life. We discovered that they are divided over the benefits of universal design. One group values universal design features, while the second is apathetic towards UD features. Residents who value UD notice the features, use them, and find them important. These residents would like additional UD features. On the other hand, residents who are apathetic towards UD have not noticed the features, do not use them, and are indifferent towards adding more UD features to the building. The ratio of residents who value UD and apathetic residents is almost one-to-one.

We considered the best method of administering the survey, including paper-based, web-based, phone, personal or group interviews, focus groups, and various other methods. Because we operate as a law firm, we did not have the resources or expertise of research firms needed for many of these methods. We opted to do structured telephone interviews. One of the things we learned is that it is both difficult and time consuming to conduct such in-depth interviews over the phone, for both researchers and the residents of Washington Court. In addition, it is difficult, if not impossible, to develop perfect questions that elicit the information sought. In retrospect, we were quite ambitious; studies of this scale should be left to firms with the time, resources, and expertise to fully evaluate and conduct a survey of this magnitude.

Our study provides a snapshot of the residents at Washington Court in the fall of 2008. As a result of only interviewing 22 respondents, our findings are not necessarily representative of the population at large. However, what we did find implies that universal design gives Washington Court a long-term competitive advantage over other housing for tenants who receive Housing Choice Vouchers (Section 8 vouchers) or other subsidies because their income is at or below a certain percentage of the area median income (60% for Washington Court).

Washington Court stands out from other affordable housing because it is new and because of its universal design features. Residents who value UD chose Washington Court over other subsidized housing options in part because of the UD features. Residents who are apathetic towards UD chose Washington Court because it is a new building, regardless of the UD features. Thus, Washington Court will maintain its competitive advantage over other federally-subsidized housing projects and other complexes even as the building ages because it will continue to attract residents who value UD features even when the building is no longer new.

Developers can surpass the Washington Court model in three ways to increase their competitive advantage in the affordable housing market. First, developers can add features that all residents want, regardless of whether they value or are apathetic towards UD. The features include:

- Security features, such as a secured front entrance with a security code, security cameras throughout the building, and peepholes in apartment doors.
- An open layout with large living space and large bedrooms.
- Windows residents can easily open (especially in rehabbed historical buildings).
- A walk in closet or utility room for storing large items.
- Extra lighting through the unit, including an overhead light in every room.
- Energy efficient appliances.
- Under-cabinet lighting in the kitchen.
- Rounded counter top edges in the kitchen and bathroom.

- Lots of flexible work space in the kitchen, including counter tops at varying heights and cutting boards that pull out from underneath the counter top.
- A side-by-side refrigerator and freezer with pull-out shelving.
- A full-length mirror mounted on the bathroom wall.
- A washer and dryer in each apartment.
- Alternatively, if there are laundry rooms, counters at varying heights for folding clothes.
- A buzzer at the front door to buzz guests in.

Second, developers can add discrete features that will attract residents who value UD without deterring residents who are apathetic towards it. Developers should add these features throughout the building to attract residents who value UD in every unit. Many of these features are also relatively inexpensive. They include:

- Clear space under the sink and cooktop
- Backlit, rocker-style light switches with dimmers mounted lower than usual.
- Electrical outlets and cable jacks mounted higher than usual.
- A thermostat with a large digital display mounted lower than usual.
- Switches for the garbage disposal exhaust fan and cooktop light mounted on the front side of the counter instead of at the back.
- Lever style door handles throughout the building instead of round door knobs.
- Adjustable height shelves and clothes rods in the closets.
- Bi-fold closet doors.
- In-wall backing for bathroom grab bars pre-installed so that grab bars can be added upon request.
- Non-slip flooring in the bathroom.
- Front loading washers and dryers
- A ramp at the front entrance.
- Front entrance doors that open automatically.

Finally, developers can add obvious UD features in select apartments. Even though a few of these features might be a bit more expensive to install, there is a distinct market for them. Demand for these units will continue even after the building ages because residents who value UD will seek these units. These features are in addition to those listed in the last section and include:

- Upper kitchen cabinets mounted lower than usual.
- Oven and dishwasher mounted off the ground.
- Grab bars in the bathroom already installed.
- A roll-in shower with a shower seat.

B. Future Directions and Research

When we embarked on the Washington Court research project our goals were extremely ambitious. The initial team asked whether and how living in a universal design apartment could change and benefit people's lives. We had hoped to evaluate the effectiveness of certain features and amenities. The research team posited that UD resulted in increased social, educational and employment opportunities, decreased reliance on home health care, personal assistance services, and public benefits, and allowed for greater independence. The grand scheme was to interview tenants every six months for several years to record and evaluate their

income, benefits, third-party assistance, social activities and functional abilities. In retrospect, these objectives were impractical and far beyond the resources, budget and expertise of our clinical law program, which operates as a law firm.

That said, we believe that our research supplements the existing data surrounding residential universal design and might be used to spark discussions and contribute to policy debates about multigenerational and affordable housing. From our perspective, the project is a success if stakeholders use the report, conduct-your-own survey and universal design checklist to evaluate living environments and share their experiences with others.

All limitations aside, the report furnishes a snapshot of the people who lived in the apartments in October 2008 and chronicles their impressions, experiences and opinions. Additional research will be required to develop a more detailed portrait of people at Washington Court and people who live elsewhere. We are fairly certain that other organizations are conducting more rigorous formal research studies; we look forward to receiving their findings and insights. This section summarizes ongoing and potential Clinical Law Program projects and gives suggestions for how to better examine universal design in different contexts.

Expand the Washington Court Housing Survey. A more elaborate survey is needed to supplement and interpret our original findings with a larger sample size. The study population could include all residents of subsidized housing units in Dubuque. Or, researchers could study tenants in larger apartment complexes in other cities. We hope to replicate and expand upon our findings and confirm that there are two distinct groups of residents, those who value UD and those who are apathetic toward it. Refining our methodology will hopefully result in statistically significant and generalizable findings, particularly about people who have functional limitations and those who do not.

Conduct a Matched Pair Analysis of a Universal Design and Standard Built Single Family Home. The REALTOR® Homes For Our Future is a homeownership project in Iowa City to build and showcase an affordable, single family home that incorporates universal design, green and sustainable building practices. <http://www.icaar.org/node/483>. The home is based on a standard model the local developer routinely constructs. We modified the original design, floor plan, equipment, heating systems and other features to incorporate universal design (and green features, such as geothermal heating). The buyers have agreed to be interviewed several times after the sale to help us evaluate the usability, desirability and cost-effectiveness of the modifications. We also plan to study the specific and opportunity costs of universal design. The project may decide to test using the conduct-your-own survey and checklist we developed.

Evaluate Universal Design in Historic Preservation. Step by Step Inc., and the City of Dubuque asked us to help redesign, rehabilitate and transform an 1890s brownstone into seven universal design apartments and a community kitchen for use by persons with disabilities. We secured permission from HUD to grant priorities to income eligible applicants with qualifying disabilities. These applicants must use mobility aids and need the UD and accessibility features in the building, such as the elevator, power assist doors, top loading microwave, motion-sensor lighting, roll-in or low threshold showers, etc. Tenants are expected to move into the building in May 2009. City officials are interested in surveying the tenants on an ongoing basis to measure the benefits and cost effectiveness of UD and energy-saving devices in the building. They are considering using the survey and checklist we developed or enlisting our help in conducting the study. The city will review its building codes and contracts and determine if it will require minimum UD features and standards in all publicly funded housing projects.

Universal Design in the Workplace and Commercial Facilities. Do businesses and employees benefit from universal design? And, if so, what should the design and construction standards be? These questions are unresolved and, for the most part, have largely been ignored by the private sector to date. Gronen Restoration requested that we review the drawings and floor plans for the adaptive reuse of the historic Roshek Building in downtown Dubuque, which was formerly a department store. Future tenant IBM intends to open a technology service delivery center that is LEED-certified and includes UD. Another opportunity arose recently in Dubuque; the city is revitalizing its Warehouse District for mixed residential and commercial use and is interested in incorporating UD as it expands. In a related vein, The Global Universal Design Commission is researching and developing voluntary consensus standards for buildings, products and services to guide corporations and government entities in the creation of barrier-free commercial facilities.

Developing a Model to Record, Track and Measure Project Costs. Documenting the costs associated with universal design has been problematic for just about everyone involved in housing. On-site change orders, purchase orders and receipts, bid books and itemized accounts are often misplaced or archived quickly as one project ends and another begins. To complicate matters, the price of hardware, cabinets, appliances and fixtures fluctuate, vendors go out of business or rename their products and many label items as ADA-approved even though no one certifies or approves products based on complying with ADA Accessibility Guidelines. Hard, accurate and reliable cost information is hard to find. A focal point of future research should be the creation of a system to record, track, and measure project costs.

A retrospective examination of Iowa City's B Street UD Home. In 2001, the city teamed up with a local homebuilder, the legal clinic and community organizations to design and build a single-family home with basic and state of art features, including a motorized, adjustable kitchen sink. One of the owners has lived there since he bought the house in 2003; he has opened the home to the public and clinic students every year. With his permission and adequate resources, we will inspect and photograph the house to find out how well the appliances, cabinets, hardware and fixtures have held up to daily use. We have videos and pictures of the home to conduct a "before and after" assessment to supplement personal interviews. Information, floor plans and pictures are at <http://www.icgov.org/default/?id=1169> and <http://www.uiowa.edu/infotech/News17-1.pdf>.

II. Background for Washington Court

A. The Washington Court Complex

The Building. Washington Court is located at 1798 Washington Street in Dubuque. It involved the major rehabilitation and adaptive reuse of the former Dubuque Casket Company into 36 affordable rental housing units. Twenty-four of the 800 to 900 square foot units are one bedroom units and twelve of the 900 to 1000 square foot units have two bedrooms. Nine of the units are designed and equipped to meet the needs of persons with mobility and sensory impairments and to the extent practicable, the facility includes universal design features to promote life-span living for persons of different ages and abilities. To rent an apartment at Washington Court, a tenant must have income that is at or below 60% of the area median income.

Development Team. Community Housing Initiatives, Inc., a nonprofit organization located in Spencer, Iowa teamed with Gronen Restoration, Inc. to develop Washington Court. In Vision Architecture of Sioux City along with Jeff Morton of Dubuque were the project architects.

Funding. The development team secured funding from a variety of public and private sources to complete the project. The most significant dollars came from:

Conventional Bank	200,000
IA Dept Economic Development (HUD HOME Pass-through)	800,000
City of Dubuque (HUD CDBG pass through)	200,000
Cit of Dubuque (HUD Lead Paint Abatement Funds)	188,000
Iowa Housing Enterprise Zone Tax Credit Proceeds	177,878
Low Income Housing Tax Credit Proceeds	2,875,133
Federal Historic Rehabilitation Tax Credit Proceeds	906,794
Iowa Historic Rehabilitation Tax Credit Proceeds	<u>613,141</u>
Total	\$5,969,946

Building Codes, Accessibility Standards and Universal Design Guidelines. The complex includes 36 affordable apartments on the upper three floors and the Crescent Community Health Center and Project Concern, a social service agency, on the ground floor. To qualify for tax credits and be listed on the National Register of Historic Places in 2006, the award-winning project also had to retain or incorporate specific features and elements. The mixed-use and multi-family dwelling facility was built with certain tax credit and block grant funds, which required the architects and contractors to meet many and sometimes conflicting building code and accessibility standards. As a result, several rooms or spaces were subject to one or more construction standards.

To eliminate or reconcile differences, the project employed the standard that provided the greatest degree of access and usability. Universal design standards were developed by the University of Iowa Clinical Law Programs from a variety of sources, including previous projects, Iowa Finance Authority inspectors and other entities that are noted in the Washington Court Universal Design Survey Checklist in the appendix. Here is select list of applicable codes and standards.

2003 International Building Code
2003 International Residential Code
1997 Uniform Code for Building Conservation
Uniform Federal Accessibility Standards (UFAS)

Americans with Disabilities Act Accessibility Guidelines (ADAAG)
Fair Housing Act Accessibility Guidelines (FHAct)
ANSI accessibility standards for public and common uses areas
Iowa Code Chapter 104A
Iowa Department of Public Safety Rules: individual dwelling units 661 IAC 16.720
Iowa Department of Public Safety Rules: reserved parking 661 IAC Ch. 18
Iowa Department of Public Safety Rules: public/common use areas 661 IAC Ch. 16

B. Clinical Law Program Role and Activities

The Clinical Law Program has for more than a decade engaged in community and systems reform projects to address the critical shortage of housing in Iowa that is affordable, accessible and usable throughout a person's life span. Student Legal Interns and faculty provide no-cost technical and consultant services and legal advice to lawmakers, agencies, non-profits and grassroots organizations on a variety of issues. Our philosophy and basic premise is to make buildings and apartments as welcoming as possible to as many people as possible regardless of age, size, shape and ability. When dwellings are not properly designed from the outset, people cannot live independently, use the sink, stove, bathtub or shower without assistance, do the laundry, use the intercom system, entertain guests or negotiate their home. To address the concerns of all stakeholders, we face the difficult task of balancing cost and features against the different levels of usability and livability. The mission, as we see it, is to leave disability out of the equation so developers and the public no longer think "ramps" and "wheelchairs." Washington Court is singular in that it involves every project phase -- from the design and construction of the building to our post-occupancy study of tenant awareness and the effectiveness, use and benefits of the building's access and universal design features. Our initial role began in 2005 when City of Dubuque officials and Gronen Properties enlisted our help to research and review universal design features, appliances and technology and focus on designs and solutions that were practical and affordable.

To meet these initial objectives, we participated in the Iowa Fair Housing Act Accessibility Conference, met with Iowa Finance Authority specialists to review the drawings, universal design options and costs, and toured several private homes that showcase basic and state of art technology and smart design for multigenerational living. We solicited recommendations from home modification and universal design listservs and, to gain a more human and real-world perspective, we attended and made presentations at housing and disability conferences.

For instance, we attended the Voices Summit, a two-day conference hosted by the directors of independent living centers that promoted independent living. Our team prepared walkthrough checklists and issue sheets in large print, made projections of the blueprints available for anyone who required them, personally interviewed about 35 people with mobility, sensory and intellectual impairments and canvassed most of the 120 attendees and vendors to get their feedback on the blueprints. We educated people about the Washington Court Project and provided them with drawings of all of the apartments, bathroom and kitchens. Most important, we collected comments criticisms and suggestions from people about the barriers they confront in their homes on a daily basis and asked them how they would change the design, layout or appliances to enhance usability and accessibility. We also asked Jordan Pettus of Corridor Design and other local specialists to review the plans and exchange ideas on construction, costs and design. These consultations yielded a wealth of information, ideas, and resources that exceeded our expectations.

Our second objective was to apply what we had learned and conduct a review of the drawings created by In\Vision Architecture and architect Jeff Morton. After considering the recommendations we received from consumers and trade professionals we conducted a comprehensive review of the drawings and consolidated our findings into a master checklist. In October 2005, we presented our findings and recommendations to the developer and the Dubuque Housing Commission. The plans were revised somewhat in response to our comments and we subsequently prepared another report that noted the degree to which our initial recommendations were implemented or incorporated into the facility.

Later, we toured and surveyed the building during several construction phases, including pre-cover (before the walls were finished) and post occupancy inspections. We fielded questions onsite and from our offices on matters ranging from code compliance and conflicts to minimum dimensions and specifications for roll-in showers, mailboxes, alarms, counter-tops, stoves, controls, furniture and lighting. In addition, we constantly updated the contractor and developer on universal design breakthroughs and concepts. In the process of design and construction we offered advice as well as criticism when it was appropriate. As watchdogs we sought to ensure that at least minimum regulatory guidelines were met, and as advocates we further sought to ensure that the tenets of universal design would be followed wherever practicable.

While construction was proceeding, the City of Dubuque asked the Clinic to continue its involvement with the Washington Court project in conducting research on whether tenants used or benefited from any of the building's amenities and features. With this mandate and our institutional memory, we set out to design and conduct a rigorous research study and sought the assistance of Dr. Helen Schartz of the UI Law, Health Policy & Disability Center, Lisa Halm-Werner, now with Kleffmann Group North America, and Heather Ritchie, a Graduate Student with the University of Iowa School of Social Work and noted disability advocate. When construction was complete, we attended the ribbon cutting ceremony, toured the building several times to verify information needed for the study and shifted our focus to obtaining approval from the university Institutional Review Board.

Over the next year, as tenants began to move into Washington Court, we worked to design a research plan and study that capitalized on our ever present involvement and the relationships we developed over the years. The research team fine-tuned the survey's focus, completed the questionnaire and literature review, created informed consent and notice materials for the tenants and sought Institutional Review Board (IRB) research certification for each team member. The IRB approved the research project in April 2008 and we fielded the survey that fall. Lisa Halm-Werner provided phone training and support and Sarah Davidson furnished invaluable feedback as the first test subject.

C. The Washington Court Project and Goals

We had several objectives for our study of Washington Court. The first objective was to learn about residents' experiences living at Washington Court. We were interested in 1) what motivated residents to move to Washington Court, 2) whether the universal design features have added to residents' quality of life, and 3) what the residents' would change about Washington Court. The results section of this report covers these topics. The second objective was to test our survey instrument's effectiveness in gathering information on accessibility and universal housing design more generally. The methodology section of this report covers these topics. The appendices include our suggestions for conducting your own universal design survey. The third objective is to encourage builders, developers and funding agencies to use the information and findings and voluntarily incorporate universal design into residential, business and commercial facilities. The fourth objective is to persuade state and local lawmakers and

agencies to require minimum universal design features in publicly funded housing of all types or to provide incentives for builders, developers and consumers to do so.

D. The People of Washington Court

Understanding the target population is important in interpreting any data collected through a survey. However, some preliminary information about the population provides some guidance in the early stage of survey design and later in revisions. Such was the case with Washington Court, where we designed our initial survey based on some information we already had about the residents. We were later able to use that information in combination with more detailed information we obtained in the survey to assemble a portrait of the people of Washington Court.

We extrapolated most of the preliminary information we used from information we were provided about the building. This data was quite broad and vague, but it nonetheless helped us devise a survey that was generally applicable to our target population. For example, before we crafted our survey, we knew that we would encounter some residents with functional limitations because of handicap accessible units at Washington Court as well as the purpose of this study. We also knew that residents would have to meet income requirements to live at Washington Court because it is subsidized housing. However, we did not limit our inquiry to these early generalizations and sought more detailed information in the survey itself.

To add detail to the data we collected about residents of Washington Court, we included some questions about the residents' basic demographic information. This part of our investigation included questions about residents' living arrangements, income, and when and why they moved to Washington Court. So as to better understand residents' responses to the main questions about the building, we also asked residents about their functional limitations, independence and need for assistance, and their finances. We also learned that the owners entered into an agreement with the Dubuque Visiting Nurses Association to deliver services to help residents with disabilities to live independently. The information we collected is summarized below as a portrait of the people of Washington Court.

Basic Demographics. Even some basic demographic information about the residents of a building can provide some clues about which design features to include in the building design. For example, a basic understanding of the residents' financial status and income level can help a landlord or building designer determine if a feature should be standard or if the resident could later absorb the costs associated with providing their own adaptive means. An example of this would be a low income resident who is burdened by having to buy a step-stool to reach items in the kitchen and would otherwise save money, time and energy if cabinets, storage, appliances and controls were mounted within easy reach. Similar inferences can be drawn from other demographic information such as age and whether a person lives alone or with a roommate or spouse.

From data we received from the landlord, we knew the building housed 45 residents in 36 apartments, nine of which were designated handicap accessible units. Out of this population, we conducted surveys with 27 residents. Five residents only completed part of the survey, so we dropped their responses in our final analysis, which resulted in our final sample of 22. Fifteen of those residents lived in one bedroom apartments, and seven lived in two bedroom apartments. Only three respondents lived alone, whereas nineteen shared their apartment with

someone else.¹ Furthermore, a majority of residents at Washington Court are single (63 percent single compared to 27 percent divorced or separated), while very few are married (9 percent). Most residents are under age 45 (63 percent), and only two respondents were over age 65 (9 percent).² The residents of Washington are similar in age distribution to the greater Dubuque area, which has an average age of 38.³

About 72 percent of respondents work, with 50 percent of residents working full time. In addition, 40 percent either attend school or plan to attend school in the near future. The building has off-street parking, and 68 percent of respondents report using a personal or family car for transportation. Additionally, roughly one-third of respondents use public transportation regularly.

As previously mentioned, Washington Court is a subsidized housing project and residents must meet specific income requirements in order to live there. Accordingly, we found that 23 percent of respondents receive Social Security retirement benefits. 14 percent receive Social Security Disability benefits, 18 percent receive Supplemental Security Income, and at least 14 percent receive food stamps or other government assistance. We also found that 18 percent of residents make less than \$10,000 annually, 32 percent of residents make between \$10,001 and \$20,000 annually, and 23 percent make between \$20,001 and \$30,000 annually. Nobody reported earning over \$40,000 annually.⁴

Residents had lived at Washington Court for varying amounts of time before we interviewed them, giving them a different perspective on the building depending on whether they had been there for awhile or just moved in. Half of the residents we interviewed moved to Washington Court between September and November 2007, so they had lived at Washington Court for over a year when we conducted our survey. Forty-five (45) percent of residents had lived there for less than one year. Only one resident lived at Washington Court for less than one month before we interviewed him (5 percent).

Functional Limitation Data. Although functional limitation data more easily translates into proposed building enhancements, it is also somewhat more difficult to capture. We included some questions about functional limitations in our survey of the residents of Washington Court because knowing about residents' functional limitations allows us to better understand why they may benefit from or value a particular accessibility or Universal Design feature. Put simply, this data provides an additional answer to the follow-up question "why" for each feature evaluation and response in the remainder of this study. However, functional limitation data is more difficult to obtain with simple pointed questions, in part because the definition of a functional limitation is highly subjective. Only a small group of people identify themselves as having some form of functional limitation, such as the permanently disabled. If we were to limit our study of functional limitations in a population to questions that produce this small group then we would have a very incomplete picture.

Accordingly, it is best to think of functional limitations in a population as a series of concentric circles, with the self-identified functionally limited in the smallest central circle. The next set of people can be identified through questions about the use of assistive devices, such as grabbers, and ease of performing daily tasks, like doing laundry. But Universal Design is supposed to take into account aging-in-place, passing injuries, fluctuating health and functioning and permanent

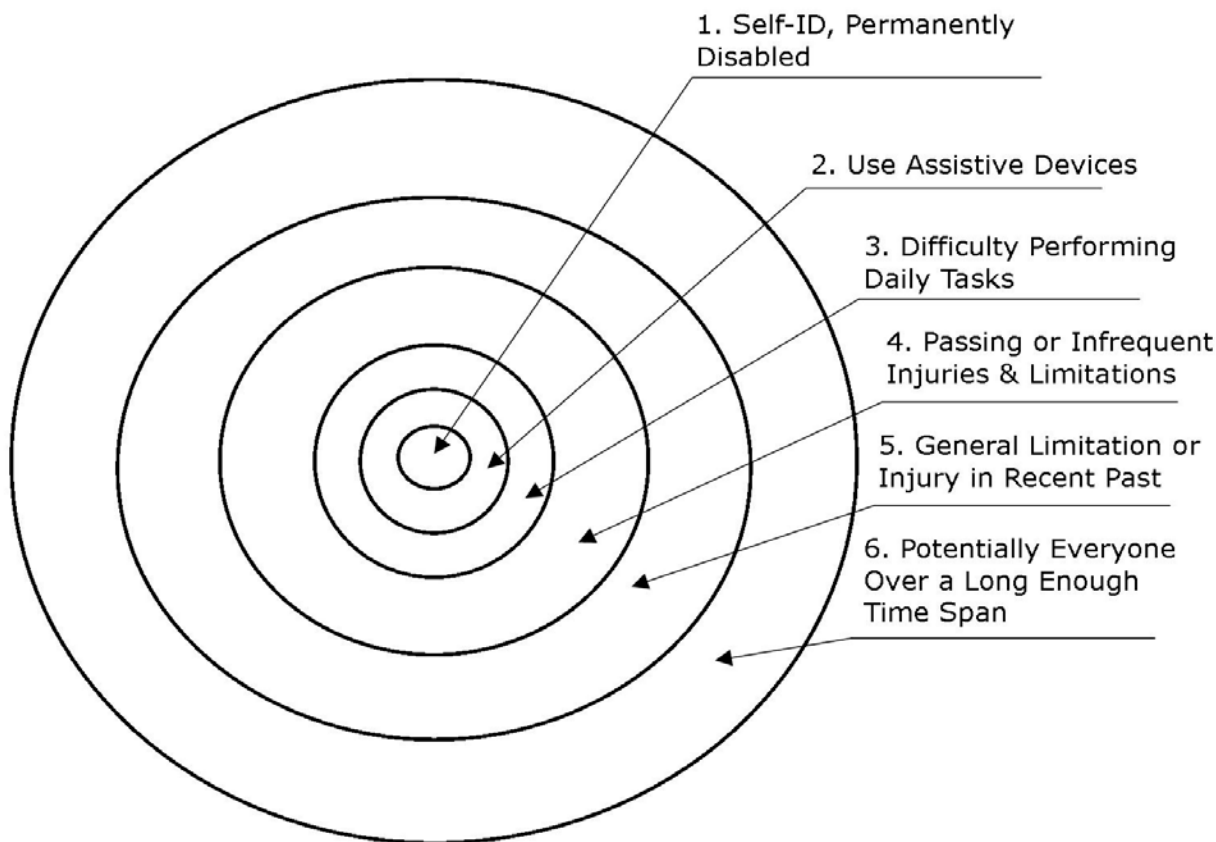
¹ This factors into frequency of use of certain features of the apartment and may be an indicator of functional limitations, assistance with daily tasks, and overall UD features as being adaptable to persons of different functioning levels in the same unit at the same time.

² It should be noted that more aged individuals may be underrepresented in this study.

³ US Census Data from 2000, available online at: <<http://www.census.gov/main/www/cen2000.html>>.

⁴ 9.1 percent refused to disclose income and 5 percent did not know their income.

impairments. So an appropriate line of questioning involves asking if an injury developed while living at Washington Court or if it was a preexisting condition and whether the resident needed assistive devices on a daily or passing basis. Asking more general questions about whether a person has suffered an injury or been limited in their ability to perform daily tasks in the past six months, year, and five years will finally result in a more complete picture of residents' limitations and abilities. Essentially, over a long enough timeline, everyone will have had some period when they had some functional limitation, difficulty with stooping, bending, walking, seeing, hearing, etc.



Here is what we found. Forty-one (41) percent of respondents informed us that they had some form of “functional limitation.” Some residents with functional limitations live in non-HC units. We only interviewed six residents living in HC units, but interviewed nine residents with a functional limitation.

Only six residents responded “Yes” to “Do you have any functional limitations?” However, more responded “Yes” when the functional limitations were more specific to an ability such as the seven who responded “Yes” to, “Do you have any trouble stooping or kneeling?” So, the total number of persons with a functional ability was determined by adding those who responded positively to the later questions about ability to the initial question about general functional ability. Most of those with functional limitations had problems stooping or kneeling (7 of 9, or 78 percent of residents with functional limitations), followed by trouble walking (6 of 9, or 67 percent), and then trouble reaching (5 of 9, or 56 percent). Four respondents (18 percent) reported having difficulty with “activities of daily living,” and 77 percent of respondents reported no problems with such activities. Four respondents (18 percent) also reported that their

functional limitation was “permanent or indefinitely recurring,” which means that their building evaluations will most likely not change due to a new betterment in their personal condition.

As previously mentioned, we further learned about respondents’ functional limitations in terms of three categories that relate to the type of assistive technology used in relation to a certain limitation. The three categories are limitations requiring use of mobility devices, limitations requiring use of manipulation devices, and limitations requiring use of communicative devices. Six respondents (27 percent) reported using mobility equipment such as wheelchairs, crutches, and walkers while living at Washington Court, and three of them reported using the equipment on a daily basis. Four respondents (18.5 percent) reported using manipulation devices such as reachers and grabbers, and only one of those respondents (4 percent) reported using such devices daily. One respondent reported using communicative devices while living at Washington Court in the form of a text telephone (5 percent). Another 12 percent of residents used orthotics or braces on a passing basis while residing at Washington Court.

We also defined the degree of a functional limitation according to whether residents’ moved to Washington Court with the limitation, or if the limitation developed while they lived at Washington. Eight respondents (36 percent) informed us that they used “assistive devices or equipment” before living at Washington Court. Of these respondents who had used such devices, five informed us that they used mobility devices (23 percent), and three of them used such devices on a passing basis (14 percent). Two respondents used “manipulation devices,” one on a daily basis and one on a weekly basis (5 percent, respectively). One respondent used “assistive communications equipment” on a daily basis (5 percent). Also, two residents reported using orthotics, braces, splints, or supports on a passing basis before moving to Washington Court (9 percent).

As a further measure of functional limitations, we asked respondents whether they needed assistance from others with personal care and daily activities both before and while living at Washington Court. Eighteen (18) percent of respondents said they needed assistance of this sort both before and while living at Washington Court. The most common person who provided such assistance was a family member, followed by a “home health care agency” (18 percent and 9 percent, respectively).

III. Survey Methodology

Many of our methodology choices were informed by three constraints. First, we were constrained by funding. Second, we were constrained by our research team members' relative lack of experience. Third, we were constrained federal regulation governing the way public institutions use humans in research studies. For a complete report on survey methodology, please see the Appendix section "Survey Methodology."

Our potential sample included all of the adult residents of the Washington Court Apartment building. We chose to survey Washington Court residents because we helped develop the building and have strong relationships with the building's owner and the city of Dubuque. We started with a list of official tenants provided by the landlord. We asked residents to provide names and contact information for other people living in their apartment so that we could interview any residents who were not on the landlord's tenant list. In at least one case we discovered an unofficial resident because that person was the only one who ever answered the phone (even though she was not listed on the landlord's tenant list). Every adult tenant had an opportunity to participate because of (mailings, fliers—option to call us).

We limited the sample to adults for practical purposes. The Human Subjects Review Board at the University of Iowa requires special approval for studies involving minors. We did not anticipate collecting enough information from minors at Washington Court to justify asking for special permission to interview them. In fact, it appears that there are very few minors living at Washington Court, and the few minors who do live there are under the age of five.

We compensated survey participants to order increase our sample size. Participants received a \$10.00 gift card for the Eagle Country Market, a grocery store across the street from the apartment complex. The IRB required us to mail a gift card to all residents who began the survey regardless of how many questions the respondent answered. The compensation was not pro-rated. In some cases, multiple residents from a single apartment unit took the survey. Each participant received a gift card even if another resident from their apartment had received compensation for agreeing to participate in the survey.

The greatest methodological weakness of the survey was small sample size. The scope of the survey was limited to residents of Washington Court, which is a relatively small pool.

Because of the small sample size, it was more difficult to generalize our findings. In an attempt to mitigate the problem presented by the small sample pool, we tried our best to maximize our return rate of the pool. We used several strategies for this. We drafted and practiced non-coercive persuasion language, in order to have ready responses to respondents who were undecided or unenthusiastic about taking the survey. We met with a phone survey specialist at the University of Iowa and discussed with her techniques for reaching people, persuading people to take the survey, and getting the most thoughtful responses from respondents. Despite these strategies, it was not feasible to get a response from every single resident, which compounded the difficulties presented by the small sample size, which consisted of 22 residents who completed both interview sessions or sets of questions.

We did not encounter any respondents who did not speak English. If we had anticipated that a substantial portion of tenants did not speak English as a first language, we might have prepared a translation of the survey and found a multilingual research team member to make those calls.

Another difficulty we encountered was the fact that the bulk of our calls were made during normal working hours. Because many potential respondents worked outside the home, they were often not available to take the phone survey when we called. We responded to this by

making cold calls on evenings and weekends, when people who work outside the home are more likely to be available. We also scheduled specific times to take the survey with people for times outside of normal business hours. When leaving messages for people, we also let them know that they could request a time to take the survey which was outside normal business hours. It was also particularly helpful when we had cellular phone numbers for respondents.

IV. Survey Results

Residents are divided over the benefits of universal design (UD). One group of residents values universal design features, while the second group is apathetic towards UD features. Residents who value UD notice the features, use them, and find them important. These residents would like additional UD features. On the other hand, residents who are apathetic towards UD have not noticed the features, do not use them, and are indifferent towards adding more UD features to the building. The ratio of residents who value UD and apathetic residents is almost one-to-one.

Universal design gives Washington Court a long-term competitive advantage over other subsidized housing. Washington Court stands out from other affordable housing because it is new and because of its universal design features. Residents who value UD chose Washington Court over other subsidized housing options in part because of the UD features. Residents who are apathetic towards UD chose Washington Court because it is a new building, regardless of the UD features. Thus, Washington Court will maintain its competitive advantage over Section 8 and other housing even as the building ages because it will continue to attract residents who value UD features.

Developers can use and expand on the Washington Court model in three ways to increase their competitive advantage in the affordable housing market. First, developers can add features that all residents want, regardless of whether they value or are apathetic towards UD. These include security features, energy efficient appliances, storage space for large items, and extra lighting.

Second, developers can add discrete universal design features that will attract residents who value UD without deterring apathetic residents. Developers should add these features throughout a building and in every unit to attract residents who value UD. Many of these features are also relatively inexpensive. They include construction practices such as mounting electrical outlets and cable jacks higher and the thermostat lower, using C-shaped door handles instead of round knobs, and leaving clear space under the kitchen sink and cooktop.

Finally, developers can add obvious UD features in select apartments. Even though these features are more expensive to install, there is a distinct market for them. Demand for these units will continue even after the building ages because residents who value UD will actively seek out these units. These features are in addition to those listed in the last section and include a raised oven and dishwasher, a roll in shower, and pre-installed grab bars in the bathroom.

A. Moving Motivations

Residents were attracted to the building first and foremost because it was affordable. Our survey results suggest that the factors that make Washington Court stand out from other subsidized housing is that the building is secure, clean and new, the apartments are large and well designed, and it has UD features. In the words of one resident, Washington Court was “a lot better than my last place!”

Not surprisingly, residents were attracted to Washington Court because the apartments are affordable. Many residents cited the low rent when asked to explain why they chose this building. The amount of rent ranked fourth on a list of features that drew residents to Washington Court (6.05 out of 7). The energy efficient utilities and appliances, which also contribute to affordability, ranked third (6.23 out of 7). One resident said that she was attracted

to the building because it has a new water heater. Another said that he liked “the modern appliances.”

The price of rent is a necessary condition for residents who receive housing subsidies. Residents ranked available off street parking and the size of the apartments above the amount of rent as factors that motivated them to move to Washington Court. Available off street parking may outrank rent because it is also a necessary condition. Sixty-eight (68) percent of residents have a car. Residents may have ranked the size of the apartments above the amount of rent because the size of the apartments sets Washington Court apart from other subsidized housing.

Security is a major issue. Residents said they like the secure front entrance, especially the now defunct security code to access the front door. Residents also like the security cameras throughout the building. A few residents said that Washington Court is unique compared to places they previously lived in because it has better security.

- *We felt that Washington Court was clean, affordable, and secure.*
- *The fact that it was a secure building.*
- *I also like that it was a secure building, because I live alone.*
- *Security cameras and locked doors are great.*
- *I also liked that it had security at the time, or at least it used to have better security.*

Many residents said that they moved to Washington Court because it is a new building and because it is clean. Living in a newly renovated building is more important to residents than living in a historical building (6.05 compared to 4.27). Most residents said the building is unique compared to places they had lived before because it is a newly renovated building.

- *I liked that it was a new building.*
- *The fact that everything was new.*
- *That it was new.*
- *It's brand new...*
- *Everything was new, nice and clean... really appreciated the cleanliness.*
- *I love that it was brand new.*
- *We felt that Washington Court was clean, affordable, and secure.*
- *It was recently remodeled*

Residents are also attracted to the building because of the apartments' size, layout, and design. The size of the apartments is the top ranked attraction (6.59 out of 7). They moved because it is “huge,” and “gorgeous.” Residents also raved about “the layout and modern look.” The apartments' design will likely continue to draw residents even as the building ages.

Some residents moved to Washington Court because of its UD features. Three residents specifically said that they moved there because of the accessibility features. A group of residents said that the handicapped accessible apartments (10 out of 22, 45 percent), the ramped entrance to the building (9 out of 22, 41 percent), and the Crescent Community Health Center on the ground floor (7 out of 22, 32 percent) were very important factors in their decision to move to Washington Court. On average, however, these features did not rank highly among residents' motivations to move to Washington Court because the other 12 to 15 residents were more likely to respond that these features did not factor into their decision to move to Washington Court at all.

- *Earlier this year I broke my leg and I appreciate how accessible this building was.*
- *I was attracted to the universal housing design features.*
- *The handicap accessibility.*

<p>Moving Motivations: The Building's Features <i>I am going to read you a list of features that describe Washington Court. On a scale of one to seven, please tell me how important each feature was in your decision to move to Washington Court. A one means that the feature was not important to you at all, a four means that the feature was somewhat important, and a seven means that the feature was one of the most important reasons you decided to move to Washington Court.</i></p>	Base	Average	Standard Dev.
TOTAL	22	5.015	1.0891
The size of the apartments	22	6.59	0.796
Available off-street parking	22	6.55	0.800
The energy efficient utilities and appliances	22	6.23	1.270
The amount of rent	22	6.09	1.019
Living in a newly renovated building	22	6.05	1.527
The building's front doors, which can open automatically	20	5.55	2.064
The ramped entrance to the building	22	4.82	2.538
Original factory features throughout the building	22	4.73	2.074
The handicapped accessible apartments	22	4.64	2.574
Living in a historic building	22	4.27	2.511
Crescent Community Health Center on the ground floor	20	4.20	2.567
Project Concern on the ground floor	21	3.90	2.385
The neighborhood	22	3.82	1.991
The second floor social room and community kitchen	21	2.86	2.197

Overall, the buildings' features were more important to residents in their apartment search than the buildings' location. One resident remarked, "I love the building, I love the apartment, don't like the neighborhood."

The neighborhood has some draws. Residents particularly like being so near to the grocery store. They ranked proximity to a grocery store the second most important neighborhood feature (5.36 out of 7). Residents also ranked being close to their place or work and friends as important location considerations (5.39 and 4.95 out of 7, respectively).

- *It was near the grocery store, and a better location than where I was before.*
- *I liked the convenient location for the grocery store*
- *It was very convenient for my job.*
- *Gas station, fast food*
- *There are good fast food and gas stations nearby.*
- *I like the casino, and that it's within walking distance.*
- *Being by the river was important to me. Also, being close to the casino.*
- *The Crescent Community Health Center, also that it is close to my job.*

<p>Moving Motivations: The Building's Location <i>On a scale from one to seven, please tell me how much the proximity of each of the following places or services factored into your decision to move to Washington Court. A one means that the proximity of a place or service was not important to you at all, a four means that the proximity of that place or service was somewhat important, and a seven means that the proximity of the place or service was among the most important reasons you decided to move to Washington Court. If the place or service doesn't apply to you, please say so.</i></p>	Base	Average	Standard Dev.
TOTAL	22	4.203	1.761
Your place of work	18	5.39	1.975
A grocery store	22	5.36	2.083
Your friends	20	4.95	1.791
Your place of worship	19	4.32	2.770
Your family members	20	4.15	2.739
Parks, walking paths, or other recreational opportunities	22	4.14	2.315
Hospitals and health services in the area	22	3.91	2.486
City bus lines	22	3.32	2.679
Shopping centers or malls	21	3.38	2.312
The post office	22	3.23	2.389
Government services and agencies	20	3.10	2.426
Entertainment opportunities live movie theaters	21	2.52	1.778

Residents were not concerned about their proximity to government services and agencies, the post office, or entertainment opportunities. This may be because residents do not think that these services are close enough to Washington Court to factor into their decision-making. Alternatively, perhaps residents do not value these services as highly because they go to the government offices, post office, and movie theater less often than they go to the grocery store, work, or to visit friends. It is also important to note that most residents have a car (63 percent).

B. Living at Washington Court

Residents are generally satisfied with their living experience so far. Thirteen residents (60 percent) say that they are very satisfied with their living experience, and eight (36 percent) say that they are somewhat satisfied. However, when asked to describe their living experience in their own words, residents' provide a more moderate response. Most said their experience has been "pretty good" or "okay." Their reservations seem to come from their relationship with the building's other residents and the neighborhood.

- *[What I like least about the building is] the neighborhood, the neighbors.*
- *I would say that there have been problems with other renters in the building, and they took away our security code access for the front door. It's really a problem that they took that code away. Overall, mostly great. The owners are really awesome.*
- *Things went a lot better before it was so full; people were more respectful than they are now.*
- *The apartment's great, but the floors are a little thin, however.*

Not surprisingly, residents like the features that they chose the building for. They like the security features, the size and layout of the apartments, and the building's historic character. Residents' biggest complaint about the building is that the security codes for the front entrance no longer work. Features that residents like least about the building include the thinness of the walls, the elevator, and the laundry rooms.

Residents are most displeased with the security code for the front entrance. Residents really liked that they could use the security code to unlock the front entrance. They dislike having to use keys and not being able to "buzz" in guests. Many residents said that if they were landlord for a day, they would reinstall the security code access.

- *[The thing I like least about the building is] the fact that you can't use your security code anymore.*
- *Nice to have access code, we should have the code*
- *[If I were landlord for a day] I'd definitely get the front door working again! It is very hard for me to enter by just using the key.*
- *[If I were landlord for a day] I would replace the access code to the front door so that people who are handicapped can get in without trouble.*
- *[If I were landlord for a day] I would make the security code work again.*

Other residents are concerned that the walls are too thin. These residents said that if they were landlord for a day, they would put more insulation in the walls. A handful of residents commented that the elevators do not work consistently and that this is a problem for people in wheelchairs. Some wanted a second elevator or a freight elevator. Finally, a group of residents

said that they did not like the laundry room and would install washers and dryers in each unit if they were landlord for a day.

C. Accessibility and Universal Design Features

Residents are divided over the benefits of universal design. One group of residents values universal design features, while the second group is apathetic towards UD features. Residents who value UD notice the features, use them, and think that they are important. These residents would like additional UD features. Residents who are apathetic towards UD have not noticed the features, do not use them, and are indifferent towards adding more UD features to the building. A few "cross-over" features unify residents; the consensus is that these features are either very important to everyone, or not important to anyone.

The ratio of residents who value UD and apathetic residents is about one-to-one. Among residents who live in HC units, half regularly say that the accessibility and UD features in their apartments are important to them (three out of the six). Similarly, half non-HC residents say that the accessibility and UD features in the common areas are important to them (eight out of 16). Two-thirds of residents who live in HC units say that additional UD features would be important to them (four out of six). Slightly less than half of non-HC residents say that additional UD features would be important to them (seven out of 16).

Appearance and Floor Plan. Residents like the way their apartments look (95 percent). They also like the original factory features such as the exposed brick and wood beams. However, a drawback to living in a historical building is that the original factory windows are heavy. Residents want windows that they can open and close with little physical effort (6.05 out of 7).

Even residents in HC units like the way their kitchen and bathroom look, complete with UD features (five out of six, or 83 percent). They do not notice discrete UD features like the mounting for the electrical outlets, thermostat, and light switches. Nor do residents mind the way more obvious UD features look, like the mounting for the dishwasher and oven.

Residents like the layout of the apartments. Half of the residents say the open floor plan is very important to them, and another 41 percent state that the open floor plan is somewhat important to them. Only one resident reported having trouble moving around the apartment, explaining that "the door leading from the living room to the bedroom is on the wrong side and it interferes with the entrance to the bathroom."

Kitchen. HC units have accessibility features that the non-HC units do not have. For example, the oven and dishwasher are mounted a few feet off the ground for easy access. The space under the cooktop and sink is open to accommodate residents who use wheelchairs. The cooktop controls, garbage disposal switch, and exhaust fan switches are mounted on the front of the counter instead of at the back. HC residents also have a side-by-side refrigerator and freezer instead of a traditional "freezer on top" appliance. The purpose of these features is to improve access for residents of all abilities.

There is a clear division between residents who need UD features and think they are important and residents who do not need UD features, do not notice them, and do not think they are important. For instance, three HC residents say that it is very important to them that there is clear space under the cooktop and sink. The other three say that it is not important (except for one person who said that it is somewhat important that there is clear space under the cooktop). No one has a problem using the clear space. Two residents use the clear space for their knees. Other residents use it for storage, the garbage can, or do not use it at all.

Similarly, three HC residents say that it is very important to them that the oven and dishwasher are raised off the ground, compared to two who say that it is not important and one who says it is only somewhat important. Three residents say that it is very important to them that the switches for the garbage disposal, exhaust fan, and cooktop light are mounted on the front of the counter instead of at the back. Two residents say that it is not important to them where these switches are mounted, and one says that it is only somewhat important. No one has a problem using the oven, dishwasher, or switches as they are currently mounted.

The side-by-side refrigerator and freezer is an exception. Four HC residents say that the side-by-side fridge and freezer is very important to them. One resident says that the fridge and freezer set up is somewhat important, and only one resident says that it is not important at all. The fridge and freezer may have crossover appeal because residents who do not value UD see it as a high-end appliance.

How important is it to you that..	Base	Very Important	Smwt Important	Not Important
The fridge is a side-by-side model rather than a traditional model with the freezer on top?	6	4 (66.7%)	1 (16.7%)	1 (16.7%)
There is clear space under the sink?	6	3 (50%)	0	3 (50%)
That there is clear space under the cooktop?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The oven is raised?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The dishwasher is raised?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The switches for your garbage disposal exhaust fan and cooktop light are mounted on the front side of the counter instead of at the back?	6	3 (50%)	1 (16.7%)	2 (33.3%)

*The number represents the frequency, and the percent represents the frequency over the base.

For the most part, residents report that they are able to access easily all of the areas of their kitchen. The kitchen sink, cooktop, dishwasher, and oven are the easiest areas to access. Five out of six HC residents say that these areas are very easy to access, while another HC resident says that these areas are somewhat easy to access. The refrigerator and freezer, counter space, and lower cabinets are harder to reach. Although five out of six individuals say that these areas are very easy to access, another HC resident says that these areas are only somewhat or not easy to access. In each case, the resident who has trouble accessing the kitchen area uses a mobility device such as a scooter, wheelchair, or crutches.

The upper cabinets are the hardest to reach. Only three out of six said that the upper cabinets were very easy to reach, two said that they were somewhat easy to reach, and one said that the upper cabinets were not easy to reach. The three residents who have trouble reaching the upper cabinets have all use a mobility device.

How easy is it to access the...	Very Easy	Smwt Easy	Not Easy
Oven	6 (100%)	0	0
Kitchen sink	5 (83.3%)	1 (16.7%)	0
Cooktop	5 (83.3%)	1 (16.7%)	0
Lower cabinets	5 (83.3%)	0	1 (16.7%)
Fridge and freezer	5 (83.3%)	0	1 (16.7%)
Counter space	5 (83.3%)	0	1 (16.7%)
Dishwasher	4 (66.7%)	1 (16.7%)	0
Upper cabinets	3 (50%)	2 (33.3%)	1 (16.7%)

*The number represents the frequency, and the percent represents the frequency over the base.

Residents in standard and HC units want kitchens with more lighting and flexible work and storage space. They say that under-cabinet lighting would be somewhat important to them (4.90 out of 7). For flexible workspace, residents would like cutting boards that pull out from underneath the counter top (4.82) and counter tops at varied heights (4.09). They also prefer rounded counter tops (4.73). For flexible storage space, residents would like a side-by-side refrigerator and freezer (4.06) with shelves that pull out (4.00), and upper cabinets that are mounted lower (4.00).

Universal design features make up a second set of kitchen features that some residents want. Again, there is an almost one-to-one split between residents who value UD and those who are apathetic towards it. Eight residents say that it would be very important to them to have an oven, microwave, or other appliances with doors that open to the side instead of from the top (36 percent), while ten residents say that this feature would not be important to them at all (45 percent). Five residents say that it would be very important to have oven and cooktop controls mounted on the front instead of at the back (22 percent), while six residents say it is not important to them at all where the controls are mounted (27 percent). Finally, six residents said that it would be very important to have open space or knee space under the sink, cooktops, and counters (27 percent), while seven residents said open space was not important at all (31 percent).

Additional Kitchen Features <i>We're trying to find out what people are looking for in an apartment. Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i>	Base	Average	Standard Dev.
TOTAL	22	3.94	1.716
Under-cabinet lighting to light the countertops	21	4.90	2.300
Cutting boards that pull out from underneath the counter top for extra workspace	22	4.82	2.383
Counters with rounded edges	22	4.73	2.434
A sink with the drain, garbage disposal, and piping further towards the back to allow more clear space underneath	21	4.29	2.630
Counter tops or work surfaces at varied heights	22	4.09	2.671
A side-by-side refrigerator-freezer	16	4.06	2.645
Upper kitchen cabinets that are mounted lower than usual	22	4.00	2.410
A refrigerator with shelves that pull out	22	4.00	2.370
Open space or knee space under the sink, cooktops, and counters	22	3.95	2.554
Garbage cans or recycling bins on pull out drawers in lower cabinets	22	3.91	2.428
Single lever faucets	21	3.86	2.393
An oven, microwave, or other appliances with doors that open to the side instead of folding down	22	3.82	2.519
Shelves that pull out from lower cabinets	22	3.82	2.500
An oven, cooktop, or other appliances that have their controls mounted on the front or side instead of at the back	16	3.75	2.646
A rolling cart to transport food on	22	3.36	2.361
Controls for the range hood fan and garbage disposal mounted on the front of the counter instead of at the back	16	3.00	2.366
A dishwasher, oven, and other appliances that are raised to discourage bending	16	3.00	2.530
Lazy Susan shelves in corner cabinets	22	2.95	2.360

Bathroom. HC-unit bathrooms have grab bars installed. There are no grab bars in the non-HC units, and non-HC residents cannot ask to have them installed because there is not enough support in the walls to mount the grab bars. Aside from the grab bars, the HC and non-HC bathrooms are identical. Residents in either HC or non-HC units can ask the landlord to install a shower seat.

Four out of six HC residents use the grab bars in the bathroom to balance or to transfer to the shower or toilet (67 percent). The grab bars are very important to these four residents (67 percent), but not important at all to the other two HC residents (33 percent). None of the four HC residents who use the grab bars have problems using them. At least one non-HC resident asked the landlord to install grab bars in his bathroom, but was refused because there is not enough structural support in the walls to mount the grab bars to.

The bathroom design presents challenges for residents in wheelchairs. One wheelchair user has problems using the vanity and mirror because “it is a little high”. This resident has also installed a shower seat. It is very important to him and he has no problems using it.

Residents would like their bathrooms to have more lighting (5.14 out of 7) and a full-length mirror mounted on the wall (5.43). Non-NC residents would also like grab bars near the tub, shower and toilet (4.69). Surprisingly, residents also think it is important to have a roll in shower instead of a combination tub and shower even if they would not personally need a roll-in shower (4.68). Residents who value UD say that this is a very important feature. Only five residents say it would not be important to have a roll-in shower (22 percent).

Bathroom Features <i>Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i>	Base	Average	Standard Dev.
TOTAL	22	4.71	1.779
A full-length mirror mounted on the wall	21	5.43	2.315
Extra lighting in the bathroom	22	5.14	2.210
Non-slip flooring in the bathroom	21	5.14	2.435
Grab bars near the tub, shower, and toilet	16	4.69	2.774
A roll in shower instead of a tub and shower combination	22	4.68	2.212
A bench or platform at the head of the tub to use to enter the tub or to place personal care items on	16	4.63	2.419
Adjustable height shelves in the bathroom	22	4.36	2.441
A vanity with counters at varying heights	22	4.23	2.544
Toilets that are 18 inches tall instead of the standard 14 inches	22	4.14	2.455

General Apartment Features. HC residents have not noticed that their apartments' light switches, electrical outlets, and thermostat are mounted differently. Again, there is an almost even ratio between residents who value UD and residents who are apathetic towards it. Three HC residents say that it is very important that the light switches are mounted lower than usual and three say that it is not important at all. One HC resident has trouble using the light switches, explaining, "Sometimes the switches are hard to reach and there are not enough of them." Even fewer HC residents say that it is very important that the electrical outlets are mounted higher than usual (two out of six). One resident has problems using the electrical outlets because "some of the outlets don't work unless the master switch is turned on."

Only one HC resident says that it is very important that the thermostat is mounted lower than usual. Four HC residents say that how the thermostat is mounted is not important. This may stem from the fact that the digital thermostat itself is easier to use than an analog thermostat. In fact, non-HC residents say they would like a thermostat with a large digital display (5.32 out of 7).

How important is it to you that..	Base	Very Important	Smwt Important	Not Important
The electrical outlets are mounted higher off the ground than usual?	6	2 (33.3%)	0	4 (66.7%)
The bedroom and bathroom doors have lever style handles instead of round knobs?	6	2 (33.3%)	2 (33.3%)	2 (33.3%)
The electrical outlets are mounted higher off the ground than usual?	6	2 (33.3%)	0	4 (66.7%)
The thermostat is mounted lower than usual?	6	1 (16.7%)	1 (16.7%)	4 (66.7%)

*The number represents the frequency, and the percent represents the frequency over the base.

Non-HC residents would also like digital light switches with dimmers (5.18 out of 7) and phone and cable jacks in multiple places around the home (5.14). These are crossover features that appeal to residents who are generally apathetic towards UD. It is not important to non-HC residents how the electrical outlets (2.87), thermostat (2.62), and light switches (2.62) are mounted.

General Features <i>Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i>	Base	Average	Standard Dev.
TOTAL	22	4.62	1.291
Peepholes in the front door for security	22	6.41	1.436
Windows that can be opened and closed with little physical effort	22	6.05	1.527
A thermostat with a large digital display	22	5.32	1.887
Light switches with dimmers	22	5.18	1.967
Phone and cable jacks in multiple places around the home	22	5.14	2.295
Doors with a keyless entry system such as a card swipe or remote control	22	5.00	2.545
A fire alarm with flashing strobe lights and a warning siren	22	4.95	2.236
A doorbell	22	4.77	2.468
Lever-style door handles	16	4.06	2.489
Backlit light switches	22	3.86	2.122
Rocker-style light switches	22	3.64	2.258
Multiple peepholes at varying heights	22	3.27	2.658
Electrical outlets and other jacks that are mounted higher off the ground than usual	16	2.87	2.125
A thermostat and light switches mounted lower than usual	16	2.62	2.187

Storage Space. Residents in both HC and non-HC units say they have enough closet space in their apartments (77 percent). Seventy-two (72) percent of all residents use their utility room for extra storage. Sixty-three (63) percent say that it is very important that there is room to store things in the utility closet. Eighteen (18) percent report problems using the utility room for storage. In most of these cases, management has asked the residents to stop using their utility room for storage because it violates the fire code.

How important is it to you that...	Base	Very Important	Somewhat Important	Not Important
There is room to store things in the utility closet?	22	14 (63.6%)	3 (13.6%)	5 (22.7%)
The clothes rods in your closets are mounted lower than usual?	6	3 (50%)	1 (16.7%)	2 (33.3%)
Your closets have bi-fold doors instead of regular doors?	6	2 (33.3%)	0	4 (67.7%)

*The number represents the frequency, and the percent represents the frequency over the base.

HC units have some unique closet features, including clothing rods that are mounted lower than usual, bi-fold doors, and lever style door handles. Three HC residents say that it is very important to them that the clothing rods in the closets are mounted lower than usual, compared to two HC residents who say it is not important. One HC resident has a problem using his closets because the shelves are too high, while another has problems sliding hangers on the closet rack.

The other closet features are not particularly important. Two HC residents say that the lever-style handles on some of the closet doors are very important to them, two say that the handles are somewhat important to them, and two say that the style of handles is not important to them (33 percent each). Four HC residents say that the bi-fold doors are not important to them at all (67 percent). One person has a problem using the bi-fold doors because his "wheelchair gets in the way of the closet door."

Closet Space Features <i>Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i>	Base	Average	Standard Dev.
TOTAL	22	4.11	1.666
Lights in all of the closets	21	5.67	2.033
Lights that come on automatically when you open the closet door	22	4.68	2.234
Adjustable height shelves in the closets	16	4.38	2.604
Adjustable height clothes rods in the closets	16	4.00	2.633
Closet doors with C-shaped handles instead of knobs	21	3.67	2.415
Light switches for the closet lights both inside and outside of the closets	22	3.50	2.385
Electrical outlets in the closets	22	2.77	2.202

*The number represents the frequency, and the percent represents the frequency over the base.

Residents would like more lighting in their closets (5.67 out of 7), and they would like the lights to come on automatically when they open the closet door (4.68). Residents would also like more flexible closet storage space, including adjustable height shelves (4.38) and clothing rods (4.00).

Common Areas. The common areas of Washington Court have many accessibility and UD features. The laundry room on each floor has front loading washers and dryers. A social room and community kitchen on the second floor encourage residents to interact. A number of security features, including cameras in the hallways and outside of the building and the secured front entrance, help residents feel safe. There is a ramp and a stairway up to the front entrance door, which has an auto-open button. The front entrance also features an intercom system to “buzz” in guests. Finally, the garbage dumpster is designed to be wheelchair friendly. A raised walkway with an accessible ramp surrounds the dumpster so that people can throw out their trash without having to lift it above their heads. Residents use and value some of these features, but other features present problems.

How important is it to you that...	Base	Very Important	Smwt Important	Not Important
Your building has a secured entrance?	22	21 (95.5%)	0	1 (4.5%)
There are laundry facilities in your building?	22	19 (86.4%)	1 (4.5%)	2 (9.1%)
The front doors can open automatically?	22	13 (59.1%)	6 (27.3%)	3 (13.6%)
There is a ramp that you can use instead of the stairs?	22	11 (50%)	7 (31.8%)	3 (13.6%)
There is an intercom system to buzz guests in?	22	10 (45.5%)	4 (18.2%)	6 (27.3%)
There are front loading washers and dryers?	22	8 (36.4%)	6 (27.3%)	8 (36.4%)
There are benches around three sides of the table and that there is open space on the fourth side?	22	5 (22.7%)	7 (31.8%)	8 (36.4%)
There is a social room in the building?	22	1 (4.5%)	5 (22.7%)	16 (72.7%)
There is a community kitchen?	22	1 (4.5%)	5 (22.7%)	16 (72.7%)

*The number represents the frequency, and the percent represents the frequency over the base.

Residents like the building’s security features. They like the security cameras in the hallways and on the outside of the building. They would like to have a security camera in the elevator. They also want peepholes in their apartment doors for added security (6.41 out of 7).

The most popular security feature is the front entrance. Ninety-five (95) percent of residents say that it is very important to them that the building has a secured front entrance. Residents strongly prefer to use the security code to open the front door rather than their keys. They want doors with a keyless entry system, such as a card swipe or remote control (5.00 out of 7.00). Residents say that they have problems using the front door since the management disabled the security code. Management disabled the code because residents were giving it out to non-residents.

Aside from the security issue, residents like the front entrance. They frequently use the auto-open button for the front door and the ramp. Thirty-six (36) percent use it all the time, and 55 percent use it sometimes. Even though most residents do not use the intercom system to “buzz” guests in (82 percent), they say that this feature is important to them anyway (important to 63 percent overall). Some residents reported that the intercom system is disconnected and does not work, which may be why they reported not using it.

Almost all residents use the auto-open button for the front door. One-third (36 percent) use it all the time. Over half (54 percent) use it occasionally. Sixty (60) percent say that it is very important that the front doors can open automatically. Another 27 percent say that it is somewhat important that the front doors can open automatically (important to 67 percent overall). One resident has a problem using the auto-open button; this resident is concerned that the door does not close quickly enough to be secure. Another resident has a problem using the interior front door; this door is too heavy for the resident to open.

Half of residents use the ramp at the front entrance, including 18 percent who always use the ramp and 41 percent who use it occasionally. Residents who use the ramp say that it is very important to them (50 percent). Another 32 percent say that the ramp is somewhat important (important to 82 percent overall). Only three residents (14 percent) say that the ramp is not important at all.

Residents like the convenience of having a laundry room on their floor. The closer, the better! Eighty-two (82) percent of residents do their own laundry. Eighty-six (86) percent say that it is very important to them that there is a laundry room in their building. Some residents suggested that they would prefer to have a washer and dryer in their apartment.

Residents are less concerned about whether the washers and dryers are front or top loading. Only 36 percent say it is very important that the washers and dryers are front loading, but another 27 percent say that it is somewhat important (important to 68 percent overall). Only two residents report problems using the washers and dryers. One said that the coin slots are difficult to reach because they are too high. The other said that the laundry facilities are too expensive to use.

If washers and dryers in individual apartments are not a possibility, then residents would make a number of changes to the laundry rooms to make this chore more convenient. They want an adjustable height counter for folding laundry (4.64 out of 7), wheeled carts for moving laundry (3.95), and an adjustable height sink (3.73). Residents would also make the laundry rooms larger, add seating, and install more washers and dryers.

Laundry Features			
<i>Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i>	Base	Average	Standard Dev.
TOTAL	22	4.77	2.468
An adjustable height counter for folding laundry	22	4.64	2.441
An intercom or emergency signal system	22	4.05	2.591
Wheeled carts for moving laundry in the laundry room	22	3.95	2.734
An adjustable height sink	22	3.73	2.622

Residents are indifferent about the dumpster setup. Eighty-six (86) percent of residents take out their own garbage. Twenty-one (21) percent of them report having problems using the dumpster. Many of these residents find that the dumpster is too high or too far away from the curb. One resident states that the handle on the door to the dumpster is hard to open. The dumpster is not a problem for the other 79 percent of residents.

Finally, the social room and community kitchen are not popular features. Only three residents have used the social room on the second floor (14 percent). They use it for entertaining during the holidays and hosting showers. No one uses the community kitchen. One of the three residents who use the social room expressed interest in using the community kitchen, but has problems using it because the door is locked. Even though only three residents use the community room, six say that it is important to them that there is a community room and kitchen (27 percent). Only one resident says that it is very important that there is a community room and kitchen (5 percent).

V. Conclusions

Developers can surpass the Washington Court model in three ways to increase their competitive advantage in the affordable housing market. First, developers can add features that all residents want, regardless of whether they value or are apathetic towards UD. The features include:

- Security features, such as a secured front entrance with a security code, security cameras throughout the building, and peepholes in apartment doors.
- An open layout with large living space and large bedrooms.
- Windows that residents can easily open (especially in rehabbed historical buildings).
- A walk in closet or utility room for storing large items.
- Extra lighting through the unit, including an overhead light in every room.
- Energy efficient appliances.
- Under-cabinet lighting in the kitchen.
- Rounded counter top edges in the kitchen and bathroom.
- Lots of flexible work space in the kitchen, including counter tops at varying heights and cutting boards that pull out from underneath the counter top.
- A side-by-side refrigerator and freezer with pull-out shelving.
- A full-length mirror mounted on the bathroom wall.
- A washer and dryer in each apartment.
- Alternatively, if there are laundry rooms, counters at varying heights for folding clothes.
- A buzzer at the front door to buzz guests in.

Second, developers can add discrete universal design features that will attract residents who value UD without deterring residents who are apathetic towards it. Developers should add these features throughout the building to attract residents who value UD to every unit. Many of these features are also relatively inexpensive. They include:

- Clear space under the sink and cooktop
- Backlit, rocker-style light switches with dimmers mounted lower than usual.
- Electrical outlets and cable jacks mounted higher than usual.
- A thermostat with a large digital display mounted lower than usual.
- Switches for the garbage disposal exhaust fan and cooktop light mounted on the front side of the counter instead of at the back.
- Lever style door handles throughout the building instead of round door knobs.
- Adjustable height shelves and clothes rods in the closets.
- Bi-fold closet doors.
- In-wall backing for bathroom grab bars pre-installed so that grab bars can be added upon request.
- Non-slip flooring in the bathroom.
- Front loading washers and dryers
- A ramp at the front entrance.
- Front entrance doors that open automatically.

Finally, developers can add obvious UD features in select apartments. Even though these features are more expensive to install, there is a distinct market for them. Demand for these units will continue even after the building ages because residents who value UD will seek these units. These features are in addition to the features listed in the last section and include:

- Upper kitchen cabinets mounted lower than usual.
- Oven and dishwasher mounted off the ground.
- Grab bars in the bathroom already installed.
- A roll-in shower with a shower seat.

Here are the compiled numbers and charts that illustrate the features that are important to the residents of Washington Court, and those that are not.

How important is it to you that...	Base	Very Important	Smwt Important	Not Important
How important is the shower seat to you?	1	1 (100%)	0	0
Your building has a secured entrance?	22	21 (95.5%)	0	1 (4.5%)
There are laundry facilities in your building?	22	19 (86.4%)	1 (4.5%)	2 (9.1%)
The fridge is a side-by-side model rather than a traditional model with the freezer on top?	6	4 (66.7%)	1 (16.7%)	1 (16.7%)
How important are the [bathroom] grab bars to you?	6	4 (66.7%)	0	2 (33.3%)
There is room to store things in the utility closet?	22	14 (63.6%)	3 (13.6%)	5 (22.7%)
The front doors can open automatically?	22	13 (59.1%)	6 (27.3%)	3 (13.6%)
Your apartment has an open floor plan?	22	12 (54.5%)	9 (40.9%)	1 (4.5%)
There is a ramp that you can use instead of the stairs?	22	11 (50%)	7 (31.8%)	3 (13.6%)
That there is clear space under the cooktop?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The dishwasher is raised?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The switches for your garbage disposal exhaust fan and cooktop light are mounted on the front side of the counter instead of at the back?	6	3 (50%)	1 (16.7%)	2 (33.3%)
The clothes rods in your closets are mounted lower than usual?	6	3 (50%)	1 (16.7%)	2 (33.3%)
There is clear space under the sink?	6	3 (50%)	0	3 (50%)
The light switches are mounted lower than usual?	6	3 (50%)	0	3 (50%)
There is an intercom system to buzz guests in?	22	10 (45.5%)	4 (18.2%)	6 (27.3%)
There are front loading washers and dryers?	22	8 (36.4%)	6 (27.3%)	8 (36.4%)
The bedroom and bathroom doors have lever style handles instead of round knobs?	6	2 (33.3%)	2 (33.3%)	2 (33.3%)
The oven is raised?	6	2 (33.3%)	1 (16.7%)	3 (50%)
The electrical outlets are mounted higher off the ground than usual?	6	2 (33.3%)	0	4 (66.7%)
Your closets have bi-fold doors instead of regular doors?	6	2 (33.3%)	0	4 (66.7%)
There are benches around three sides of the table and that there is open space on the fourth side?	22	5 (22.7%)	7 (31.8%)	8 (36.4%)
The thermostat is mounted lower than usual?	6	1 (16.7%)	1 (16.7%)	4 (66.7%)
There is a social room in the building?	22	1 (4.5%)	5 (22.7%)	16 (72.7%)
There is a community kitchen?	22	1 (4.5%)	5 (22.7%)	16 (72.7%)

<p style="text-align: center;">Additional UD Features</p> <p><i>We're trying to find out what people are looking for in an apartment. Please tell me on a scale from one to seven how important it would be for you to have the following features in terms of convenience, comfort or safety. A one means that the feature would not be important to you at all, a four means that the feature would be somewhat important, and a seven means that the feature would be very important.</i></p>	Base	Average	Standard Dev.
TOTAL			
Peepholes in the front door for security	22	6.41	1.436
Windows that can be opened and closed with little physical effort	22	6.05	1.527
Lights in all of the closets	21	5.67	2.033
A full-length mirror mounted on the wall	21	5.43	2.315
A thermostat with a large digital display	22	5.32	1.887
Doors with a keyless entry system such as a card swipe or remote control	22	5.00	2.545
Light switches with dimmers	22	5.18	1.967
Phone and cable jacks in multiple places around the home	22	5.14	2.295
Non-slip flooring in the bathroom	21	5.14	2.435
Extra lighting in the bathroom	22	5.14	2.210
A fire alarm with flashing strobe lights and a warning siren	22	4.95	2.236
Under-cabinet lighting to light the countertops	21	4.90	2.300
Cutting boards that pull out from underneath the counter top for extra workspace	22	4.82	2.383
A doorbell	22	4.77	2.468
Counters with rounded edges	22	4.73	2.434
Grab bars near the tub, shower, and toilet	16	4.69	2.774
Lights that come on automatically when you open the closet door	22	4.68	2.234
A roll in shower instead of a tub and shower combination	22	4.68	2.212
An adjustable height counter for folding laundry	22	4.64	2.441

Additional UD Features	Base	Average	Standard Dev.
A bench or platform at the head of the tub to use to enter the tub or to place personal care items on	16	4.63	2.419
Adjustable height shelves in the closets	16	4.38	2.604
Adjustable height shelves in the bathroom	22	4.36	2.441
A sink with the drain, garbage disposal, and piping further towards the back to allow more clear space underneath	21	4.29	2.630
A vanity with counters at varying heights	22	4.23	2.544
Toilets that are 18 inches tall instead of the standard 14 inches	22	4.14	2.455
Counter tops or work surfaces at varied heights	22	4.09	2.671
A side-by-side refrigerator-freezer	16	4.06	2.645
Lever-style door handles	16	4.06	2.489
An intercom or emergency signal system	22	4.05	2.591
Adjustable height clothes rods in the closets	16	4.00	2.633
Upper kitchen cabinets that are mounted lower than usual	22	4.00	2.410
A refrigerator with shelves that pull out	22	4.00	2.370
Wheeled carts for moving laundry in the laundry room	22	3.95	2.734
Open space or knee space under the sink, cooktops, and counters	22	3.95	2.554
Garbage cans or recycling bins on pull out drawers in lower cabinets	22	3.91	2.428
Single lever faucets	21	3.86	2.393
Backlit light switches	22	3.86	2.122
An oven, microwave, or other appliances with doors that open to the side instead of folding down	22	3.82	2.519
Shelves that pull out from lower cabinets	22	3.82	2.500
An oven, cooktop, or other appliances that have their controls mounted on the front or side instead of at the back	16	3.75	2.646
An adjustable height sink in the laundry room	22	3.73	2.622
Closet doors with C-shaped handles instead of knobs	21	3.67	2.415

Additional UD Features	Base	Average	Standard Dev.
Rocker-style light switches	22	3.64	2.258
Light switches for the closet lights both inside and outside of the closets	22	3.50	2.385
A rolling cart to transport food on	22	3.36	2.361
Multiple peepholes at varying heights	22	3.27	2.658
A dishwasher, oven, and other appliances that are raised to discourage bending	16	3.00	2.530
Controls for the range hood fan and garbage disposal mounted on the front of the counter instead of at the back	16	3.00	2.366
Lazy Susan shelves in corner cabinets	22	2.95	2.360
Electrical outlets and other jacks that are mounted higher off the ground than usual	16	2.87	2.125
Electrical outlets in the closets	22	2.77	2.202
A thermostat and light switches mounted lower than usual	16	2.62	2.187

VI. Future Directions and Research

When we embarked on the Washington Court research project our goals were extremely ambitious. The initial team asked whether and how living in a universal design apartment could change and benefit people's lives. We had hoped to evaluate the effectiveness of certain features and amenities. The research team posited that UD resulted in increased social, educational and employment opportunities, decreased reliance on home health care, personal assistance services, and public benefits, and allowed for greater independence. The grand scheme was to interview tenants every six months for several years to record and evaluate their income, benefits, third-party assistance, social activities and functional abilities. In retrospect, these objectives were impractical and far beyond the resources, budget and expertise of our clinical law program, which operates as a law firm.

That said, we believe that our research supplements the existing data surrounding residential universal design and might be used to spark discussions and contribute to policy debates about multigenerational and affordable housing. From our perspective, the project is a success if stakeholders use the report, conduct-your-own survey and universal design checklist to evaluate living environments and share their experiences with others.

All limitations aside, the report furnishes a snapshot of the people who lived in the apartments in October 2008 and chronicles their impressions, experiences and opinions. Additional research will be required to develop a more detailed portrait of people at Washington Court and people who live elsewhere. We are fairly certain that other organizations are conducting more rigorous formal research studies; we look forward to receiving their findings and insights. This section summarizes ongoing and potential Clinical Law Program projects and gives suggestions for how to better examine universal design in different contexts.

Expand the Washington Court Housing Survey. A more elaborate survey is needed to supplement and interpret our original findings with a larger sample size. The study population could include all residents of subsidized housing units in Dubuque. Or, researchers could study tenants in larger apartment complexes in other cities. We hope to replicate and expand upon our findings and confirm that there are two distinct groups of residents, those who value UD and those who are apathetic toward it. Refining our methodology will hopefully result in statistically significant and generalizable findings, particularly about people who have functional limitations and those who do not.

Conduct a Matched Pair Analysis of a Universal Design and Standard Built Single Family Home. The REALTOR® Homes For Our Future is a homeownership project in Iowa City to build and showcase an affordable, single family home that incorporates universal design, green and sustainable building practices. <http://www.icaar.org/node/483>. The home is based on a standard model the local developer routinely constructs. We modified the original design, floor plan, equipment, heating systems and other features to incorporate universal design (and green features, such as geothermal heating). The buyers have agreed to be interviewed several times after the sale to help us evaluate the usability, desirability and cost-effectiveness of the modifications. We also plan to study the specific and opportunity costs of universal design. The project may decide to test using the conduct-your-own survey and checklist we developed.

Evaluate Universal Design in Historic Preservation. Step by Step Inc., and the City of Dubuque asked us to help redesign, rehabilitate and transform an 1890s brownstone into seven universal design apartments and a community kitchen for use by persons with disabilities. We secured permission from HUD to grant priorities to income eligible applicants with qualifying disabilities.

These applicants must use mobility aids and need the UD and accessibility features in the building, such as the elevator, power assist doors, top loading microwave, motion-sensor lighting, roll-in or low threshold showers, etc. Tenants are expected to move into the building in May 2009. City officials are interested in surveying the tenants on an ongoing basis to measure the benefits and cost effectiveness of UD and energy-saving devices in the building. They are considering using the survey and checklist we developed or enlisting our help in conducting the study. The city will review its building codes and contracts and determine if it will require minimum UD features and standards in all publicly funded housing projects.

Universal Design in the Workplace and Commercial Facilities. Do businesses and employees benefit from universal design? And, if so, what should the design and construction standards be? These questions are unresolved and, for the most part, have largely been ignored by the private sector to date. Gronen Restoration requested that we review the drawings and floor plans for the adaptive reuse of the historic Roshek Building in downtown Dubuque, which was formerly a department store. Future tenant IBM intends to open a technology service delivery center that is LEED-certified and includes UD. Another opportunity arose recently in Dubuque; the city is revitalizing its Warehouse District for mixed residential and commercial use and is interested in incorporating UD as it expands. In a related vein, The Global Universal Design Commission is researching and developing voluntary consensus standards for buildings, products and services to guide corporations and government entities in the creation of barrier-free commercial facilities.

Developing a Model to Record, Track and Measure Project Costs. Documenting the costs associated with universal design has been problematic for just about everyone involved in housing. On-site change orders, purchase orders and receipts, bid books and itemized accounts are often misplaced or archived quickly as one project ends and another begins. To complicate matters, the price of hardware, cabinets, appliances and fixtures fluctuate, vendors go out of business or rename their products and many label items as ADA-approved even though no one certifies or approves products based on complying with ADA Accessibility Guidelines. Hard, accurate and reliable cost information is hard to find. A focal point of future research should be the creation of a system to record, track, and measure project costs.

A retrospective examination of Iowa City's B Street UD Home. In 2001, the city teamed up with a local homebuilder, the legal clinic and community organizations to design and build a single-family home with basic and state of art features, including a motorized, adjustable kitchen sink. One of the owners has lived there since he bought the house in 2003; he has opened the home to the public and clinic students every year. With his permission and adequate resources, we will inspect and photograph the house to find out how well the appliances, cabinets, hardware and fixtures have held up to daily use. We have videos and pictures of the home to conduct a "before and after" assessment to supplement personal interviews. Information, floor plans and pictures are at <http://www.icgov.org/default/?id=1169> and <http://www.uiowa.edu/infotech/News17-1.pdf>.

The Executive Summary and the Complete Report, “The Washington Court Housing Survey: A Study of Accessibility and Universal Design in Affordable Housing”, were developed and distributed by Student Legal Interns under the supervision of Professor Len Sandler at the Clinical Law Program, University of Iowa College of Law, Iowa City, Iowa 52242.

The Student Legal Interns who participated in the design, construction and evaluation of the building, created and administered the survey and authored this report are: Sara Stephenson, Andrew Ward, Syd Gernstein, Aaron Aizenberg, Rachel Antonuccio, Kirsten Arnold, Todd Bagby, Kevin Barstow, Ross Binder, Scott Burrill, Michelle Croft, Jackie Famber, Jason Fernandez, Nick Kehrwald, Andrew Knutson, Jayne Lady, Abby Lemek, Karla Martinez, Adam McCabe, David Milender, Jennifer Moyer, Trent Norman, Reuben Ortega, Benton Page, Bill Peffer, Roselyn Tyson, Matt Van Maasdam, and John Walker.

For more information, or to request copies of the report in print, digital, .pdf or other format, please contact the University of Iowa Clinical Law Program by calling 319.335.9023 or sending an email to leonard-sandler@uiowa.edu.