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Crossing the Threshold:

Problems and Prospects for Accessible Housing Design

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Acknowledgements

Introduction

The movement of people with disabilities out of state institutions into residential housing has been called "one of the great migrations in recent history."[1] Since the end of World War II, disabled people in the United States have fought to live in mainstream society. Beginning with injured World War II veterans, their effort gained momentum and visibility with the deinstitutionalization movement of the 1960s and 1970s. Decades of activism led to the Architectural Barriers Act of 1968, followed by the passage of Section 504 of the Rehabilitation Act in 1977, and culminating in the Americans with Disabilities Act (ADA) in 1990. In 1999, the Supreme Court's decision in *Olmstead v. L.C.*, requires states to find the most integrated way to house and serve the needs of people with disabilities.[2] These laws reverse more than a century of official segregation, and expand social inclusion in the United States.

Older people want to remain in their own homes, too.[3] Like the disabled, "the degree to which they can participate in community life will be determined, in part, by how well their physical environment accommodates them and the level of services provided."[4] The post-World War II generation is aging, yet, the current state of housing and infrastructure does not provide for the anticipated changes in their health and mobility. Without adjustments, many elderly people will be uprooted to facilities like nursing homes that can serve their needs. This looming demographic surge portends a national "forced migration"[5] in the reverse direction—towards institutionalization.

The ADA created for the first time a comprehensive mandate to make buildings, infrastructure, and transit accessible to people with disabilities. It is the only civil rights legislation that includes detailed technical diagrams (the ADA Access Guidelines) as a mechanism for distributing justice to a long underrepresented group. It attests to the fact that for people with disabilities, living in society depends on reconfiguring its physical contours. That idea is undergirded by a political concept that disability is not a fixed, individual problem but the product of the relationship between body and environment. It says that discriminatory practices embedded in the design of environments contribute to the disablement of certain people.[6] In other words, people

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[1] Mandelker, Daniel R. "Housing Quotas for People with Disabilities: Legislating Exclusion." *The Urban Lawyer*, Fall 2011, 915.

[2] Supreme Court of the United States. Olmstead v. L.C. et al, 138 F.3d 893, (98-536) In *U.S. 527 581* 1999.

[3] Farber, Nicholas, Douglas Shinkle, Jana Lynott, Wendy Fox-Grage, Rodney and Harrell. "Aging in Place: A State Survey of Livability Policies and Practices." AARP Public Policy Institute and National Conference of State Legislatures, 2011,, viii.

[4] "The State of Housing in America in the 21st Century: A Disability Perspective." Washington DC: The National Council on Disability, 2010. Foreword.

[5] Rocky Marcoux, Commissioner for the Department of City Development, City of Milwaukee, WI, quoted in Maisel, Jordana L., Eleanor Smith, Edward and Steinfeld. "Increasing Home Access: Designing for Visitability." AARP Public Policy Institute, 2008, 5.

[6] Siebers. Tobin. Disability Theory. *Corporealities.* Ann Arbor: University of Michigan Press, 2008.

are disabled *by* their environment.[7] For example, buildings without ramps or elevators bar people with mobility limitations from full participation in society. Conversely, buildings with ramps and Braille, for example, enable wheelchair users and the Blind to enter and use them—opening the door (literally, in some cases) to social institutions.

Yet there has been a backlash against the ADA.[8] Some business owners, developers, and others feel that the law represents government overreach, interferes with private property rights, and caters to the interests of a small minority. Those responses reflect the belief that the disabled are not part of "us," and that disability is not a fundamental part of living. However, a recent national study reports that in 2007, 35 million households in the US had one or more people with some kind of disability, representing 32 percent of all American households.[9] As people age they are much more likely to develop physical and mental disabilities[10] – and by 2040, the population of people 65 and over will top 20 percent.[11] Whether from birth, accident, disease, war, or old age, the number of disabled is growing. Indeed, modern medicine's capacity to save and sustain lives amplifies this trend. Thus, while many of us may not yet have direct contact with people defined as disabled, increasingly, we will come to know or become one of "them." Families and friends of the over 32,000 Iraq veterans who returned with injuries like brain trauma and limb amputations already understand this.[12]

As the baby boom crests into old age, concerns long considered the province of the disabled are expanding. Some of us are helping our parents and grandparents adjust to their changing physical and cognitive conditions. Elderly and disabled people share a number of social and material requirements. Both groups need accommodations in housing, better transit options, and more efficient delivery of services. The unique economic and political clout of the post-war generation has spurred reconsideration of a topic previously thought of as marginal. While not identical, analyzing the needs of the elderly and disabled side by side allows us to better understand the commonalities among them, and perhaps recasts them as a regular part of the social landscape. This realignment could help to dissolve the entrenched spatial and symbolic boundaries between mainstream society and so-called special populations, and sheds new light on our understanding of collective and individual responsibilities. In planning circles, at

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[7] Disability rights scholars and activists argue that building standards, like other norms, are cultural and historical artifacts, not natural ones. By this they mean that how we define which bodies (people) are accommodated emerges from what are essentially political decisions.

[8] See, among many sources, a discussion of the role of media mischaracterizations of the ADA in Fleischer, Doris Zames, and Frieda Zames. *The Disability Rights Movement: From Charity to Confrontation*. Philadelphia: Temple University Press, 2001., 106.

[9] "The State of Housing in America in the 21st Century: A Disability Perspective," 27.

[10] "The State of Housing in America: A Disability Perspective," 27.

[11] Ghazaleh, Abu, Greenhouse, Homsy, and Warner. "Multi-Generational Planning: Using Smart Growth and Universal Design to Link the Needs of Children and the Aging Population." In *Family-Friendly Communities Briefing Papers 2*: American Planning Association, 2011, 2.

[12] Wood, David. "Iraq War Casualties Still Ripple across the Home Front." In, *The Huffington Post* (2013). Published electronically March 17, 2013. http://www.huffingtonpost.com/2013/03/17/iraq-war-casualties_n_2884952.html. Accessed June 10, 2013.

least, this demographic reconfiguration is transforming thinking about accessible housing and communities.

Accessible housing: demand and supply

The need for accessible housing far exceeds supply, in part because the current legal framework is inadequate to keep up with the demographic factors that increase the demand for housing that maximizes mobility and independence. The ADA applies mainly to transportation and public accommodations. The Fair Housing Act and Section 504 of the 1973 Rehabilitation Act regulate accessible housing; both prohibit discrimination in housing on the basis of disability (among other things), which, in principle, increases access to existing accessible stocks. In addition, the laws mandate a quota of accessible housing for any development that receives federal financial assistance. Section 504 requires that only five percent of homes in buildings with four or more units be accessible for mobility impairments and two percent for hearing and visual disabilities. In a recent report, the National Council on Disability stated that even if all developments complied with this minimum (which is doubtful because of lax enforcement), merely 68,000 accessible public housing units would be created nationwide.[13] In fact, some policy priorities may impede the production of accessible housing. For example, an analysis of the state of accessible housing in the Boston area observed that state and local agencies don't provide the same incentives to developers for accessible as for "green" housing design. [14]

Roughly half of people with disabilities rent or own their own homes.[15] The other half lives under someone else's roof, typically family, or in some kind of aggregate housing, including group homes. Households with a disabled resident are much more likely to be low or very low income than those without. In addition, below the age of 65, disabled people are more likely than non-disabled people to be renters (37 percent versus 31 percent). Public rental housing has been the main legal focus of accessibility efforts, reflecting, in part, the socioeconomic status of most people with disabilities. However, there are much higher levels of homeownership among disabled people between the ages of 65 and 85, meaning "that among owners in this age bracket, nearly 94% have a disability." [16] It also suggests that they acquired their home before their disability.[17]

Regional factors shape the problems of accessible housing as well, producing different local conditions. Older urban areas present particular challenges. There, the primary problem is that most old buildings have stairs and other features that make maneuvering with mobility aids difficult or impossible. It costs more to renovate existing

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[13] "The State of Housing in America in the 21st Century: A Disability Perspective," 10.

[14] Parker, Olin. G. *Increasing Affordable, Accessible Housing in the Greater Boston Area*. Unpublished Policy Analysis Exercise: Harvard Kennedy School, 2011, 30.

[15] Jay, Klein, and Nelson Debra. "Homeownership for People with Disabilities: The State of the States in 1999." *Journal of Vocational Rehabilitation* 15, no. 2/3 (2000): 67.

[16] "The State of Housing in America in the 21st Century: A Disability Perspective," 27-28.

[17] Ibid.

housing than to build in accessible features from the start. Alterations such as widening doorways, ramping entrances, adding elevators or lifts are expensive or technically infeasible retrofits. Disabled residents often can't afford to make the changes, even when grants or tax incentives are available. They depend on landlords to make or approve alterations. But because of expense, technical complexity, and other worries, many landlords are reluctant to make changes unless legally obligated.

Private single-family residences, the largest sector of the housing market, are not covered by disabled access regulations.[18] Yet that is where most people with disabilities, including older adults, live.[19] The vast majority of these homes are inaccessible to wheelchair users and those with visual, hearing, and other ambulatory disabilities. The legal omission of private single-family homes from the ADA attests to the scope of the law's antecedents, the historic legal protection afforded to private property in the United States, and the legacy of vocational rehabilitation in government services, which focused on restoring disabled people's productivity and thus often overlooked domestic spaces. Apart from renting and owning, the ramifications are that people with limited mobility can't even visit friends and relatives who live in private single-family homes. Many disabled people consider the inaccessibility of single-family homes to be one of the biggest obstacles to taking part in a normal life because it makes it nearly impossible to have social contact outside of the small portion of residential buildings that are covered by the laws.[20]

Architecture and the perception of accessible design

People's image of accessible design is largely shaped by bad examples. What usually come to mind are ramps clumsily tacked onto building entrances, large toilet stalls with metal grab bars, and the ubiquitous blue signs (the International Symbol of Accessibility) posted at building entrances, parking spaces, and car windshields (Figure 1). Spaces look "technologized" by the addition of factory fabricated components, controls, sensors, and safety features—finished in metal or "beige melamine."[21] For many non-disabled people, most close-up encounters with this architecture occurs if they have to stay in the token accessible hotel suite, where metal and plastic fold down benches and roll-in showers impart an institutional feeling (Figure 2). The consensus is that accessible architecture looks unattractive and different from "regular" architecture.

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[18] Smith, Stanley K., Stefan Rayer, Eleanor Smith, Zhenglian Wang, and Yi Zeng. "Population Aging, Disability and Housing Accessibility: Implications for Sub-National Areas in the United States." *Housing Studies* 27, no. 2 (2012/03/01 2012): 253. Hope VI and federally funded single-family detached housing are exceptions, but they represent a minute fraction of single-family housing development. http://www.fairhousingfirst.org/faq/singlefamilyhomes.html, accessed March 20, 2013.
[19] Farber, Shinkle, Lynott, Fox-Grage, and Harrell, 46.
[20] Hotchkiss, Ralph, founder of Whirlwind Wheelchair International, interview by author, Berkeley, California, June 13, 2011.
[21] Ju Gosling, quoted in Pullin, Graham. *Design Meets Disability*. Cambridge, Mass.: MIT Press, 2009. 121.

Figure 1 Left: "handicapped" parking space with access aisle. Right: retrofitted entrance ramp. [Source: http://www.portawalk.com/]

Design for disability has historically been treated differently from other design. The purview of engineers and occupational therapists, the design of objects for the disabled rarely incorporates the exploration, celebration, and play that design culture fosters. Engineers and occupational therapists treat their task largely as a technical functional problem, rather than focusing on aesthetics and creating a positive experience for users.[22] Moreover, apart from end-of-the line adjustments, it's unusual to include disabled people who could infuse new aesthetic and other ideas into the process. The closed world of design and provisioning of disability aids takes place not in stores but in clinics and rehabilitation offices, immune to the forces of the consumer market. With few exceptions, there is little investment in aesthetic qualities, which might appear wasteful and frivolous given the seriousness of purpose and limited resources of its makers and users. While this oversimplifies the problem, it nevertheless sums up the aesthetic state of affairs. Bad design not only reflects the low status

Figure 2 Left: wheelchair accessible bathroom in Hilton Hotel Santa Cruz Scotts Valley. Right: Sleep Inn Phoenix Airport Hotels. [Source: http://www3.hilton.com/en/hotels/california/hilton-santa-cruz-scotts-valley-SJCSVHF/accommodations/accessible.html, http://www.sleepinn.com/media/eBrochure/ebrochure/AZ/AZ805/AZ805B8.JPG]

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[22] Pullin.

accorded to the disabled, it undermines how we view disability. Conversely, "more confident and accomplished design could support a more positive image of disability."[23]

The last statement was made about personal assistive devices, but it also applies to the "assistive devices" appended to the urban landscape. This opinion isn't limited to consumers. Many developers, including for-profit residential builders, believe that accessible design is less desirable to renters and buyers. Remodeling for accessibility, they fear, will diminish property value.[24] The sentiment pervades development and architectural culture, which has played a role in perpetuating it. While US architects have accepted disabled access codes as a routine part of doing business, few have embraced them as a source of creative inspiration. Mainstream architectural education rarely teaches accessible design, and the professional literature frames disabled access mainly in technical or legal terms. Many architects and their clients continue to view accessible accommodation as acquiescence to special interests at the cost of creativity and economic efficiency.

Building codes dictate how architects and builders address the needs of the disabled.[25] What frustrates many architects and others in the building industry is that accessible design regulations continue to be revised. This reflects an evolution in best practices, but the "moving target" is also a consequence of compromises between business and disability communities. Accessible design standards—and changes in the standards—are as much the result of politics as of physical criteria.[26]

In addition, the code is not an exact manifestation of the technical needs of the disabled but a "hybrid, hodge-podge" of various, often conflicting, agendas.[27] An example of this is the standard accessible toilet. The current seat height is 18 inches—quite low for tall people and those who have trouble bending their legs, while too high for children and short people. It facilitates a person transferring from wheelchair to toilet, which realizes the needs of one kind of body.

Standards are indispensable for disseminating and implementing accessibility in design. Indeed, architects rely on standards to design all sorts of things. All standards have values embedded in them.[28] Architectural standards were until recently based on a very specific image of the human body. Iconic images like the Vitruvian Man and the

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[23] Pullin, 38.

[24] Lemmon, Wayne. "Reality Check from the Homebuilder's Sales Floor." *PlannersWeb.com*. Published electronically April 19, 2007. http://plannersweb.com/2007/04/reality-check-from-the-homebuilderssales floor/. Accessed April 26, 2013.

[25] This includes the ADA guidelines at the federal level and state and municipality, that have incorporated ADA, and sometimes stricter, regulations, which architects have to conform with.

[26] Breslin, Mary Lou, interview by author, Berkeley, California, November 15, 2011.

[27] Breslin, Mary Lou. Mikiten, Erick, interview by author, Berkeley, California, June 14, 2011. Breslin is the co-founder of DREDF (Disability Rights Education and Defense Fund), a leading national disability rights and policy center, who served on the committee that developed the ADAAG. Mikiten is an architect who uses a wheelchair and who teaches continuing education classes on accessibility standards for architects.

[28] Hosey, Lance. "Hidden Lines: Gender, Race, and the Body in 'Graphic Standards'." *Journal of architectural education* 55, no. 2 (2001): 101-12. See also: Lampland, Martha, and Susan Leigh Star. *Standards and Their Stories: How Quantifying, Classifying, and Formalizing Practices Shape Everyday Life*. Ithaca: Cornell University Press, 2009.

Modulor reveal the idealized male figure that grounded architectural geometry in fundamental proportions found in nature (Figure 3).
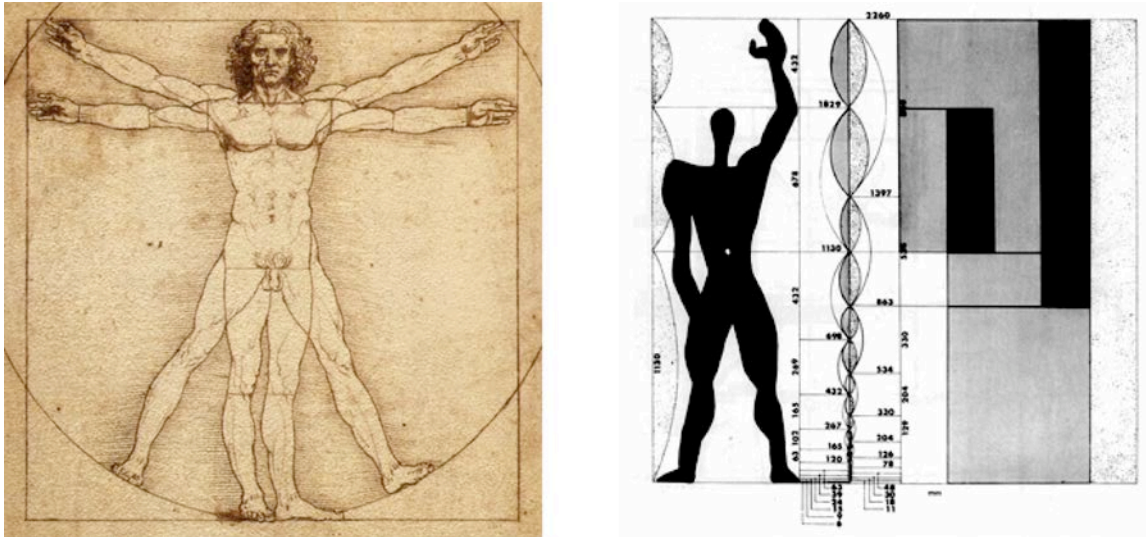

Figure 3 Left: Vitruvian Man by Leonardo da Vinci, ca. 1490. Right: Le Modulor by the modernist architect Le Corbusier, ca. 1943. [Source: http://gregcarver.com/blog/wp-content/uploads/2011/02/eur-vitruvian_man.jpg, http://www.cartage.org.lb/en/themes/biographies/MainBiographies/L/leCorbusier]

Architectural Graphic Standards disseminated the standard body of American practice. Regularly reissued since 1932, this essential compendium contains thousands of templates and diagrams that provide design shortcuts seemingly for every task.[29] Scientific management studies from the early 20th century were a source for many of its guidelines related to the human body, reflecting a concern with labor optimization (Figure 4).[30] Until recently, there were no female bodies in *Graphic Standards*, much less bodies with impairments.[31]

Architects' reliance on templates and standards leads to a fairly superficial consideration of actual bodies and capabilities. Unwittingly, they develop designs around this "normal"—in fact, idealized—human figure. Access laws introduced a "disabled standard" to design (Figure 5). The new code recognizes basically three types of disabilities: hearing, visual, and mobility impairments, with the last attracting by far the most attention. Design measures that address sensory impairments, like audible emergency alarms, contrast markings, and Braille signs take up little space and are relatively inexpensive, even as retrofits. Wheelchair access impacts design much more. The iconic blue accessibility sign demonstrates that wheelchair users have become "the

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[29] Pressman, Andy, American Institute of Architects and Maran Smith, Architect. *Architectural Graphic Standards*. 11th ed. Hoboken, N.J.: John Wiley & Sons, 2007. Like the Physician's Desk Reference, this dense volume is standard in architectural office libraries. It contains tens of thousands of drawings, including many addressing human dimensions and ergonomics.

[30] Hosey, note 17, 109.

[31] Ibid, 105.

prototypic representation of disability in western societies,"[32] even though they make up only a fraction of the disabled population (Figure 6). In fact, the conflation of wheelchair and person in the symbols and diagrams farther abstracts designer from the specificities of real bodies.
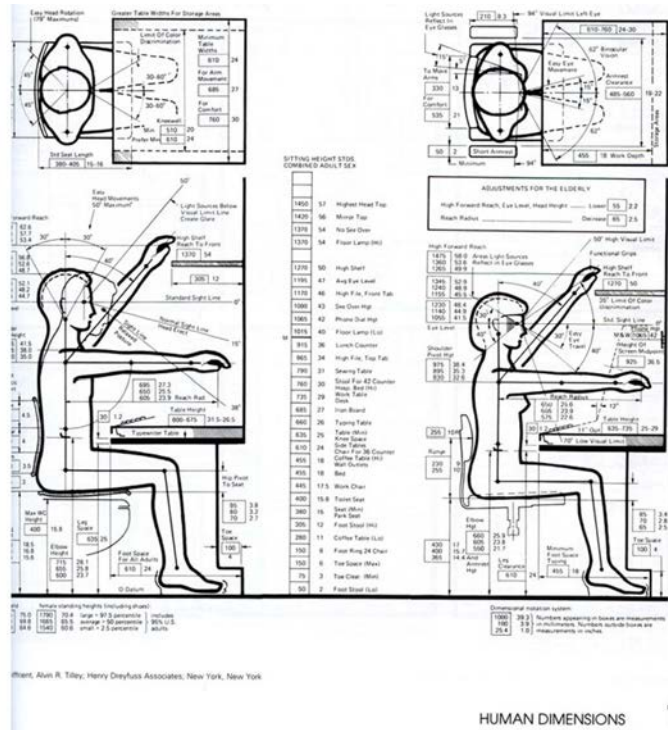
Figure 4 "Human Dimensions." [Source: *Architectural Graphic Standards*]
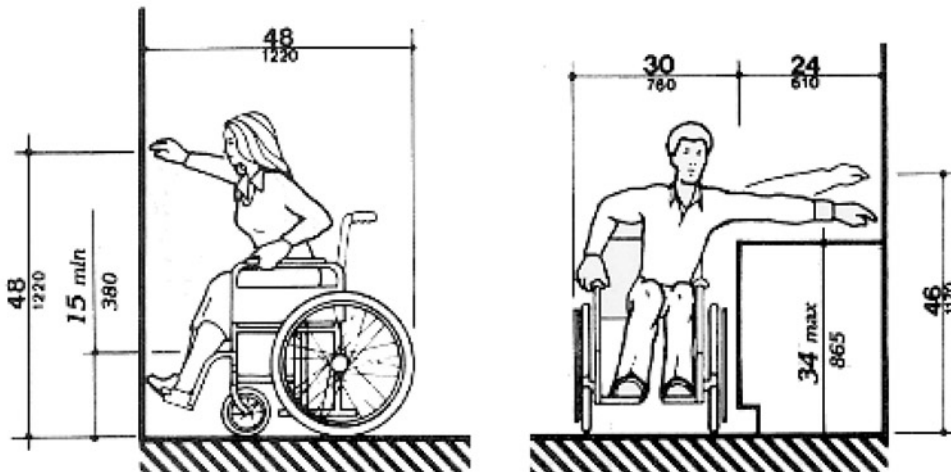
Figure 5 Left: ADA figure 5a High Forward Reach Limit. Right: ADA figure 6c Maximum Side Reach Over Obstruction. [Source: http://www.access-board.gov/adaag/html/adaag.htm]

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[32] Ben-Moshe, Liat, and Justin J. W. Powell. "Sign of Our Times? Revis(it)ing the International Symbol of Access." Disability & Society 22, no. 5 (2007): 495. As this article shows, debates about how this symbol was developed and whether it is the best presentation of disabled people continue.

The ADA redresses longstanding discrimination. Yet some of its design regulations affirm the idea of an "able" and a "disabled" user, often prescribing separate solutions for each. Implementation and enforcement mechanisms further distinguish able from disabled. The code compels building and business owners to verify compliance, by, for example, prominently identifying accessible amenities with signs. To qualify for some accommodations like "handicap" parking spaces, people have to prove their eligibility. Disability becomes something that is marked on the owner's vehicle or his body through the display of placards or badges. Who deserves to use these amenities is also informally policed. For example, a person must appear disabled to use special parking spaces or seats on buses, or face social opprobrium.[33] In that sense, by using accessible features, "people with impairments are simultaneously accommodated and disabled (being labeled, separated or segregated)."[34]

Figure 6 International Symbol of Accessibility

Architecture's recalcitrant attitude towards access law permeates professional culture. Because the ADA guidelines (and state and local models) provide detailed diagrams for many functions, architects perceive them as hindering the exercise of their professional expertise. The code seems like a "design police," with plan checkers and building inspectors its inflexible, inconsistent, and narrowly-focused agents. While accessibility regulations *are* prescriptive and require navigation, architects rarely complain about the equally strict regulations that govern fire and life safety design. In San Francisco, a city known for its liberal positions on social justice issues, architects who design publicly funded housing, whose access provisions are overseen by the Mayor's Office on Disability, routinely complain about complying with its mandates.[35] Moreover, architects' fears of the legal repercussions if they fail to comply is underpinned by how the law is enforced and stoked by media stories.[36]

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[33] Morgendorff, Karen. "Doing Frogs and Elephants: Or How Atypical Moving Bodies Affect and Are Affected by Predominantly Able-Bodies." *Medische Antropologie* 22, no. 2 (2010): 330.

[34] Ben-Moshe and Powell, 494.

[35] From author's professional experience and from discussion with Daniel Adams, Director of Program Development, San Francisco Mayor's Office of Housing, Oakland, California, April 2, 2013.

[36] See Fleischer, Zames and Zames, 106-107. John Stossel, for example, has made a career of going

The historical development of the profession in the United States partly explains this stance. Architecture has a comparatively weak claim on building knowledge. Since contractors, engineers, and interior designers also possess some of the same skills and authority, architects can't assert their sole authority in building design. The ADA has spawned services and products that further encroach on architectural expertise. Code consultants, plan reviewers, and engineers have established certifiable and cost-effective access solutions. Manufacturer-guaranteed ADA-compliant products like prefabricated ramps and shower stalls offer to solve many basic access problems without architects. In response, the profession continues a tradition of eschewing tasks that overlap with other trades or professions in order to sustain its purity.[37] It treats design for disability as both "too specialized an issue"[38] and beneath the artistic aspirations of architecture. Thus, accessibility has come to be viewed as impervious to architectural intervention.

A landmark legal case affirmed this passive professional position. In 1996, the Paralyzed Veterans of America sued the large American firm Ellerbe Beckett Architects and Engineers over the design of wheelchair seating in the MCI sports arena in Washington D.C.[39] In an unsolicited amicus brief, the American Institute of Architects (AIA, the national professional organization) supported Ellerbe Becket's argument that it was not at fault because it merely carried out its paying client's wishes. The AIA's official position, summarized in a legal study, was, "we are merely innocent subservient agents of all-powerful employers."[40] While the architects lost this suit, their argument affirmed the profession's disregard for accessibility, even though, ironically, it also demonstrated the risks of doing so.

Universal Design

Universal design takes a different approach from accessible building codes that rely on the ADA. Its proponents argue that the code is not a great tool for developing

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after the ADA as the prime case of government overreach and foolishness. A 2010 online article on FoxNews.com is the latest installment, in which he argues the inefficient and unfair consequences of the law: "The bathroom sinks must be a specified height. So must the doorknobs and mirrors. You must have rails. And if these things aren't right -- say, if your mirror is just one inch too high -- you could be sued for thousands of dollars. Stossel, John. "No Good Deed Goes Unpunished?": FoxNews.com, 2010. http://www.foxnews.com/opinion/2010/09/02/john-stossel-americans-disabilities-act-ada-irs-rules-labor department-exxon/, accessed June 28, 2013.

[37] Brain, David. "Practical Knowledge and Occupational Control: The Professionalization of Architecture in the United States." *Sociological Forum* 6, no. 2: 263.

[38] Pullin, 241.

[39] The accessibility of stadium seating was the subject of a series of landmark lawsuits, thoroughly investigated in several articles. See Mazumdar, Sanjoy, and Geis, "Accessible Buildings, Architects, and the ADA Law: The MCI Center Sports Arena Case." *Journal of architectural & planning research* 19, no. 3 (2002), *and* Mazumdar, Sanjoy, and Geis, "Architects, the Law, and Accessibility: Architects' Approaches to the ADA in Arenas." *Journal of architectural & planning research* 20, no. 3 (2003): 199-220.

[40] Mazumdar, Sanjoy and Geis, "Architects, the Law, and Accessibility: Architects' Approaches to the ADA in Arenas." 205.

the best designs for accommodating disability. The main principle of universal design is that buildings and objects should be equally functional for people with and without disabilities.

Universal design was originally developed in the 1970s by a group of American industrial designers to create products that are easy to use for people with a broad range of physical and cognitive capabilities.[41] In the 1980s, the architect Ron Mace extended the approach into architecture. The conceptual departure of universal design is that disabled users should not be singled out but rather be part of a broader reconsideration of good design practice—"design for all." A classic example of this is the curb-ramp (Figure 7), originally developed for wheelchairs, but which benefits parents with strollers, travelers with luggage, delivery people, and so forth.

Unlike the building code's prescriptions, universal design provides performance criteria, giving designers the leeway to define and work out various challenges. Instead of templates with minimum and maximum dimensions, universal design's seven principles connect functional, aesthetic, and ethical design outcomes. For example, Principle One includes the injunction to "avoid segregating or stigmatizing any users,"[42] the way, for example, a ramp at the side entrance singles out people with mobility impairments. The guidelines ask designers to consider what physical and cognitive abilities and functions, not which users, should be built into the design of things. Ideally, they engender a participatory process in which proposed solutions can be imagined, modeled, and even staged. By focusing on how function and aesthetics convey meaning more broadly, universal design deemphasizes disability.

Figure 7 Left: woman pushing stroller up curb cut. Right: wheelchair user at curb cut. [Source:
http://wwbpa.org/2009/09/,
http://www.fhwa.dot.gov/publications/research/safety/pedbike/05085/chapt8.cfm]

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[41] Williamson. Bess. "Getting a Grip: Disability and American Industrial Design of the Late Twentieth Century." *Winterthur Portfolio* Winter, forthcoming (2012).
[42] Preiser, Wolfgang F. E., and Elaine Ostroff. *Universal Design Handbook*. New York: McGraw-Hill, 2001,10.1. Principle 1 Equitable Use: 1b.

Universal design has gained currency in a number of areas, including in industrial design (e.g. OXO Good Grips), computer interfaces, education, and planning policy. International governing bodies like the World Health Organization and the United Nations have adopted it for plans of action, [43] and its concepts shape the agenda of Human-Centered Design, an information resource for global non-governmental organizations funded by the Bill and Melinda Gates Foundation.[44] In addition, universal design is the philosophical basis for educational programs like the Center for Universal Design at North Carolina State University and the Center for Inclusive Design and Environmental Access (IDEA) at the University of Buffalo. While this would seem to signal wider interest in issues of access and disability, the fact is that universal design has yet to make an impact on mainstream architectural practice. The Freedom by Design platform of the American Institute of Architects Students (AIAS) website, which is currently co-sponsoring two international design competitions that focus on universal design, may portend future change (Figure 8).[45]

Figure 8 Freedom by Design Website, American Institute of Architects Students. [Source: https://www.aias.org/website/article.asp?id=72]

Nevertheless, a few veteran architects have taken up universal design's creative and social challenge. A highly praised example of a building based on universal design principles is the Ed Roberts Campus (ERC) in Berkeley, California, designed by the San Francisco firm Leddy Maytum Stacy Architects' (LMSA). The ERC is an 85,000 square-foot

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[43] Imrie, Rob. "Universalism, Universal Design and Equitable Access to the Built Environment." *Disability & Rehabilitation* 34, no. 10.

[44] See IDEO's Human Centered Design, http://www.ideo.com/work/human-centered-design-toolkit/, accessed April 10, 2013.

[45] See http://aarp.aias.org/program/, accessed April 24, 2013.

memorial to the disability rights movement leader Ed Roberts that houses seven disability service and advocacy organizations. The design incorporates features like accessible parking, direct vertical access to rail (Bay Area Rapid Transit), zoned curb drop-off, automatic doors, varying floor finishes, simple loop circulation, and a water feature at one end of a central atrium for visual and acoustic cues. However, the epitome of universal design is a central full-story helical ramp. Wide enough to allow two wheelchairs abreast, it encircles a large public space under a sky-lit rotunda (Figure 12). The curved procession incorporates an art gallery along its perimeter, delineated by a sinewy red ribbon of guardrail (Figure 9). Glorifying the inclusive circulation feature shifts the idea of who is disabled by taking "the 'dis' out of disability," as project advocates put it.[46] Proclaiming "great architecture a *fundamental human right* (original emphasis),"[47] principal Bill Leddy affirms the place of access within architecture's mandate to achieve moral ends through aesthetic means.
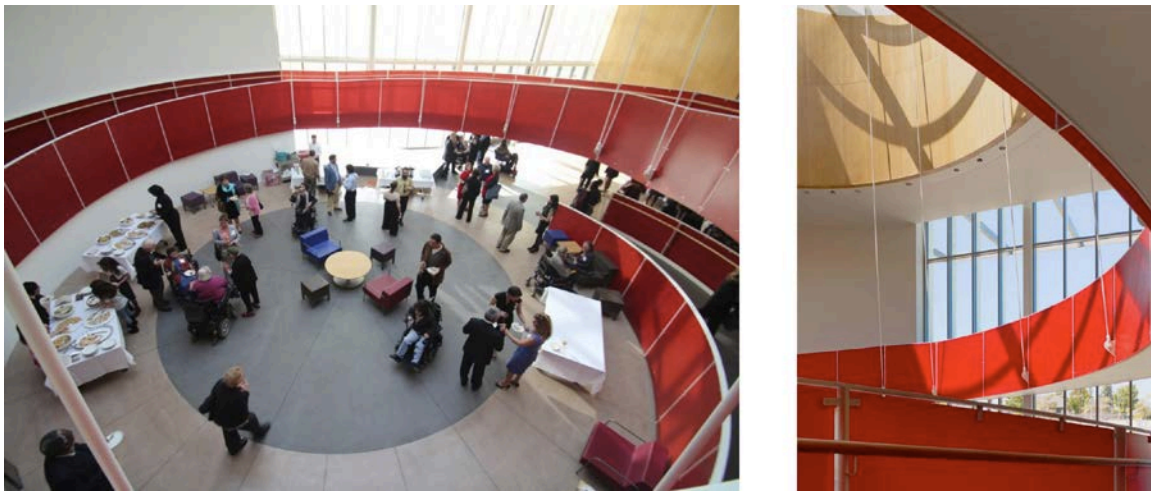

Figure 9 Left: view of ramp and common space from above. Right: View of ramp looking up at skylight. [Source: http://www.edrobertscampus.org/event-rentals/the-erc-ramp-lobby/, Maytum Leddy Stacy Architects]

The handful of buildings in North America designed according to universal design principles include Blusson Spinal Cord Center in Vancouver, British Columbia, which opened in 2008, and Access Living headquarters in Chicago, completed in 2007. To date, substantial government subsidies make possible the few universally designed public projects in the United States. Yet a key goal of universal design is the commodification of accessibility features to develop accessible environments. Universal design offers designers, developers, and manufacturers an open-ended system that allows them to make creative and cost judgments. Such flexibility may make industry more willing to voluntarily adopt and experiment with it, thereby introducing disability as a creative

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[46] Jones, Carolyn. "Unparalleled Accessibility at New Center for Disabled." *San Francisco Chronicle*, April 16, 2007.

[47] Leddy, William, interview by author, San Francisco, California, January 5, 2011.

impetus for design and development culture. The business approach of universal design argues that inclusion will result from consumer demand.[48] Critics worry that focus on market-oriented and technical solutions fails to recognize that discrimination is a social problem not limited to design. While poorly designed objects and spaces provide significant obstacles, prejudice, both official and informal, is a greater hindrance. Indeed, disability rights experts consider physical accommodation the "easy" discrimination issue to address, with employment posing a much bigger challenge.[49]

New Policy Initiatives

　　Partly because of its unregulated status, private single-family housing is an area where universal design is gaining some momentum. Spurred by demographic trends that make "aging in place" and "flexible" living options increasingly necessary, governments and businesses are beginning to investigate how they can use universal design. Both practical and ethical forces propel policy experiments. In 2012, congressional leaders introduced the Inclusive Home Design Act, which promoted a stripped-down version of universal design called Visitability, a policy long advocated by the non-profit organization Concrete Change. The bill required all newly-constructed, federally-assisted single-family houses and town houses to include at least one level with units that include three basic features: a no-step entry, 32" clear doors on the ground floor, and a half bath on the ground floor. That would accommodate, at minimum, short-term occupancy for those with mobility difficulties. While Congress failed to enact this relatively modest legislation, it shows that some lawmakers are responding to a growing need to disperse accessible housing throughout their communities.

　　Lack of federal and state regulation of private single-family residential development creates the space for local authorities to develop a variety of mechanisms—mostly voluntary—to increase the quantity of accessible housing in their jurisdictions.[50] Such initiatives are led by municipal (or quasi-public) housing and development agencies in consultation with local home seekers and builders and accessibility experts. They take a number of different approaches: tax credits for housing that meets specific design guidelines, a minimum of accessibility features homebuilders can select off a menu, and penalties for opting out. If good results data is kept, these locales can act as laboratories for new approaches to making the housing stock more accommodating of differing needs.[51] In Davis, California, the proposed Universal Access Housing Ordinance, which will go up for a vote in late 2013, is more ambitious. A closer look reveals some of the implications of a mandatory policy approach.

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[48] Imrie, 876.

[49] Fleischer, Zames and Zames, 94.

[50] For more information on the different programs see Maisel, Smith, and Steinfeld, Appendix A, and Kochera, Andrew. "Accessibility and Visitability Features in Single-Family Homes: A Review of State and Local Activities." AARP Public Policy Institute. 2002.

[51] Maisel, Smith, and Steinfeld, 21.

Davis, California

> *Instead of asking why Davis should provide universally designed housing, we should ask why not? Relying on specific identified purchasers of a new home to decide whether or not, or to what extent, the home is accessible is not a reasonable approach to this issue. A new home tomorrow will change hands many times, and there is no way to anticipate the needs of the home's later occupants. Including accessible features in new homes on a case by case basis makes no more sense than leaving decisions about whether a home includes double pained* [sic] *windows or an air conditioning system to the first buyer of the home. New homes should be designed to meet the generalized, generic needs of future owners.*[52]

This public comment from the City of Davis Workshop on Accessible Housing, held in 2010, captured the rhetorical tone for the process that led to the 2013 draft ordinance that requires virtually all new single-family home construction in the city to be accessible.[53] The idea initially came from the Social Services Commission, an advisory group on accessible and affordable housing to the Davis City Council. Loopholes in state and federal accessibility regulations meant the city was not keeping up with current and projected demands. "Aging in Place and Universal Design," a 2009 California Department of Housing and Community Development report, which noted that older people want to stay in their own homes as they age and develop impairments, fueled their actions. Davis does not have a particularly high proportion of older or disabled adults, but city officials recognized that the confluence of an aging population and aging-in-place trends could transform any municipality into a de facto retirement community.

City representatives, local homebuilders, and members of the community worked out the proposed law, first as a policy, giving builders and planners nearly five years to better understand what implementation meant. After much debate, the term "universally accessible" was chosen to convey the intent without evoking the legal language of the ADA and the building code. In fact, some deviations from the ADA, such as not requiring a 1:12 slope at an entry path on lots with uneven grade, make it more practical to implement. An array of features was tested during the initial phase, resulting in somewhat narrower final requirements that reflect developer concerns about cost and feasibility. If passed as drafted, the main elements that new homes will

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[52] Poulos, Deborah Nichols. Attachment 3: Public and Developer Written Communications, 04F-12. City of Davis Workshop on Accessible Housing. October 18, 2010.

[53] Carriage units, secondary or accessory units, and developments of 15 or fewer in the Davis Core Area are exempted from the proposed regulation. "Universally accessible" refers to a set of accessible features as defined in the Davis Ordinance. The term is deliberately not a legal term to avoid confusion with building codes and the ADA. "Resolution Directing Completion of a Universal Access Housing Ordinance and Corresponding General Plan Amendments to Replace the Existing Accessible Housing Policy for Single Family Housing Units." *Resolution Number 12-169*, Davis City Council, 2012. 4.

have to incorporate are: a low threshold entry (up to a half inch), a no-step path to the entry, no-step interior path of travel, accessible half bath on the ground floor, accessible common area (that can double as a bedroom), and a plan layout that includes power sources to accommodate a future lift or elevator. While the new mandates won't meet everyone's needs, it considerably exceeds the provisions of the Inclusive Home Design Act, in part by making it easier to make the second floor wheelchair accessible.

The measure differs from most accessibility programs that have cropped up across the country because it is mandatory and more comprehensive. Municipalities don't always exert the authority to enact mandatory building regulations that exceed state and federal ones. Legal challenges to a municipality's authority to impose laws that interfere with private property owners' rights, upheld by the Supreme Court, constrain what municipalities can do in the interest of public good[54] – though a Pima County, Arizona mandatory visitability ordinance withstood a legal challenge in 2002.[55] Davis, a city of 65,000 residents, covering 10 square miles, has smart growth development policies, which require city council approval for the majority of proposed developments. There is little vacant land left and most housing development entails changes in zoning, for example, from commercial to residential in the downtown or agricultural to residential in the agricultural buffer zone. Consequently, the city has quite a lot of leverage with developers.[56] The city has been careful to work together with local builders to develop a clear public interest justification that enlists community support.

The rhetoric expands the moral community of disabled access by reframing what is usually considered a niche issue in terms of the public interest. Private single-family housing has historically been exempt from many of the regulations that govern public buildings because of the great value placed on private ownership. However, a conventional understanding of private property overlooks a number of significant facts. Government interest in private single-family housing is evident in the many programs that have created the housing market. Since the end of World War II, the government has had a strong hand in shaping private single-family development, notably through government backed mortgage assistance and the Interstate Highway System, which utterly transformed the America's social and physical landscape in a few decades. Public investments in services, like emergency workers, roads, and schools, make the private housing market possible. In addition, the government pays for many of the services that people in these homes receive, in the form of Medicare and Medicaid. Thus, private single-family housing is both a responsibility and resource of the public sphere.

The recognition of the private-public symbiosis of housing is reflected in planning and building regulations like standards for construction safety and energy consumption. Changes in regulations and codes reflect the evolution of both technology and social values. In Davis, citizens and policymakers linked housing to questions about the health of the community: What happens when housing can't support its population? Is it good

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[54] Dolan v. City of Tigard, 512 U.S. 374 (1994).

[55] Salvesen, David. " Housing Visitability: A Necessary Trend." *Urban Land* 67, no. 5 (2008): 150-52.

[56] Foster, Danielle, Superintendent of Housing and Social Services Department, Davis, California, telephone interview by author, June 19, 2013.

to live segregated by generation? What should the community expect from its housing stock? Increasingly, diversity of age and ability is considered central to creating healthy communities, measured in terms of physical health, quality of life and social engagement.[57] Planners and policymakers are thinking of housing as an important element to be mobilized in improving the health and well-being of society. Recognizing single-family homes, the largest sector of the housing market, as part of the effort to accommodate the spectrum of the human condition—young, old, disabled—is a growing focus of that effort. A 2011 AARP report on state livability policies and practices said it plainly: "Because most people with disabilities—including older adults—live in private housing, efforts may be warranted to design houses and communities that are accessible to all."[58]

Helping people to stay in their own homes or find homes that allow them to live independently in the community has been shown to have many public and individual benefits. People who live at home are generally more productive, happier, and maintain contact with others than those living in institutions, like nursing homes.[59] Yet mobility and other limitations often require some kind of home modification, and people who stay in homes that don't accommodate their needs are more likely to be injured, often leading to greater disability. That in turn leads to greater isolation and dependency.[60] The financial costs of inaccessible housing ripple through society. Household accidents impose big medical costs, much of which are paid for by state and federal funds. Inadequate housing is also a main reason for moving to assisted living or care facilities, a cost that is also largely borne by the government.[61] It is well documented that integrated living solutions are much less expensive, in many respects, than more institutional settings.[62]

"Recent research estimates that, conservatively, 25% of new houses built today at some point will have a resident with severe long-term mobility impairments."[63] The holistic approach of the Davis ordinance represents a paradigm shift that responds to this reality. By proposing that the housing landscape should be made accessible to everyone (even if current occupants don't need it) brings building access policy in line with other building regulations, such as structural and fire and life safety laws. The latter anticipate quite rare catastrophic events like fires and earthquakes. Basically, the Davis law makes a similar argument for the occurrence of a disability. Homes must be designed to accommodate the eventuality of disability among buyers, renters, and guests during the course of their life span. Not doing so constitutes a performance failure on par with structural failure. Given the statistics, it's just the latest facet of contingency planning.

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[57] Ghazaleh, Greenhouse, Homsy, and Warner.

[58] Farber, Shinkle, Lynott, Fox-Grage, and Harrell, 46.

[59] Smith, Rayer, Smith, Wang, and Zeng, 253.

[60] Maisel, Smith, and Steinfeld, 4.

[61] Ibid., 5.

[62] Jay, Klein. "The History and Development of a National Homeownership Initiative." *Journal of Vocational Rehabilitation* 15, no. 2/3 (2000): 60.

[63] Maisel, Smith, and Steinfeld, 20.

Building codes are historical artifacts that reflect current social values. With growing public awareness of disability, it is becoming less acceptable to think that the disabled should be sequestered or limited in their living choices. State and federal codes set small quotas for the number of accessible units to be built in a development based on demographics. In a sense, that approach perpetuates the attitude that disability is not something likely to happen to us at some point in our lives. The conceptual shift from quotas to universal requirement represents a change in attitude about the disabled: from "them" to potentially "us." While the Davis ordinance might look like a radical change from past approaches, it can also be seen as a continuation of leveraging housing to safeguard public health, safety, and well-being. In that sense, it's part of the evolution of the building code, reflecting the ethics we want to embed in our buildings today.

The response from the Davis building community has generally been positive. Feedback included requests to make the requirements more flexible, to test out the assumptions about what house forms were most suitable for the disabled and seniors, and concerns that the regulations would increase construction cost.[64] An interesting discovery was a discrepancy between the access regulations and density requirements of the city's smart growth policy. Some of the smaller lots can't fit a ground floor that includes a garage and an accessible bedroom and bathroom. Planners agree that the city will need to make minor modifications to its lot size guidelines in order to allow property owners to conform to the proposed ordinance.

Considering physical accessibility in tandem with density is gaining currency in planning circles nationwide. Increasingly, the rubric of sustainable design connects ecological and social goals. A 2011 paper by the American Planning Association, called, "Multigenerational Planning: Using Smart Growth and Universal Design to Link the Needs of Children and the Aging Population"[65] explains how economic, cultural, and population changes are making our households and neighborhoods more age diverse than ever before. The authors argue that smart growth strategies best accommodate this situation because compact, pedestrian-friendly, transit-oriented, mixed-use developments encourage (independent) mobility for children and the elderly. Being able to walk by themselves to stores, parks, offices, and schools frees them from dependence on cars and parents and caregivers. Creating walkable environments also addresses other public health issues like obesity.

Many studies identify universal design as a key strategy to making housing, transit, and infrastructure usable for the whole population. The "Design for Adaptability" program of Leadership in Energy and Environmental Design (LEED) also links ecological concerns with adaptable design, but frames it differently. Under the LEED Homes Pilot Credits, projects can get points for "design for future use and modifications," based on the fact that, "waste from demolition and remodeling accounts for a significant portion of what goes into landfill. Designing for future use and

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[64] "Summary of Comments (to date) from the Development Community." Attachment 3 - Public and Developer Written Communications, City of Davis Workshop on Accessible Housing, 04F-14-16.
[65] Ghazaleh, Greenhouse, Homsy, and Warner,

modifications can reduce the intrusiveness of renovations, significantly reducing future waste."[66] Programs like this reverse a history of targeting accessibility at geographical islands like senior communities, nursing homes, and disabled housing. Instead, they recognize the value of accessible housing to the entire community and the costs of leaving it as it is.

New Market Initiatives

The interplay between policy and the market is complex and dynamic. Policies both reflect public opinion and change it. The ADA has forced reluctant entities to act through new building standards, which have generated new products and services and improved the accessibility of the built environment. The private and for-profit housing sectors have been slow to include access or universal design, arguing that there is as yet little consumer desire for accessible homes. They consider the market and consumer demand as a more legitimate source of change and view the ADA's blanket approach to design as government overreach.[67] Thus, apart from specialized markets like retirement housing, homebuilders have not led the charge on this front.

A few exceptions may preview what's on the horizon for mass-market single-family accessible housing. Demonstration projects like the architect Michael Graves' Wounded Warrior Home Project, built at Fort Belvoir, and a Universal Design Living Lab house, under construction in Columbus, Ohio, provide educational, design and technical resources to the public. In northern California, Eskaton, a non-profit senior housing and service provider has developed an alternate model. Five years ago they began creating a certification program that they hope will not only give developers an edge in the marketplace, but change consumer expectations and market standards. As is often the case with disability-related matters, the genesis of the project was the personal experience of a member of the company's board. After surgery put her in a wheelchair, his mother could no longer stay in the home she loved. Her refusal to live in an assisted-living facility drew his attention to an untapped consumer demand: community-based accessible housing. He convinced the company that this was an opportunity to promote a new housing product—part social mission, part market expansion.

After extensive research, it developed the Eskaton Certified Housing program, a comprehensive matrix of over 100 accessibility features, based largely on universal design principles.[68] Builders who adopt the system pay a per-model-plan review cost

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[66] See LEEDUser, http://www.leeduser.com/credit/Pilot-Credits/PC34, accessed April 24, 2013. The Pilot Credits is a system of Leadership in Energy and Environmental Design, U.S. Green Building Council, that allows users to rate new criteria for energy efficient and sustainable building.

[67] See current similar arguments on abortion and same sex marriage. The Editorial Board, "Justice Ginsburg's Misdirection." *New York Times online* The Opinion Pages, (2013). Published electronically April 2, 2013. http://www.nytimes.com/2013/04/03/opinion/justice-ginsburgs-misdirection-ahead-of-the gay-marriage-rulings.html?_r=1&., accessed April 9, 2013.

[68] There are a handful of similar programs. Lifeflex of Denver Colorado certifies homebuilders and remodelers guaranteeing clients, renters, and buyers that they're getting buildings and renovations that meet universal design standards.

and a licensing charge for each unit built. In exchange they have access to Eskaton's research, expertise, and established market networks. Similar to the way LEED certification works for sustainable building, Eskaton has created a third-party verification system for accessible housing, rebranding it as a more sensible and higher quality alternative to mainstream products.

But the homebuilders they worked with saw a problem: Eskaton's association with senior and assisted living didn't project the right image for the mainstream market. Production homebuilders "sell a lifestyle" and it was hard to convince prospective homebuyers to spend extra on design options they perceived as being for elderly or disabled people.[69] Program director Erin Clay Scherer said that the problem was that consumers distinguish between "lifestyle" and "needs-driven" options.[70] The former includes things like granite countertop upgrades, and increasingly, sustainable design features like LED lighting. It doesn't include a zero-step entry. New homebuyers don't yet grasp the concept of universal design (whether called inclusive, livable, flexible, or multi-generational) partly because it is a new product with which they're not familiar. Moreover, it anticipates needs they can't or don't want to imagine. The benefits of most accessible features only become apparent in the future. Accessible design options don't have the same positive visual impact as stainless steel appliances. Nor do they reap "green" features' immediate energy savings, which show up in reduced utility bills.

The early developer feedback on the Certified Housing program echoes the claim that there is no market demand for disabled or elderly-friendly design features in private single-family housing—at least when marketed as such. A "from-the-trenches" editorial, posted on a planning website a few years ago in response to an article by Jordana Maisel that advocated for accessible single-family housing, encapsulates the standard response. The author claimed that, "The problem is that folks who do not need these accommodations simply do not want them in their new home. As a moderate volume homebuilder, our experience with homes that we have been required to build with accessibility improvements has been that these homes are left as the last to sell in the project, and are ultimately sold at discount to purchasers who do not want the enhancements."[71] This statement perpetuates the common belief that prospects for consumer demand for accessible private single-family housing are dim. While such anecdotal evidence may reflect the situation superficially, it acts as if market demand is a natural and spontaneous phenomenon. Yet consumer demand emerges from the complex dynamics of marketing, need, policy, and many other factors. Indeed, housing is a more publicly-structured market than those of other commodities.[72] Government-backed mortgage assistance, loan rates, and so forth organize supply and demand, and these, among other things, condition consumer patterns in housing. While the status

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[69] Clay Scherer, Erin, Director Livable Design, telephone interview by author, April 12, 2013.

[70] Ibid.

[71] Lemmon, Wayne.

[72] Cohen, Lizabeth. *A Consumers' Republic: The Politics of Mass Consumption in Postwar America*. New York: Knopf, 2003. Chapter 7, "Residence: Inequality in Mass Suburbia," 194-256, provides an in-depth discussion of the myriad local, state, and federal regulations and policies that shaped the post-war housing market, including the court battles that addressed the most contentious issues.

quo seems stubbornly resistant to change, US housing consumption patterns have historically been shaped to fulfill public ambitions.[73]

Eskaton believes its product anticipates a new market. Using builder feedback, it retooled the program to make it easier for developers to use and sell to prospective buyers. (Interestingly, the 2008 downturn in the housing market created space for them to develop the idea.[74]) Calling it "housing designed with the future in mind," the company has repackaged it to resonate with as-yet unrealized need.[75] Now called Livable Design, the restructured program combines an array of choices designed "to flex with your changing needs over time." Copying the rhetoric of universal design, Livable Design redefines accommodation as benefiting everyone—disabled and nondisabled. It stresses improving home function for children, busy parents, the elderly, and so on. For example, marketing material explains how a zero-step entry makes moving furniture and strollers easier. Similarly, the website shows how low-mounted microwaves, handheld showerheads, and pan-sensor stove technology improve function and safety for everyone.

Now, accessible features are presented alongside child-friendly, pet-friendly, "green," hi-tech, and easy maintenance design packages. This strategy arose from the company's experience that design features that are not targeted at physical limitations, such as ceiling fans and outdoor speakers, solar tubes, radiant heat floor, etc. speak more to consumer "lifestyle" desires. Along those lines, Livable Design commends features like a ground floor bedroom and an open plan for their general utility (Figure 10). The website's virtual tour informs us that having a bedroom downstairs serves today's households because of the greater privacy that the floor separation offers, while "an open floor plan also allows greater circulation space and the ability for families to share time together even as they go about their daily activities in different areas of the home"[76] (Figure 11). Kitchens and dens are scenes of multigenerational domesticity (Figure 12). Accommodating the eventuality of a disability is thereby obscured through a more universal and "sexier" architectural presentation. While these tactics show that accessibility by itself is still not a very appealing sales angle, it does represent disability and aging as normal aspects of an American lifespan.

Responding to the legacy of poorly designed and retrofitted access solutions, Livable Design, like universal design, stresses the importance of aesthetics. It seamlessly, even invisibly, designs for physical and cognitive conditions that are usually overlooked. This camouflage approach means that access features often have an insignificant or hard to discern aesthetic impact. The advantage is that it counters the negative image of design for disability. Paradoxically, though, their invisibility means that when choosing from a list of options, homebuyers may not even *see* the accessible design or its value, so that the negative afterimage of accessibility may obscure the decision making process.

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[73] Cohen, 5.
[74] Clay Scherer.
[75] Livable Design Website, http://www.livabledesign.com/, accessed April 17, 2013.
[76] Ibid.

Figure 10 View of Livable Design model home open plan. [Source: http://www.livabledesign.com/livable-design-tour/]

No certified houses have been built yet, apart from a model home in Roseville, California. But there are steps in that direction. As a prelude to its launch, Eskaton developed preliminary cost estimates with a local homebuilder that indicates that for a 1,900 square foot home, the program increases the cost to the developer roughly $2,000.[77] While estimates for building accessible housing vary and are notoriously unreliable, given builders' usual resistance,[78] the amount is currently viewed as significant in a market that is sensitive to cost increases, and for a product whose saleability is still unknown.[79] In any event, executives at Eskaton and others believe that costs will decrease as new standards and techniques are developed, and that, in any event, demand will soon overshadow price.

How the single-family home market will eventually integrate these design ideas is unclear. Unlike public accommodations, private single-family housing makes experimentation and innovation possible, exactly what Graham Pullin says has been

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[77] Clay Scherer.
[78] Salvesen, 150-52.
[79] Ibid.

missing in the medical- and technical-dominated disability design sphere.[80] However, the situation also presents a tension between standardized and flexible models.

Circulation Space

The kitchen is the heart of the home. It's where people gather to socialize and enjoy good food. Extra circulation space makes the kitchen easier for the whole family to enjoy

Tilt Mirror

This stylish tilt mirror allows you to see more than what a fixed mirror can provide; helpful for kids or when seated at the vanity.

Figure 11 Views of kitchen and bathroom design features as described on the Livable Design Website. [Source: http://www.livabledesign.com/livable-design-tour/]

Approaches like universal design's performance criteria allow designers to rethink problems that have up until now been narrowly defined. At the same time, however, for economic and practical reasons, production developers typically depend on architectural templates and formulas. Indeed, developers rely on prescriptions, tried and true solutions, often preferring lists of clear options to choose from.[81] Though there is some flexibility with Livable Design—for example, Eskaton has a review process that will approve a builder's non-standard plan if it meets universal design intent—the system depends on the dissemination of prescriptions. Its "menu" consists of standards, largely because that makes it easier to certify compliance, which is the basis of its seal of approval. Thus, while Livable Design (and similar programs) may produce more accessible housing stock, it won't necessarily lead to more creative or innovate design approaches.

A related question is how universal design affects architectural aesthetics or style. Comparing Eskaton's model home with a house built in New Zealand, designed according to a similar system called Lifemark, sheds light on this issue (Figure 13). Lifemark is a non-profit government-supported program that provides builders and architects design advice and standards to create "Lifetime Design,"[82] a certified product. The Livable Design model house reflects American popular tastes, which favor hybrid historicism: colonnaded entry porch, stone-base pillars, and crown molding, combined

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[80] Pullin.

[81] See "Summary of Comments (to date) from the Development Community."

[82] Lifemark, "Designed for Life and Living" Website, http://www.lifemark.co.nz/lifetime-design.aspx, accessed April 17, 2013.

with an open plan. On the other hand, the LifeMark-certified Blundell House is sleekly modern, comprised of seamless metal-sided surfaces that meet floor to ceiling glazing, with a monolithic ramped wrap-around wood porch. Many factors, including differences in cultural and individual taste, and the scale of production—the American mass housing model versus client-commissioned home—explain such diverse interpretations. Indeed, it shows the flexibility of universal design. If anything, universal design may be more compatible with the floating casework, uninterrupted planes, and open layouts of modern design (Figure 14).

Figure 12 Left: Blundell House, designed by architect Davor Milcucic, Studio MWA. Right: façade of model Eskaton Livable Design house in Roseville, California. [http://www.lifemark.co.nz/the-lifemark/case-studies/case-study-blundell.aspx, http://www.livabledesign.com/livable-design-tour/]

Figure 13 Left: The kitchen, Blundell Residence. Right: the owner, seated on the wrap-around ramp of his home. [Source: http://www.studiomwa.co.nz/images/sylvan%20way%2001/sylvan_way15.html, http://www.lifemark.co.nz/the-lifemark/case-studies/case-study-blundell.aspx]

There is a noticeable difference in the scope of requirements between commercial and public systems. Government programs are relatively narrow, in some cases comprising only the three visitability features. For example, some proponents of the policy route lament what they view as the modest reach of the final guidelines of the Davis ordinance, believing that to transform both industry and public taste requires stronger policy.[83] Builder resistance often limits what cities can do. In crafting regulations, governments make sure that they do so in a way that gets business on board, following a general drift away from bold policy, as "market solutions to big social problems have triumphed" in recent decades.[84] Voluntary market initiatives are free to be more comprehensive, perhaps succeeding by infusing design for disability with glamour, nostalgia, or sex appeal. But market values shouldn't determine all dimensions of society. The high cost of housing and renovation, combined with the socioeconomic disadvantaged position of many disabled and elderly people, argues for other means to improve the accessibility of housing. Indeed, lack of physical access contributes to the weak economic influence of these groups, reproducing existing inequities. Public policy, which sometimes responds to grassroots efforts like Concrete Change's advocacy for the Inclusive Home Design Act, may be a more effective route for change.

The big limitation of both policy and market approaches is that they address only new housing permits; very few initiatives currently deal with existing housing stock.[85] In established urban areas "the most intractable obstacle to creating affordable and accessible housing units" is that buildings were built before accessibility laws and landlords can't afford to make changes to them.[86] Current and proposed programs will have uneven impacts at both neighborhood and regional scales. Accessible design initiatives will have biggest effects in regions of the country that have land for new development. That leaves older and central districts with an inaccessible housing stock. And yet, because of their density, proximity to services, transit, and pedestrian access, these areas are better suited for "multi-generational planning" initiatives.[87] In this case, greater subsidies and incentives could be offered to enable smaller landlords to remodel, while new certification programs could be developed for adaptive reuse projects, modeled on those for ground-up construction.

Conclusion

People with disabilities, including older adults, want to live in diverse communities, not segregated settings. A lot of evidence shows that integrating the

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[83] Clay Scherer.

[84] Lemann, Nicholas. "When the Earth Moved: What Happened to the Environmental Movement?" *The New Yorker*, April 15, 2013, 73-76.

[85] LifeFlex in Colorado certifies contractors in remodeling accessible/universal designed housing. LifeFlex Website, http://www.life-flexhome.com/builders.html, accessed May 2, 2013. An Kang in Singapore provides design consultancy services that include home renovations. An Kang Living Website, http://ankangliving.com/About-Us.php, accessed May 2, 2013.

[86] Parker, 15.

[87] Ghazaleh, Greenhouse, Homsy, and Warner.

population by age and ability has tremendous benefits for individuals and society. Intergenerational and inclusive neighborhoods improve the health and happiness of individuals by helping them to participate in a social, economic, and civic life. The community is richer for being multigenerational and diverse and by including their knowledge and contributions. There are also proven economic advantages because it decreases the need for medical and institutional care, which cost significantly more than community-based services.[88]

As the post-war generation "ages in place," their changing needs of housing and infrastructure will be felt at local and national levels. Nascent planning strategies that foster multigenerational and "livable" communities dovetail with policy objectives to conserve resources, decrease automobile dependence, promote dense development, and support public health. The physical (and economic) accessibility of housing is a key part of these initiatives. Accessible housing allows people of all ages to stay in their homes and communities regardless of their mobility needs. However, laws that mandate accessible design in housing don't meet current needs, much less projected demand. The ADA, Fair Housing Act, and Section 504, combined, cover only a small fraction of the housing produced—mostly in the form of publicly-funded multi-family housing. Yet, in 2007, "65 per cent of all households and 69 per cent of householders aged 65 or older were living in single-family detached units."[89]

Recognition of this regulatory gap has sparked a number of public and market-based initiatives to develop design standards for accessible housing. However, there are a number of obstacles to widespread acceptance of accessible design. The current political climate makes consumer demand central to arguments for progress on both regulatory and market fronts. Yet, consumer resistance is partly due to the negative perception of accessible design, which is a circular problem: the lack of interest in both design and consumer cultures prevents its adoption and transformation through the dynamics of image creation, fashion, and style—key ingredients to creating demand. While there have been some creative, high-design forays that challenge existing approaches, they represent a miniscule and largely unknown segment of the market. Moreover, there are few broad private or public campaigns that educate consumers about the potential benefits of accessible design. Thus, there is limited awareness of the aesthetic, practical or moral arguments for it.

For this to change, a number of things will have to happen. Without endorsing exclusively market mechanisms, design for disability should adopt some of the practices and values of design culture, including attracting designers who are not necessarily specialists in inclusive design.[90] In parallel, design professions, particularly architects, need to shift their way of thinking about disabled access away from a code-driven mentality to stimulate creativity and new ideas. The American Institute of Architects

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[88] Kitchener, Martin, Terence Ng, Nancy Miller, and Charlene Harrington. "Institutional and Community-Based Long-Term Care: A Comparative Estimate of Public Costs." *Journal Of Health & Social Policy* 22, no. 2 (2006): 43.

[89] US Census Bureau, 2008, cited in Smith, Rayer, Smith, Wang, and Zeng, 259.

[90] Pullin, 63.

Student "Freedom by Design" program, which challenges young architects to develop design for easier mobility, looks promising.

On the housing front, public and private actors are developing a variety of initiatives to create awareness and improve the accessibility of single-family housing, the biggest sector of the market. At the public level, these range from (mostly) volunteer and incentive based programs to mandatory regulations, such as the one in Davis, California. A comprehensive comparative study of how these measures are working could provide valuable information for the continued development of such initiatives. Maybe the groundswell of demand for accessible housing will come from housing industry innovations—whether through certified housing products or producers, or yet-untried solutions. Systems like Livable Design and LifeFlex in the United States, and LifeMark in New Zealand, may influence what consumers will demand of their homes. However, until the economics of accessible design normalizes, the price sensitivity of the market makes it unlikely that voluntary measures alone can reshape the housing landscape.

One concern is a potential conflict between different imperatives. Historically, the more comprehensive the requirements become, the more prescriptive they get, limiting design choice and exploration, but also enabling standard procedures for implementation by diverse actors in different contexts. On the other hand, open-ended systems encourage experimentation, which seems more likely to change attitudes about accessibility within design cultures, but present challenges for adequate and consistent application. The complexities of interpreting the guidelines and evaluating design solutions with a more flexible approach demand highly trained officials and architects who have a new and more critical understanding of design and accessibility. This kind of endeavor can only succeed with sweeping re-education that departs from the idea of access as compliance. Likely such an approach would present many challenges—not least of which is understandable opposition from the disability rights community, which may be loath to relinquish hard-won remedies in favor of uncertain outcomes.

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