ABSTRACT

Title of Document:	AN ARCHITECTURE OF SOCIAL RESPONSIBILITY
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This thesis asserts that the built environment, as a primary stage for social and economic activity, responds to and contributes to social and economic conditions. Architects must design buildings that are appropriate not only with respect to culture, climate, and available resources, but with respect to societal needs and inequities that are often ignored. The current state of the profession of architecture must be reevaluated in light of its passivity towards questions of social justice. The architect must assume greater responsibility as an agent for the public interest because the architect has a discernable, measureable impact on society whether he or she wants/intends to.

My goal is to advance a basic design-making framework to demonstrate how architects and designers can address social injustices in the built environment through a design project which would result in benefiting the social and environmental opportunities of diverse stakeholders.

AN ARCHITECTURE OF SOCIAL RESPONSIBILITY

By

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Thesis submitted to the Faculty of the Graduate School of the
University of Maryland, College Park, in partial fulfillment
of the requirements for the degree of
Master of Architecture
2014

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Preface

The architecture community is increasingly recognizing that good design is not only a matter of responding to culture, climate, and available resources, but also of addressing societal needs and deficiencies that are often ignored. Most major American cities have examples of neighborhoods where poorly conceived and maintained urban housing and urban development schemes have contributed to communities characterized by crime, economic isolation, and segregation. While some lessons have been learned from previous mistakes, the architecture profession is still in need of an effective framework that helps building professionals to design projects with an awareness of their social implications and potential benefits.

Many lessons can be learned from the experience of the architectural community in responding to the challenge of climate change. In recent years, the architecture community has recognized the effects of the built environment on carbon emissions and climate change, and has put in tremendous effort and resources not only to measuring our impact on the environment, but also to promoting strategies to minimize our carbon footprint. We can measure how much carbon dioxide output buildings are responsible for in the United States. As of 2008, the U.S. Department of Energy reported that buildings were responsible for about 40 percent of carbon dioxide emissions in the United States, with residential buildings accounting for 54 percent of building-related emissions.[1] Leadership in Energy and Environmental Design (LEED) certification identifies industry-accepted strategies and practices for environmentally sustainable architecture, and rewards those architects, planners, and builders who promote these practices.

[1] "Buildings and Emissions: Making the Connection." *Center for Climate and Energy Solutions.* n.p. n.d. Web. 14 May 2014.

The architecture community, however, does not yet have a similarly nuanced understanding of the impacts of the built environment on the economic and social health of cities and communities. The social and economic deterioration of communities and cities contributes to increased unemployment, crime, and poor social outcomes. There is already some great scholarship that has been conducted by academics, organizations, and architects such as Hannah Rosenthal, Architecture for Humanity, and Michael Pytok to name a few. They have raised some very important questions that require continued attention. For example, to what extent is the design of the built environment responsible for income inequality in a particular neighborhood, city, or region? To what extent should a building try to be socially responsible and what does social responsibility mean? How do we measure the degree to which a building does or does not satisfy the public interest? Who decides what is in the public's interest? How can we encourage designers and others who affect the built environment to make buildings work in the broader public interest? Finally, who should be accountable socially irresponsible architecture? These questions are far more complex than simply answering, how "much energy is my building consuming?" This thesis argues that the society-driven issues related to the built environment are just as important as the ecological ones, if not more so.

I believe that architecture continues to have a significant role in providing greater social justice, though architectural factors alone cannot solve all or even most social and economic problems. Architects cannot "save the world," but architects can and must be part of the discussion. Likewise, economic and social initiatives that do not take into account physical context and the relationship between the built environment and the issues they seek to resolve will also fall short. A new architectural framework is necessary for engaging, empowering, and responding to stakeholder interests by measuring the success or failure of built or proposed work

in addressing or responding to the public interest, however difficult it is to discern what that public interest is. This framework is a design standard and a third-party rating system based on architectural, environmental and social criteria with the understanding that there will be overlap between these three overarching themes. This design standard prioritizes the public interest, recognizes the built environment and their designers as engaged participants along with their stakeholders, and seeks to expand participation among those who have a clear interest in the design of the built environment including businesses, city officials, state and federal programs, and of course all owners, users, and occupants.

This thesis represents my initial effort to synthesize current best practice on this topic, to develop an analytical framework to evaluate the social responsibility of architectural development projects, and to apply the framework's design criteria to an example project. This project will be a mixed-use, mixed-income development that is primarily housing. However, since upward social mobility is one of the main objectives of this architectural intervention, the program will require spaces beyond those traditionally associated with housing and may include, for example, educational facilities and sponsored higher-wage employment in office or light industrial type settings. (i.e. not just retail). The program is determined by a number of factors, including but not limited to the needs of community and the perceived feasibility of financing a project of a certain type and size for a given site. A real estate market that is considered a high-risk by private lenders will be one that will have trouble attracting development, especially for low-income housing. The great majority of housing in the United States is produced by for-profit developers, including the majority of affordable units, albeit with the help of an assortment government subsidies at the federal and local levels.

Therefore, the role of the government in producing and financing affordable housing, including programs such as HOPE VI, low-income housing tax credits, and demand-based voucher programs will subject of further investigation and critique. The housing project would be situated near the Anacostia Metro Station in southeast Washington, DC, an area that suffers from many economic and social challenges that will be discussed later.

While this affordable housing project will not necessarily aim to one that could seek LEED-certification, it will be useful to understand how design standards such as LEED and Energy Star requirements have impacted the real estate market in Washington, DC specifically in the design of commercial office buildings.

GSA uses the U.S. Green Building Council's LEED certification system to rate buildings because in an effort to make the federal workplaces more sustainable GSA sought a method to gauge the level of sustainability of its workforce and building inventory. In 2006 the GSA Administrator concluded of the all the rating systems LEED was the most credible.[2] Since 2007, the Energy Independence and Security Act has required GSA to re-evaluate the rating systems every five years. Since then, the minimum LEED certification for new or "substantially" renovated federally-owned buildings has increased from LEED Silver to LEED Gold. As of February 2014, GSA has 114 buildings in its federally-owned inventory that are LEED-certified. The National Capital Region, which includes Washington, DC and parts of Maryland and Virginia, has fifteen owned buildings and three leased buildings that are LEED-certified.[3] That is second only to the Great Lakes Region which has twenty LEED-certified federally-owned buildings in its inventory. Energy Star is an international standard for energy efficiency created

[2] "LEED Building Information." *GSA.gov*. U.S. General Services Administration. n.d. 14 May 2014

[3] "GSA Projects LEED Information." U.S. General Services Administration. 24 Feb 2014. PDF file.

by the Environmental Protection Agency and has been used to rate energy performance in buildings since Executive order 13123 "Greening the Government through Efficient Energy Management" was published in 1999. [4]

LEED and Energy Star are integral to lease agreements because they serve as part of the federal government's strategy to reduce its impact on the natural environment and save taxpayer dollars by being more energy efficient. Many developers in Washington, DC metro area have responded to GSA's initiative because it makes their buildings more marketable to federal tenants. Therefore the designation of LEED and Energy Star as design standards for federally-occupied buildings in general and specifically leased buildings means that a rating system or design standard such as LEED has the potential to significantly affect the direction of the real estate market with respect to design.

SEED (Social Economic Environmental Design) on the other hand, is a certification process created by the Public Interest Design Institute, which responds to social and economic issues in addition to the environmental issues that LEED aims to address. The challenge that designers and concerned citizens alike face is to help SEED or something like it obtain the support and credibility of a standard like LEED so that we can integrate social needs with environmental responsibility, especially since there is significant overlap between the two. This subject will be discussed in greater detail in the main body of the thesis. Even though the program in the Anacostia site is predominantly residential affordable and accessible work spaces should be considered if it will benefit the community, while also taking into account the financial feasibility of including certain programs.

[4] "Executive Order 13123, and You." Environmental Protection Agency. October 2002. PDF file.

Dedication

I dedicate this thesis to my wife, Janine, who without her loving support and patience, I would not have been able to succeed in obtaining my master's degree.

Acknowledgements

I would like to thank my thesis committee, in particular Professor Garth Rockcastle, for sharing their wisdom and guiding me through this journey.

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"The most fundamental questions address *what is built for whom*: expenditures for museums, skyscrapers, concert halls, and other objects of bourgeois gratification come at the expense of important and necessary social services, not to mention adequate housing at modest prices. Architects quietly design for the very same public-private partnerships that are responsible for razing masses of low-income housing…

…Such destruction, however, is not simply the casual by-product of urban downtowns; it is the direct consequence of a whole series of related actions issuing from a particular set of economic and social arrangements."

Diane Ghirardo, *Out of Site*

The threat of destruction is a reality that worries residents of Anacostia in southeast Washington, DC who see the neighborhood's historic buildings as the last remnants of their cultural history.[5] There are two historic buildings near collapse remaining on what is known as the "Big K" site in Anacostia, known by that name because of the "Big K" painted in big blue letters on the side an abandoned liquor store on the corner of Martin Luther King Jr Ave SE and Morris Road SE. Both of the historic Victorian houses are boarded up. Nearby one can see other 19th century homes that are also slowly falling apart. Developers and even some local residents want to tear these down and build something that makes better use of the site.[6] One of the latest compromises that city officials have offered is to move these buildings a few blocks away, but this plan is also being opposed by some residents.[7] The battle over the future of this site is a microcosm of the larger issue of promoting social justice through the built environment.

The purpose of this thesis is to analyze the relationship between the built environment and society and to investigate how socially responsible design can and must contribute to a more

[5] Muller, John. "Plans to redevelop Anacostia's Big K site hinge on two historic houses." *Greater Greater Washington*. 18 Feb 2014. Web. 17 May 2014.
[6] Ibid.
[7] Harris, Hamil R. "Debate over Anacostia houses focuses on preservation, commercial development."

just society. The architecture profession not only has the ability to address social problems but the responsibility to do so. As part of a larger building culture it is understood that architecture responds to various forces that are often beyond its control or influence. However, architecture by its very nature has an impact on our collective physical environment as well as our collective psyche. It is a reciprocal relationship where societal norms and circumstances are made manifest in the built and natural environment and these in turn affect its inhabitants individually and collectively. It is a cycle, a give-and-take, a set of principles, assertions, and assumptions overlapping ideas of space and place.

The architect could play a significant part as one interprets societal forces into physical form, much like a sculptor or therapist, but on much, much larger scale. Nevertheless, the modern architect has a “scope of work” that has been defined for him or her over time but with increased specificity over the last few decades. Even in this “limited” capacity architects still wield an enormous amount of power often unrecognized through their design choices. There appears to be a line or barrier, both real and perceived, between what an architect can do and what an architect should do. Many architects have attempted to break out of this box for different reasons in pursuit of their own agendas. In this spirit, this thesis endorses the attitude that the architects must continue push the boundaries of what an architect does to include a consideration for social justice through public interest design. Individual architects who are sensitive to how their work and the work of others is affecting society have drawn some significant attention from their peers and have created some momentum for what in reality is a global humanitarian effort.

Organizations such as Architecture for Humanity have been successful in promoting small interventions that make a big difference to the communities where they have lent their services. “The physical design of our homes, neighborhoods, and communities shapes every

aspect of our lives. Yet too often architects are desperately needed in the places where they can least be afforded."[8] The compilation of case studies in Architecture for Humanity's first publication, *Design like You Give a Damn*, clearly illustrates that there is no shortage of energy, ideas, and people who are socially conscious. Some of the significant challenges they face include stubborn, short-sighted policy, lack of money to compensate designers fairly for their time, lack of inter-disciplinary cooperation, and a general lack of understanding of the relationship between social problems and the built environment. Each of these challenges have their own history and complexities which merit their own investigations.

Defining social responsibility

In order to advance a paradigm that promotes socially responsible architecture, we need to clarify more precisely what we mean by these terms. For the purpose of this thesis, we will define socially responsible architecture as that which aims to:

a. create beautiful, meaningful spaces that elevate human dignity and improve the standard of living
b. provide more equitable access to a healthy and safe environment and,
c. provide more equitable distribution of resources to and within that environment.

One would expect that a wealthy, "postindustrial" country such as the United States could easily provide basic shelter for all of its residents. The assumption of a society with equitable shelter is that people live in "an environment that ensures the safety of its inhabitants and protection from the elements, acting as a gateway to the satisfaction of basic needs."[9]

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[8] Architecture for Humanity. *Design Like You Give a Damn*. New York: Metropolis Books, 2006. Print.

[9] Rosenthal, Hannah. "Expanding Architectural Practice to Advance Social Justice: Social Architecture Creates Equitable Shelter." M.S. Iowa State University, 2013. Print. United States – Iowa. p.x.

Unfortunately, because in the United States there are many cases where poverty prevents even basic shelter from the elements from being possible. Access to basic shelter is an issue for many, including communities of undocumented migrant workers along the U.S.-Mexican border, in Native American communities in the Southwest and in crumbling neighborhoods of inner cities all over the country. An architecture of social responsibility and social justice is one that identifies this basic need for and right to shelter and acts to use the built environment to empower those with few resources and little influence. Social justice as related to architecture is about significantly raising the level of ethics and the level empathy in our profession, from academia to the most celebrated design studios in the world.

The sites selected for this thesis are ones where spatial injustice is not nearly as extreme as what comes to mind when we think of the favelas of Rio de Janeiro or the slums of Mumbai. The issues here are more nuanced, especially in the case of downtown Silver Spring where the median household income is relatively high compared to Anacostia. Yet around the word, the forces that act on the built environment and the relationship between people and space is the same, barring specific cultural differences on the interpretation of "space." The reason that these two urban communities have been chosen for this thesis as opposed to a poor community in Mumbai has to do with the degree of informality. Urban informality is extremely relevant to the topic of social justice, but in the interest of time, in an urban North American community one can usually assume that there is an infrastructure already in place, there is some police presence and rule of law, etc. Even if these are lacking as in the case of poor inner-city neighborhoods across the United States, the situation is not as dire as those in developing countries.

A site in a thriving urban business district provides an opportunity to demonstrate that even in a community that seems relatively healthy and financially secure, there are opportunities

to respond to the needs of those who are not as well off and to recognize that there are many ways to employ socially responsible design.

Can architects be socially responsible?

With a preliminary definition of socially responsible architecture in hand we have to ask if this is even possible. In her essay "Can architects be socially responsible?" Margaret Crawford's suggest that this is possible but that the way the profession as it is currently structured creates significant obstacles for architects who want to use their craft to promote social justice.[10] Sure, there are individual architects who take it upon themselves to address a social need even if it means working pro bono, but in general engagement with social issues has been absent in the *professionally*-designed sector of the building culture.

Issues such as homelessness, affordable housing, and equitable urban design should fall within the core competence of the architect, but the profession is currently disengaged from these issues. People who need shelter either to house their family or their business will still build, just not with the help of licensed professionals who exist solely for that cause. "Over the past twenty years, as a profession [architects] have steadily moved away from engagement with any social issues, even those that fall within their realm of professional competence, such as housing, homelessness, the growing crisis in affordable housing, the loss of environmental quality, and the challenge posed by traffic-choked, increasingly unmanageable urban areas."[11] She cites that the reason for this is that like other modern professions, architects are part of a larger, complex social construct. The identity of individual professionals is shaped by the whole of the profession

[10] Crawford, Margaret. "Can Architects Be Socially Responsible?" *Out of Site: A Social Criticism of Architecture."* Diane Ghirardo. Ed. Seattle: Bay Press, 1991. Print. p. 27.

[11] Ibid. p. 27.

which is itself influenced by socioeconomic and political circumstances and the norms that it developed for itself as it evolved as a profession over the last century.

Crawford explains that the architecture profession has a unique problem resulting from an unresolved contradiction. This contradiction originates with the movement towards professionalization that began in the nineteenth century. Architects claimed authority over the technical component of building as well as artistic creativity. The nascent profession of architecture as we understand it today sought its own identity by distancing itself from engineers on one side and the builder or contractor on the other.[12]

Over time the profession has claimed more competency in aesthetics as opposed to structure, leaving complex technical work to engineers, but there was in inherent problem with this appropriation of the arts. Unlike painters who take individual risks by investing their own time and resources into their craft and can produce a painting relatively quickly, an architect requires a patron because his or her product requires a significant amount of resources in terms of money, time, material, etc. "Architecture's expensiveness inevitably binds it to the sources of finance and power, making it very difficult to achieve autonomy from bourgeois standards that art had fought for since its emancipation from aristocratic patronage."[13] The dependence on the patronage of elites disassociated architects from the residential and commercial market associated with the middle and working classes. Around the world his vacancy is "filled" by contractors, skilled and unskilled laborers, or in many cases, the slum dweller how makes a shelter with any available materials. They rely on their traditional building culture for constructing shelter, not the "expertise" of design professionals. This is Rudofsky's *Architecture*

[12] Ibid. p. 29.
[13] Ibid. p. 30.

without Architects.[14] "Only twenty percent of the total building output in developed societies is subject to the advice of the design profession, so that the greater part of the man-made environment escapes our creative intervention."[15]

While architects have increased their prestige by institutionalizing a set of core competencies, the profession is still at the mercy of market forces. Crawford differentiates between the "ideal" client and the actual sponsor.[16] The ideal client refers to the general public. They are users of public space and can experience the work of architects either directly or indirectly. However, the sponsor clients are the political and corporate elites who use their power to legitimize their control. The distinction between the owners and users as inhabitants is significant because the built environment is a reflection of a tradition of power. Using skyscrapers as one example, Peter Marcuse writes, "Megaprojects, increasingly enabled by the globalization of investment and concentrations of control in cities high in global hierarchy, are demonstrations of power, of the ability of dominant interests to impose their will on the preexisting structure of a city."[17]

Modernist architects in the 20th century tried to address this conflict of interests between these two clients. It was an opportunity for modernists to pursue modernist ideas including structural rationalism, functionalism, and social interest, particularly in Europe as represented by the Werkbund Exhibition in 1926 whose aim was to produce a model for social housing using new technologies and free of historical references.[18] However, a series of failures in government

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[14] Rudofsky, Bernard. *Architecture without Architects*. Albuquerque: University of New Mexico Press, 1987. Print.
[15] Frampton, Kenneth. "Reflections on the Autonomy of Architecture." *Out of Site: A Social Criticism of Architecture."* Diane Ghirardo. Ed. Seattle: Bay Press, 1991. Print. p. 17.
[16] Crawford. p. 32.
[17] Marcuse, Peter. "Tradition in a Global City?" *Traditional Dwellings and Settlements Review*, Vol XVII, No. II, Spring, 2006.
[18] Musgrove, John. "Modern Movement." *Grove Art Online*. *Oxford Art Online*. Oxford University Press. Web. 22 March 2014.

housing—including spectacular ones such as Pruitt-Igoe—and the demands on architects by their elite patrons further withdrew the profession from mass market housing in favor of work promising higher commissions but just as importantly, more prestige and legitimacy as the self-ascribed intellectual authority in building.

Professional licenses gave architects a professional monopoly over the design and documentation of certain building types, turning the profession into a class of elite designers. The cost of associating their craft with luxury meant giving up more autonomy as it became dependent on a narrow market. The area in which architects still retained influence was the realm of aesthetics and the ideologies or intellectual constructs devised to legitimize on aesthetic leaning or another. This relates to the public interest because at this point architecture moved "out of the world of social practice and into the realm of art."[19]

Art and Architecture

The subject of architecture as art is a contentious one, and it is one that can be broken up in a multitude of ways but there are two ideas relevant to this thesis and they have to do with:

1. the false dichotomy of low art versus high art and its effect on creating or negating prestige
2. the question of how much of architecture is exclusive to architecture and not to other arts. The relevance of art to socially-responsible architecture comes down to the question of whether not such a practice can produce beautiful spaces and forms and whether or not the masses are as entitled or worthy of beauty as the elites believe themselves to be.

[19] Ghirardo, Diane. "Introduction." *Out of Site: A Social Criticism of Architecture*. Diane Ghirardo. Ed. Seattle: Bay Press, 1991. Print. p. 9.

Architectural form conveys and embodies meaning, but that meaning should not be limited to artistic matters that are almost completely internal to architecture itself nor does the architect have complete authority over the intellectual discussion of meaning in the built environment. In other words, architects alone cannot determine what is relevant to architectural discourse because doing so tends to obviate social, economic, and political considerations. It also removes the majority of builders from the conversation.

Contractors and builders inherited the mass market from the elite builders, the architects, who distanced themselves from the masses.[20] This mass market is defined in part by commercial strips and mass housing, having been inherited by these contractors who both chase and affect public opinion in the matter of style and taste. This is an area of the building culture that reflects popular culture. Yet the great majority of buildings being constructed are not even considered architecture by most architects.[21]

The practice of excluding the majority of buildings from the realm of Architecture increases the stock of the architect as the design expert, increasing his or her prestige. The work is worth more. In this consumer-driven society the architect is a Designer and his or her name or the name of the firm is the label that is sought after. “Whatever problems, flaws, or weaknesses one might discern in non-architectural building—or “low art”—ignoring them, dismissing them out of hand, or failing to analyze the relationship between high and low are in effect means that one is not engaging in the act of criticism, but rather acting to preserve a particular status quo.”[22] The status quo mostly serves the interests of a small percentage of architects who come to

[20] Davis, Howard. *The Culture of Building*. New York: Oxford University Press, 2000. Print. p. 113.
[21] Ghirardo. p. 10.
[22] Ibid. p. 13.

represent high art in architecture, occupying not only the aesthetic but also the moral intellectual high ground.

As in fashion, the label is often more important than the actual design. An article of "designer" clothing is perceived to be of higher value because of the name associated with the piece, and there does not have to be a direct correlation between the cost and the quality and quantity of the material. Not only does it assume that all other non-designer clothing is inferior, it disassociates the designed object from the idea of design. In other words, the implication is that a dress at Wal-Mart was not actually "designed." In fact it was designed by someone, even if the materials, and dimensions of said dress were chosen for them because of restrictions of profit margin, target market, or other innumerable considerations. There may be many differences between the designer dress and the affordable dress like the quality of the material or notions of taste, but the fact that they were both *designed* is not one of them.

If we were to agree to prioritize social responsibility over art, architects are not being forced to decide between social values or beauty because they are not mutually-exclusive. In fact, a design that is generally recognized as aesthetically beautiful can only serve to increase the social good and reinforce the idea that public interest design continues to be as much a visual exercise as an ethical one. The idea is to give each the appropriate attention it requires.

New Standards, New Tools

Building professionals need a new, framework that values social concerns as much as environmental ones and integrates aesthetic values. In its ideal form, this framework would be as capable of judging the social merits and of assessing the strengths and weaknesses of a project in the poorest slums of Mumbai as it is of a project on the wealthiest block of Manhattan. This standard is based on a conceptual framework but functions more like a tool or a guide. It is not a

just a theory to be discussed in the architecture community, but a guide to take to the field or be used in the office to aid architects with design development and help public officials see the implications of their proposals on the built environment. In order for the social architecture movement to be successful, there needs to be a more comprehensive and systematic approach to design development on one hand and peer review on the other. In other words, we need to determine a set of standards by which proposals can reviewed after having understood the various contexts like site, culture, and economic. As architects we need to have some common objectives while acknowledging that there will be challenges and opportunities that are site-specific or project-specific.

This means introducing a standard, a process, a system, and a network that ties these ideas to projects and to people and organizations in a culturally and professionally-recognized framework. Individual projects and interventions could work off one another through lessons learned, unique expertise, sources of funding, research, municipal relationships, etc. As significant as "urban acupuncture" interventions are to communities where they have succeeded, a collaborative network would turn the social architectural movement into a beautiful melody rather than a series of unrelated notes. To a limited extent, a working standard or metric will be created and used as an example in the design process. The following section analyzes existing rating systems will be analyzed for their strengths and weakness and identifies key lessons that are applied to the metrics designed in this thesis.

Existing certification and rating systems

U.S. Green Building Council's LEED rating system, which rates proposed buildings according to environmental and energy criteria developed by them, can serve as precedent where architectural rating systems are concerned. The Living Building Challenge also uses

environmental and energy criteria as the basis for certification but takes a more comprehensive approach by including criteria for social concerns and beauty. Unlike LEED, the Living Building Challenge gives its certification only after the building is built and it has proved to meet all criteria for at least one year after the building is constructed and occupied. The Living Building Challenge sets the bar so high that only a handful of buildings in the world are actually certified, whereas LEED-certified buildings number in the thousands.[23]

SEED, which stands for Social Economic Environmental Design, is emerging is a potentially useful rating system developed by Bryan Bell and the Public Interest Design Institute. Similar to LEED, SEED provides a professional accreditation. Whereas LEED focuses on expected energy use and environmental impact of new and existing buildings, SEED is community-based and focuses on the socioeconomic challenges of a community while also being environmentally responsible. SEED projects go through a few rounds of design and review using the SEED Evaluator which serves as a communication tool between the parties involved and it manages the steps in the process. The community creates its objectives and then the SEED evaluator leads it through the stages required for certification.

The advantage of a system like LEED is in the clarity of a simple point-based formula to rate buildings based on criteria developed by the USGBC. The disadvantage is that the number of points associated with a requirement can become arbitrary or they may not be properly weighed. For example, adding a bike rack in a new building should not be enough to cross the threshold from non-certified to LEED-certified. A new building receives its rating before it gets built since the proposal is being rated, not the building. In 2006 the USGBC commissioned a study which reported that LEED-certified buildings use energy 20-30 percent more efficiently

[23] Kriss, Jacob. "3 billion square feet — but who's counting?" *LEED*. U.S. Green Building Council. 8 Apr 2014. Web. 8 Apr 2014.

than the national average.[24] One of the major criticisms of this system is that LEED-certified buildings are not necessarily "greener" or environmentally-responsible than other new, non-certified buildings. Studies have shown that on average LEED-certified buildings consume the same amount of energy and produce the same amount of carbon emissions as comparable non-certified buildings.[25]

Despite these shortcomings, LEED can be considered successful and is relevant to social justice in architecture for two main reasons. First, LEED certification has brought much-needed attention to the environmental impact of buildings. Even the desire for the perceived prestige of designing or owning a LEED Platinum building, for example, is a positive step if it gets developers and design professionals interested and talking about green building solutions. Real estate developers use LEED certification as a selling point.

Secondly, although the USGBC is a nongovernmental, non-profit organization LEED certification has been adopted as a standard in government building contracts for federally-owned and leased buildings. In other words, LEED is now public policy, for better or for worse. Building "green" has become a multi-billion dollar industry,[26] and while this is not to say that we should continue to support a system that, according to the previously cited report by John Schofield, does not provide any actual benefit, it does warrant a discussion of the influence that such a widely-adopted standard has. Is LEED the best standard? Probably not, but the significance of LEED in this investigation of rating systems is the fact that it is so widely used. In order to for a conceptual framework of social responsibility to go from an academic exercise

[24] Scofield, John H. "Do LEED-certified buildings save energy? Not really..." *Energy and Buildings*. 41(2009): 1386-1390. Web. 23 March 2014.
[25]Ibid.

[26] Vittorio, Andrea. "USGBC Report Highlights Growth in Green Building Industry." *BNA*. Bloomberg, 16 August 2013. Web. 14 May 2014.

to an applicable practice, it needs the kind of international legitimacy experienced by LEED and certification would become required, not voluntary, as is the case in GSA leases and new construction. The hope is that the working framework that is created that it is capable of producing actual, measureable benefits compared to the average building with respect to social responsibility. The brief time for thesis research will limit the scope of this rating system. At a minimum it should suggest the major categories that a socially high-performing building would have to address. Architects need to be significantly more socially-responsible; a rating system or standard is needed to evaluate how socially-responsible architects are. If the profession is incapable of creating this standard on its own, then it needs to become a matter of public policy, where architects and other professionals in the building industry are forced to comply.

How do we actually measure those benefits, and how will be define success? Those are the most difficult questions but the answer will depend in part on how high we set the standard. The Living Building Challenge has the most rigorous design requirements and as a result, few buildings achieve the certification or even aspire to obtain it [needs citation-and examples]. Part of the reason for this is that our urban infrastructure is not equipped to facilitate this kind of design strategy. For example, zero net energy (ZNE) is one of the requirements for the LBC certification, but the electrical demand is too high and the electrical production from photovoltaic panels is still too low to make ZNE a realistic goal for all new urban construction.[27] The point is that we know that we need to set our standards high, but how high is so high that we just set ourselves up for failure? Either way this conceptual framework, reconstructed as rating system or

[27] Rajkovich, Nicholas B., William C. Miller and Roland J. Risser. "The Prospect of Zero Net Energy Buildings in the United States." Energy Efficiency. Ed. Fereidoon P. Sioshansi. New York: Academic Press, 2013. 253-260. Print. p. 23.

design standard, should allow for reevaluation and reflection so that it can evolve over time to better respond to the mission of social justice.

A matter of public policy

The implication is that this framework may need to be absorbed by public policy in some form, ideally at a national, federal level. This could mean incentives or it could mean penalties, but the idea is that the building culture would be compelled to respond to issues of social and spatial justice. This is not new and it is understandable if architecture professionals already feel burdened by restrictions and regulations are wary of another layer of bureaucracy. If the architect is only really responsible for the artistic expression of architecture then how are the social impacts of building addressed and who is responsible for them? If the architects do not have the agency or tools due to limitations or the nature of the profession as we find it today, then by what means can the architect respond to social concerns? Public policy is used as a last resort to force the profession to formally address those issues which architects would prefer to avoid.

The potential risk of over-regulation is that we lose the greatest advantage of architectural training, which provides options and solutions through a better design process. Design thinking can and does empower the architect and various stakeholders to solve social issues creatively—despite the challenges—and not have to rely on laws and building codes alone. Because there will always be a broad range of social involvement of architects and the larger building culture, it would be useful to break down the relationship between architects and social justice into three categories of social responsibility and participation.

The first is “design as activism.” An architect in this group is one who instigates, probes, initiates, asserts, etc.; the architect is pro-active. The architect reacts to society writ large and does not wait for a client to come asking for help. In this alternate universe, the architect looks

for sources of funding too. The architect is a developer, taking on risk—but also the po and more than just a "good neighbor." This encompasses a small group of architects even though the number is growing thanks to the increased attention given to public interest design. The second category is defined by architects who are occasionally involved in projects that pertain to social justice including affordable housing. The architect does not initiate the project but is brought in by a developer or an organization and the architect is responsible for the design, and may or may not be involved in funding or budget issues beyond what is typical of the practice.

Architects in the third group aim to meet the minimum code and no more. This may or may not be the largest group, but it seems to be the prevailing attitude. Who wants to think about the millions of people suffering in decaying, poisoned urban environments when we can marvel at the sweeping curves of a Zaha Hadid project? She made it clear that human suffering is not her problem, even if it is her building that is associated with the misery of hundreds of poor laborers working in a corrupt industry.[28]

There is certainly overlap between the three categories. For example, even architects who prefer to design for those most in need have to take more traditional work in order to maintain a practice because there is currently inadequate support in place for these designers to make a fair fee for such work. The grant-writing component of SEED can be a useful resource because lack of financial support is a very real challenge in design for social justice. Realistically, for socially responsible architecture to be successful there needs to be a way to make sure that the architect can make a living doing this work.

[28] Riach, James. "Zaha Hadid defends Qatar World Cup role following migrant worker deaths." *The Guardian*. 25 February 2014. Web. 29 March 2014

Architecture is a service industry. The architect provides a service for a client and is paid a fee. That service takes the shape of document, many of which are documents, which a contractor then translates into a physical product, a building. In order to break from this mold we need to look at the organizations that have shaped and continue to shape our building culture.

Pedagogy and Practice

Clearly there are forces that are external to the profession that complicate or at least do not encourage intervention based on social values and needs. An example is the current relationship between architect and client. It seems common practice for an architecture firm to maintain a close relationship with certain developers who have a need for design services. The developer provides the site and the funding and the architect provides the vision and the required documents. If the developers provide enough work, the architecture firm does not have to search beyond these established relationships.

At most there is a tacit acknowledgement that architecture does have a significant social impact. The NAAB and AIA are two organizations that deserve more scrutiny in this respect. The NAAB is one because of the influence it has over college programs and thus architectural education. That which is omitted from an undergraduate or graduate program in architecture can be just as significant as what is taught. The AIA is the other because of the obvious influence it has over the profession. In many ways it defines the profession. Can we or should we abandon the AIA? Can we push for a pedagogy that ensures that every school of architecture that identifies itself as such must meet a minimum of explicitly articulated social requirements? What are the ways that we can change or influence attitudes early in a person's career so that when are exposed to these challenges in practice they can be more prepared? I know of students who have

confessed that they never thought of architecture in terms of social fairness until the issue was introduced to them.

This is also a criticism of a tendency in academia to praise projects where the intervention is nothing more than hypothetical solution looking for a nonexistent problem. We should not have to waste time asking whether socially-responsible architecture is relevant, but rather asking, discussing, and debating what the best methods are. There is always a social component that can be explored, even in academia. In fact, a design education enables a way of thinking that is conducive to breaking down difficult, abstract problems and then synthesizing them in a way that is more approachable if not better understood.

Design Thinking

The backbone of a good architectural design education is design thinking. Students are not taught what to build but how to think about what, when, where, and why we build. An education in design is an introduction to a process or a methodology that allows the designer to think about a problem by materializing abstract knowledge, ideas, and data into different forms that are more easily communicated and understood. Design thinking is a process that architects and other designers use to clarify complex issues and engage people across multiple disciplines.

Yet design thinking is process that does not have to be reserved only for designers just as architects do not need to limit this process to traditional "design objects" or "things."[29] Design thinking focuses on human experience which means that throughout the design process the designer must be take into account the human environment or the social context in which design is taking place and understand that the for the receiver or end user the meaning conveyed by the design may be different from the designer's intention.

[29] Byogvinsson, Erling, Pelle Ehn, and Per-Anders Hillgren. "Design Things and Design Thinking: Contemporary Participatory Design Challenges." Design Issues. (2012): 101-116. p. 101.

Design thinking is a method of problems solving that is typically associated with creativity and visualization. There are two critical components to design thinking: one is iteration, which is the process of testing an idea, studying the results, adjusting the approach and trying again over and over again in an almost endless loop. Large, complex issues are broken down into more manageable parts, analyzed, and reconstructed, and then the process repeats itself. The design is modified as new information is made available—such as the availability of a particular material for a building or aerodynamic improvements derived from wind tunnel tests for cars. There are many designers—and architects are no exception—who would argue that a design never done because more iterations will lead to a better resolution of the "problem."

A second important component of design thinking is visual thinking and representation. The ability to visualize the issue in question for oneself is a skill that can be useful in just about any discipline because the act of giving form to an idea may uncover solutions or new questions that were not thought of before. A designer can literally draw together ideas and relationships as way of working towards a solution. The design process involves observation, interpretation, experimentation and various forms of representation whereby the designer communicates a synthesized understanding of the content and solution to the problem.

Iterating and changing the medium through which the idea is given form is important because it leads to unexpected discoveries. Unexpected discoveries occur when the designer observes some element of the design or the content in a new light which then leads him or her on an alternate path towards a better design.[30] Alternating between specific activities within design thinking such as sketching or modeling help create these unexpected discoveries whose meaning will differ according to different designers.

[30] Razzouk, Rim and Valerie Shute. "What is Design Thinking and Why is it Important?" Review of Educational Research. (2012): 330-348. PDF File. p. 335.

The significance of design as meaning-making has to do with this relationship between content and form and the influence of the designer on the content, not just the graphical representation or the design product. The designer inevitably creates some meaning in transforming content into form. However, meaning ultimately resides in the receiver, so the translation of data into form is only one part of a design process that is nonlinear. "The designer shares responsibility with the receiver for the proper meaning."[31]

Although neither the designer nor the receiver have full control of the meaning of the design, the designer must understand that the objective of design is not the design itself, but the meaning or the implications that the design represents as understood or experienced by the receiver. Kazmierczak explains that meaning is what happens when a person comes into contact with a design. She argues that if the design does not have the intended effect on the receiver, then the design is "unsuccessful." That may often be the case for certain consumer products with specific uses, but we should be careful not to generalize and state that a design is only successful if the meaning is consistent among different receivers or users. This is especially true with buildings and designed spaces, where control over meaning is limited at best.

Even relatively common consumer product such as a contemporary smartphone has many more layers of meaning of varying complexity than one may initially think. In the design of its interface both the designer and the user depend on commonly understood signs and symbols to communicate intent (on the designer's side) and understand the intent (on the user's end). If we only accept this narrow view of design then we miss the fact that the device itself conveys a different meaning to different people depending on a myriad of variables including the brand of the phone and what that means, the economic status of the individual what that may mean,

[31] Kazmiercak, Elzbieta T. "Design as Meaning Making: From Making Things to the Design of Thinking. *Design Issues*. (2003): 45-59. PDF File. p. 49.

whether the phone is always ringing or is usually silent, etc. The relationship between content, the receiver, and meaning is a complex one even with a device that seemingly has a clear design intention.

Design as a meaning-making implies that behavior that comes as a result of contact with the design is also partly the responsibility of the designer. Therefore design thinking, which "[focuses] the design around the concerns, interests, and values of the users," is critical for understanding the reciprocal relationship between the design of the built environment and the actions of groups and individuals in society.[32]

The designer's ability to understand and communicate an idea visually and convey meaning are paramount, but Rim Razzouk and Valerie Shute have highlighted other characteristics of design thinkers. These include being able to: respond to a problem at the scale of a human being and human experience; look for multiple solutions to a problem; be able to verbally explain their process when visuals are not enough; to cooperate in a team and work well with other people (particularly across disciplines); to continue to come up with alternatives before making a decision; and finally, to "treat problems as system problems with opportunities for system solutions involving different procedures and concepts to create a holistic solution."[33] This last characteristic is one that similar to what Erling Bjogvinsson describes as "infrastructuring," which essentially means that a design should not be considered complete when the project ends because the ultimate goal is to create a positive human environment, and this requires continued support.[34] A framework for social justice through design of the built environment aims to build such an environment. What we should aspire to as designers is not a

[32] Denning, Peter J. The Profession of IT: Design Thinking. Communications of the ACM. (2013): 29-31. PDF File. p. 30.
[33] Razzouk. p. 336.
[34] Byogvinsson. p. 103.

better building as the object of design but rather a healthy ecosystem that can address the needs of the users long after the building is constructed.

Bjogvinsson argues that a fundamental challenge for designers and the design community is to move from designing "things" (objects) to designing Things (socio-material assemblies)."[35] They begin by referencing Change by Design, which describes how designers should be involved in socially innovative design, that design is a collaborative effort, and that the previously-mentioned practices of experimentation, iteration, and early prototyping are very important. Part of their argument stems from their scholarship in participatory design, a process where various stakeholders are engaged in the design process with the idea that those affected by the design should have a say in the design. It is a democratic, inclusive approach to addressing an issue that is particularly important when serious conflicting points of view can be anticipated. Rather than avoiding conflict it engages would-be adversaries in a more constructive discussion.[36]

We care about the built environment because we care about the health and wellbeing of the people in that environment. If we agree that a good architectural design depends on understanding the unique conditions of the site, then we must also extend that understanding to the people and culture of that built environment. Hannes Meyer put it succinctly when he said "Architecture is a process of giving form and pattern to the social life of the community. Architecture is not an individual act performed by an artist-architect and charged with his emotions. Building is a collective action."[37]

Bjogvinsson and his colleagues identify a challenge beyond that of the intended design, and that is the challenge of setting up a framework or "infrastructure" that supports the design

[35] Ibid. p. 102.
[36] Ibid. p. 109.
[37] Stohr, Kate. "100 Years of Humanitarian Design." *Design Like You Give a Damn*. Architecture for Humanity. Ed. New York: Metropolis Books, 2006. Print.

after the design project is considered complete. In a traditional participatory design approach the designers try to anticipate the actual use or effect of the design. Here the end users are identifiable and are invited to participate. One step beyond this is incorporating into the design the ability for future designers, stakeholders, and users to be continued participants of the design.

This is important because *envisioned use* cannot be guaranteed to match *actual use.* It leaves the design somewhat open-ended so that the network of relationships that is created during the early design phase can be utilized to discover ways to adapt or configure the design in a way that was not envisioned before. In other words, rather than designing an object we would be designing a platform for action and social innovation. Design during the project may not be able to predict with exactitude what will happen after the project is completed, but it can anticipate that it will be appropriated and re-appropriated, and it accepts that meaning is neither universal nor static. "Design is no longer a tool for the development of function, innovative consumer products but is increasingly seen as a process for radical change."[38]

"Design after design" depends on the creation of ongoing working relationships between designers, users, and other stakeholders. Because a one-size-fits all approach to design does not work for everyone, making sure that other voices can be heard in a collaborative environment makes design thinking an important force for making design that is socially responsible and meaningful.

[38] Ibid. p. 110.

Affordable housing: context and process

"With promising increases in home construction, sales, and prices, the housing market gained steam in early 2013. But when interest rates notched up at mid-year, momentum slowed. This moderation is likely to persist until job growth manages to lift household incomes. Even amid a broader recovery, though, many hard-hit communities still struggle and millions of households continue to pay excessive shares of income for housing"[39]

What is affordable housing and who is affected?

Housing is considered affordable if not more than thirty percent of the household income goes towards paying for housing costs. This a "rule of thumb" that heads of households use to determine whether housing is affordable, but it is also the income-to-housing cost ratio that the government agencies use to determine eligibility for certain housing subsidies[40]. However, the term "affordable housing" usually refers to public housing or subsidized housing for poor and working-class families and individuals. The difference between public housing and subsidized housing is that public housing is owned by the local housing authority whereas in subsidized housing the building is owned and can be owned privately or by a non-profit organization. Subsidies can also take many forms, such as vouchers or tax credits for developers. In certain metropolitan markets housing is effectively unaffordable when using the thirty percent rule of thumb even for individuals and families who would be considered middle class.

Housing is a fixed cost compared to food and other necessities, and affordability is a function of family size and income. When wages cannot keep up with the cost of housing a low-income family will have to make sacrifices in quantity and quality of food, clothing, and other

[39] Joint Center for Housing Studies of Harvard University. *The State of the Nation's Housing.* 2014. PDF file.
[40] Stone, Michael E. "What is housing affordability? The case for the residual income approach." *The Affordable Housing Reader*. J. Rosie Tighe and Elizabeth J. Mueller. Eds. New York: Routledge, 2013. 95-110. Print.

necessities that can significantly impact their health, safety, and quality of life.[41] A 2011 report by the Working Poor Families Project defines low-income families as those who earn less than twice the federal poverty line, so in 2011 the threshold for a family of four was $45,622.[42] The types of individuals and families that struggle to find affordable housing vary greatly. A disproportionate number of these families are racial minorities, who not only earn less on average compared to similarly-sized white families, but prospective Hispanic and black homeowners are two to three times more likely than whites to have their mortgage applications rejected.[43] Sadly, statistics that correlate income, race, and the affordability of housing are numerous, but a few are worth discussing.

According to a 2011 U.S. Census survey the number of low-income working families rose from 10.2 million in 2010 to 10.4 million in 2011 representing about one third of all working families and more than 47 million people in the United States.[44] Meanwhile, the income gap between the wealthiest families and the poorest families continues to widen. "Low-income" families are those whose household income is below 80 percent of the area's median income (AMI).[45] Those below 50 percent are "very-low-income" and below 25 percent are "extremely-low-income." The U.S. Office of Management and Budget defines low-income households as households with incomes less than 200 percent of the federal poverty level.[46]

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[41] Ibid. p. 95.
[42] Roberts, Brandon, Deborah Povich, and Mark Mather. "Low-income Working Families: The Growing Economic Gap." *The Working Poor Families Project*. 2012-2013. PDF file.
[43] Joint Center for Housing Studies of Harvard University. p. 20.
[44] "U.S. Low-Income Working Families Increasing." *Population Reference Bureau*. Jan 2013. Web. 15 July 2014
[45] Pyatok, Michael, R. Thomas Jones, and William W. Pettus. *Good Neighbors: Affordable Family Housing*. McGraw-Hill: Washington, 1997. Print. p. 14.
[46] "Children in Low-Income Households with a High Housing Cost Burden." *Kids Count Data Center*. n.d. Web. 14 July 2014.

Across the country, wages are not high enough to keep up with the market value of homes.[47] The supply of affordable housing has steadily dropped while demand has increased. Supply has dropped due to the demolition of millions of low-income units.[48] Many of these existing units are the lowest-cost rentals, which are seeing the highest rate of growth in demand. Part of the reason why they are not being replaced quickly is because of the prohibitive costs constructing new affordable housing, especially those lowest-cost rental units. HUD's HOPE VI program changed its policy where previously every demolished unit had to be replaced on a one-to-one ratio. Instead of replacing every unit, HUD has distributed rent vouchers with mixed success.[49] Two HUD cases studies will be discussed in more detail later.

The high cost of housing is impacting other demographics besides the ones traditionally associated with affordable housing. A weak labor market coupled with increasing debt due to student loans means that young adults are also having more difficulty than ever finding affordable housing. Homeownership rates between 25-38 year olds are down almost nine percent from 2004 to 2013.[50] With less income, many young adults are spending much more than the recommended limit of thirty percent of their income on housing costs and therefore spending much less on other goods and services. This has also meant that the number of adults in their 30s that live with their parents has been increasing over the last several years putting an additional burden on families who themselves are face hardship due to low wages and the high cost of living.[51]

[47] Joint Center for Housing Studies of Harvard University. p. 14.
[48] Ibid. p. 25.
[49] Engdahl, Lora. "New Holly, Seattle." From Despair to Hope. Henry G. Cisneros and Lora Engdahl. Ed. Washington: Brookings Institution Press, 2009. Print. p. 93.
[50] Joint Center for Housing Studies of Harvard University. p. 17.
[51] Ibid. p. 13.

In the rental market there are generally two approaches to housing low-income families. One is to build housing that is one hundred percent affordable, and the other is to build mixed-income housing. A third option would be homeownership. The question of whether or not it is better to invest in a path towards homeownership or put more resources into subsidizing rent for affordable housing is an important and relevant one, but it is outside of the scope of this thesis. In part this is due to the limited time to investigate this option but also because a 2013 market study of the "Big K site"—which is across the street from the site being developed in this thesis—determined that the "highest and best use" is market-rate apartments, tax credit apartments, or office.[52]

The developer's decision to build a one hundred percent affordable building versus a mixed-income building will vary depending on the cost of construction, perceived need from a market analysis, zoning, and how the project is financed, for example. From the community's perspective, long-time residents may prefer mixed-income housing even if there is a greater need of lower-rent units because of the stigma associated with low-income housing—e.g. unattractive architecture, transient occupants, higher crime rates, etc. "Stigmatization was attributable to poor design, often shoddy construction, inadequate property repairs and maintenance, neglected landscaping and pervasive crime. Plagued by these severe physical and socioeconomic problems, developing public housing was deemed politically and socially taboo."[53] They are concerned about how it may affect the development or the image of the community. While it is true that there are many public housing projects that have failed spectacularly—and most of these are

[52] Delta Associates. "Highest and Best Use Analysis: Big K Site." 13 May 2013. PDF file.
[53] Pyatok, Michael, R. Thomas Jones, and William W. Pettus. *Good Neighbors: Affordable Family Housing.* Washington: McGraw-Hill, 1997.Print. P. 9

being torn down—affordable housing and mixed-income housing can be designed to be just as safe and attractive as market rate buildings.

As mentioned, there is a lingering perception that for some segments of the population affordable housing is a "transitory accommodation." Unfortunately, subsidized affordable housing is not a temporary life circumstance for the majority of families who are over-burdened by their housing costs. The belief is that these people would typically be living middle-class lifestyles, but at the moment they need temporary support before they get back on their feet.[54] In the District of Columbia this concept is being applied to homeless families in a process known as "rapid rehousing."[55]

Rapid rehousing is a program promoted by District Mayor Vincent Gray that temporarily places homeless families in subsidized apartments for a few months. Not surprisingly, these families cannot afford the rising rents after this period is over, the implication being that they would once again find themselves back on the street. The program simply does not address the main factors of this housing crisis, which are low wages, low supply of affordable housing stock, and high cost of rent (which is related to supply and demand of housing). Recent studies such as Harvard's 2014 State of the Nation's Housing indicate the housing market is recovering and that there is housing stock available but neither where people need it the most nor at the price range that they can afford.[56]

Whether a housing development is one hundred percent affordable or mixed-income, it can act as a catalyst, the first step in revitalizing an existing community. New, affordable housing

[54] Pyatok. p. 9.
[55] Samuels, Robert. "Six possible solutions to the affordable housing crisis." Washington Post. July 2. July 29, 2014
[56] Joint Center for Housing Studies of Harvard University. p. 5.

may be complimented by non-residential public and private investment to attract further development and new residents. The location and type of housing depends on the city, land availability, and the condition of the existing housing stock. Publicly-owned land is usually at the top of the list when it comes to site selection, even if there is an existing building on the site. For example, Washington, DC, Fairfax and Arlington, both of which are in Virginia and within the greater metropolitan area of DC are looking to repurpose libraries, fire stations, and schools (Samuels). According to Michael Pyatok, "affordable housing often initiated community improvements because it may require less public investment and lead time compared to other public investments."[57]

Where major public investments in infrastructure come first, great effort should be taken design what is in the greater public interest, and at this moment it is clear that more affordable housing is at the top of that list. The most visible and controversial recent public investment the DC metro area has arguably been the construction of five new Metro Rail stations in northern Virginia. In July 2014 the Washington Metro Transit Authority officially opened the new stations along the new Silver Line, which connects Tysons Corner, Virginia to downtown Washington, DC and the rest of the metro area. The land around these Metro stations is largely undeveloped, consisting mostly of car dealerships, but developers have big plans to increase density in these areas.[58]

At least a couple of high-profile office buildings have already been completed.[59] Relatively few people actually live in Tyson's corner, but there are plans to construct several

[57] Pyatok. p. 33.
[58] "What's along the Silver Line?" *Washington Post*. 26 July 2014. Web. 10 Aug 2014.
[59] O'Connell, Jonathan. "With Silver Line, will people live in Tysons Corner?" *Washington Post*. 27 July 2014. Web. 28 July 2014.

high-rise apartments over the next decade.[60] The development in and around Tysons corner will be an opportunity to incorporate affordable housing by requiring that a significant percentage of units be below market-rate in which case both the affordable units and the market rate units would be constructed and financed simultaneously. Whichever approach is taken by the designers, developers, and planners, market-rate housing should be indistinguishable from affordable housing. Again, housing affordability has to do with more than the cost of rent. Low-income families have the most to gain from being near new public transit hubs, and should have the same right to benefit these public investments.

Beginning the design process

The complexity and difficulty of the problem of affordable housing is daunting. We are already aware that there are many non-design factors and policies that affect housing availability and affordability. Many of the changes that must happen are political. As a society we need to come to terms with the reality that issues of affordable housing (in the broader sense of the term) has an enormous effect on our national economy and wellbeing. Government subsidies are still required to cover the gap between what the market demands and what low-income families can afford. As baby-boomers retire and the average age of Americans increases, we have understand what that means in terms of housing, specialized care, and other services.

Furthermore, affordable housing has to go hand in hand with new and better employment opportunities and especially higher wages. With the power of design thinking we can even conceive of ways of how the built environment can help enable entrepreneurs and others create new jobs and create wealth and opportunities for their communities.

[60] O'Connell, Jonathan. "Real estate enters the era of 'hackable' buildings." *Washington Post.* 10 Mar 2014. Web. 28 July 2014.

Yet, what is the role of design? What can architects and designers do to mitigate this social disaster? In *Good Neighbors: Affordable Family Housing,* the authors give an overview of a process for developing affordable housing that they have found to be successful and community participation is at its core. Community planning is made up of four components: a housing needs assessment, goals and strategies, evaluation of present context, and community vision.[61] The housing needs assessment is intended to evaluate the housing market and determine how affordable the existing stock of housing is and how wide the affordability gap is. The architect guides the team to resolve physical, social, and cost issues.

The community may need completely new housing, rehabilitated housing, or a mix of both. Short-term and long-term planning can help the community determine what the housing priorities are and the amount of time and resources that each requires. Because affordability is also tied to circumstances of the local economy, a community plan should also include various employment opportunities and public services.

The existing context should be documented and discussed so that all of the participants can understand how the community is perceived. Individual experiences and feelings about the community as a whole or individual spaces or buildings are important not just for understanding the context but to for identifying features of social and cultural significance. “The analysis of the built environment of the community looks not just at the physical features and expression of the community, but also the underlying social and economic factors that affect the uses and appearances of buildings and places in the community.”[62]

[61] Pytok. p. 30.
[62] Pyatok. p. 31.

The community vision is the result of all of the previous analysis and discussions by community participants, designers, and stakeholders. A clear plan which includes the amount and type of resources as well as all of the public and private partnerships and relationships that will be required. A clear community-developed plan is required by HUD, for example, in order to be eligible for certain financial support for affordable housing.

While most new housing is built by private developers, private non-profit development corporations or community development corporations (CDCs) are also developing new housing, sometimes with the help of public funding. CDCs are important in some cities because compared to private developers CDCs rely heavily on community participation to produce efficient and affordable housing that responds to the community's needs. Because there are many more participants involved in planning and design process in community-based design, it is suggested a design committee be appointed with members that represent the CDC, neighborhood residents, potential users, and property managers.

Government agencies, programs, and policies

Even though financial resources are limited, there are numerous sources of financial support besides those managed by HUD, including state and local governments, redevelopment agencies and private foundations. A redevelopment agency uses tax exempt revenue from existing properties combined with bonds and other public debt to raise housing funds. Private foundations can finance specific amenities or help with education programs. Private lenders such as AHP (Affordable Housing Program) sponsored by Federal Home Loan Banks. These are specifically targeted at providing amenities to increase livability.

Without going into too much detail, it useful to discuss how some of the rules, restrictions and criteria of various agencies and organizations affect the design of affordable

housing. State agencies and local governments make financial awards, and require or recognize the inclusion of supportive services and amenities in affordable housing. Municipalities and states can create higher standards than federal ones. HUD may accept the higher standard even if the cost is greater.

Some state programs give awards for affordable housing projects based on a scoring system with extra points going to projects that are considered to be better designed, particularly when multiple proposals are being reviewed. "Local finance agencies which administer CDBG and HOME funds can incorporate criteria reflecting design quality into their standards for lending or granting local funds."[63] The Federal Tax Credit for Low Income Housing is one of these funding programs that state tax credit allocation committees use to fund high-scoring projects. The importance of using a set of criteria that defines and rewards high quality design cannot be emphasized enough.

Housing policies of state and local governments can have be just as significant as the funding that they may or not be able to provide. Planned unit development regulations and inclusionary zoning, respectively, allow communities to have more influence over the amount or condition of housing units in a particular project. Under a PUD, large sites can be developed at higher densities and conventional setback and other location regulations might be reduced in exchange for a better overall design.[64] It is a series of trade-offs. For example, the developer is given an incentive, such as higher density, and in return, the community will get some public benefit with the possibility that the lower development cost of the PUD will be passed on to the consumer. Although housing prices and rents of PUDs have not yielded lower rents, the designs

[63] Ibid. p. 42.
[64] Pyatok. p. 41

tend to very good otherwise. Zoning ordinances and regulations regulate the number and type of units, dimensions of lots, building types, parking, etc. In inclusionary zoning, a percentage of all units are required to be affordable, usually in exchange for higher density.

As a society we need to be better about setting high design standards for low-income demographics, defining our criteria for good design, and rewarding good design. It is possible to achieve this by granting addition public financial support for good design, but what we really need is for good design to be a requirement, not a bonus. The goal of this framework for socially and environmentally responsible architecture should not just be to prevent mediocre projects that do not may not be worth the significant number of resources invested in it. We should seek to reward good design and increase awareness among consumers, policy-makers, developers, designers and the public at large about what "design excellence" means. The idea that everyone is entitled to good design regardless of income should become ingrained in our public consciousness.

Design guides for affordable housing like *Good Neighbors* discuss many of the design elements that architects and design committees need to consider during the design process, and the authors highlight the importance of design excellence. Most of the suggestions are true for any building, not just affordable housing. These include, for example, researching the historical context, thinking about public versus private open spaces, crafting view corridors, designing efficient but enjoyable units, and defining spaces for cars and pedestrians, to name a few. Of course there will be items that are either unique to affordable housing or at least ones that would require more attention. Security is an especially important design challenge in Anacostia, which despite having improved security and police enforcement over the last two decades, has one of

the highest crime rates in the District.[65] People want to feel secure regardless of race and income and both city officials and designers are obligated to address this challenge. While the design should discourage unlawful behavior, the building should also feel inviting and approachable.

Good property management is important (along with affordable rates) for minimizing tenant turnover especially since rental units can be perceived to be unstable compared to homeownership and this perception is one more reason why certain residents might resist having affordable housing built in their community. In a response to questions asked to a focus group in Anacostia by a local developer at least one resident replied that the decision-makers "make sure to talk with homeowners, not the more transient residents."

[65] District of Columbia Metropolitan Police Department. 2014 Crime in the Past 12 Months; generated by Xavier Hickerson; using MPD Crime Map Search. < http://crimemap.dc.gov/CrimeMapSearch.aspx> (30 March 2014).

Anacostia

Site and Historical Context

One of the sites that will be developed is located in the vicinity of the Anacostia Metro Station, which lies just southwest of the line that delineates the Anacostia Historic District. Anacostia is located in southeast Washington, DC, in Ward 8 and east of the Anacostia River. The boundaries are Martin Luther King Avenue on the west, Good Hope Road on the north, Fendall Street on the East and Bangor Street and Morris Road on the south. Originally known as Uniontown, this neighborhood was one of the first suburbs of Washington, incorporated in 1854.[66] It was home to working class individuals many of whom were employed at the Navy Yard across the river. 1854 also brought regulations prohibiting the sale, rental or lease of property to people of African American or Irish descent. [67]

In 1888 African Americans made up about 15 percent of the residents of Anacostia.[68] European-Americans continued to make up the great majority of the population until the late 1950s and early 1960s when white middle class residents moved from inner cities to newly-constructed postwar suburbs in a national phenomenon known as "white flight."[69] The construction of the Anacostia Freeway (I-295) during the 1960s exacerbated this tendency by cutting the Anacostia neighborhood off from the waterfront.[70] The construction of large public housing complexes the East River area contributed to the change in demographics. African

[66] "Anacostia Historic District." *NPS.gov*. National Park Service, n.d. Web. 30 March 2014.
[67] Ibid.
[68] Ibid.
[69] Cook, Gretchen. "Historic Anacostia: Future Promise Breeds Cautious Optimism." *Urban Turf.* 24 May 2010. Web. 4 Apr 2014.
[70] Ibid.

Americans are cited as making up about 97 percent of the population according to the 2012 American Community Survey (ACS).[71]

Today, Ward 8, is the poorest neighborhood in the District and has an unemployment rate of about 25 percent-- one of the highest in the country.[72] The poverty rate is about 35 percent.[73] Lack of access to quality education, a high number of residents recently released from prison, drug trafficking, violent crime, and a lack of urban development and investment are all cited as reasons why this area of Washington continues to struggle.

A variety of architectural styles persist in the historic district including Italianate, Cottage style and Queen Anne.[74] The smaller scale of residential and commercial buildings reflect the relatively low density of the neighborhood. Residents have mixed feeling about the historic houses, many of which are falling apart. Some insist that they are what remain of Anacostia's past while other argue that development would bring much need jobs and investment.[75] According to the U.S. Census Bureau, the average household income in 2010 was $45,000 compared to $115,000 for the District of Columbia.[76]

Rationale for selection

Anacostia and the surrounding neighborhoods continue to suffer from many economic and social challenges as the previously cited poverty statistics for Ward 8 suggest. Adequate and affordable housing continues to be in high demand but short supply. There are currently 72,000

[71] "Community Facts: 20020." U.S. Census Bureau, 2012 American Community Survey. Web 18 May 2014.
[72] Homan, Timothy. "Unemployment Rate in Washington's Ward 8 Is Highest in U.S." *Bloomberg.* 30 March 2011. Web. 30 March 2014.
[73] Ibid.
[74] "Anacostia Historic District." *NPS.gov*
[75] Harris, Hamil R. "Debate over Anacostia houses focuses on preservation, commercial development." *The Washington Post.* 11 February 2014. Web. 3 April 2014.
[76] Ibid.

people on the waitlist for public housing in Washington, DC.[77] Homelessness has increased 13 percent from 2013 to 2014.[78] While more housing is desperately needed, the development of retail and commercial spaces is crucial to create employment and help empower local residents to improve their standard of living. Anacostia is one of the sites chosen for this thesis because it is a community that has much to gain from economic development, as well high potential for dense urban growth due to the proximity to a Metro station.

The benefits of transit-oriented design are well documented, and include improved air quality, pedestrian safety, improved transit ridership, reduced urban sprawl, and lower transportation cots (in terms of time and money) for residents.[79] It is common for Metro stations in downtown Washington to have mixed-use buildings constructed on top of the station. Anacostia Metro Station, however, is one of the few Metro stations in an urban area that has not yet seen significant development. Some redevelopment plans have met significant resistance by members of the community. For example, one of the latest plans to redevelop what is known as the "Big K" site on Martin Luther King Jr. Avenue has been on hold for more than five years due to disagreements between the residents and city officials over the best use of the land and the architectural style of the building, which has proven to be particularly contentious because the lot is adjacent to—but not in—Anacostia's historic district.[80]

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[77] DeBonis, Mike. D.C. "Housing Authority says it will re-examine waitlist, more than a year after closing it." *Washington Post*. 15 May 2014. Web. 15 May 2014.
[78] Weiner, Aaron. "There Are 13 Percent More Homeless D.C. Residents Than Last Year." *Washington City Paper*. 14 May 2014. Web. 15 May 2014.

[79] For a more detailed treatment, see: Cervero, Robert et al. "Transit-Oriented Development in the United States: Experiences, Challenges, and Prospects." Transportation Research Board, Transit Cooperative Research Program (TCRP) Report 102, 2004.
[80] Muller, John. "Long-awaited redevelopment in Anacostia could begin soon." *Greater Greater Washington*. 22 July 2013. Web. 16 May 2014.

Residents of Southeast DC are understandably skeptical when a large developer comes in, demolishes existing housing and builds market rate housing in its stead. The long history of discrimination, poverty, violence, and drug abuse is a reality which has to be considered. In neighborhoods with such a complicated and multifaceted history, site analysis must not only consider geographical and architectural elements, but also the perspectives, needs and desires of the surrounding community. In the case of Anacostia, this site analysis is very challenging because of the historical context, the existing circumstances and biases and the perception Anacostia residents have of "outsiders," especially if they are white. This is a logical choice for a thesis asserting the importance of socially responsible architecture, despite the overwhelming complexity. The most vulnerable people tend to be the ones with the least access to resources of any kind, especially professional design services. Design is badly needed in impoverished areas, even when the odds are heavily stacked against success as the designer initially defines it. The resulting project including the design process will be an exercise in "design as activism," but it will also be an exercise in patience, resilience, humility, and empathy.

Anacostia Preliminary Site Analysis

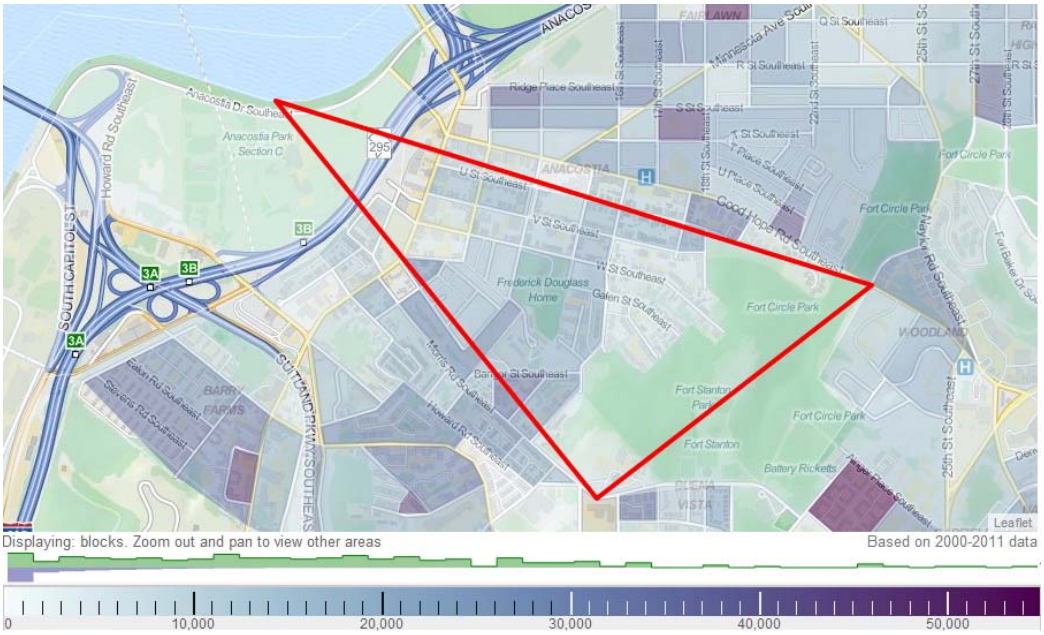

Figure 1 – Anacostia Density, people per square mile. [81]

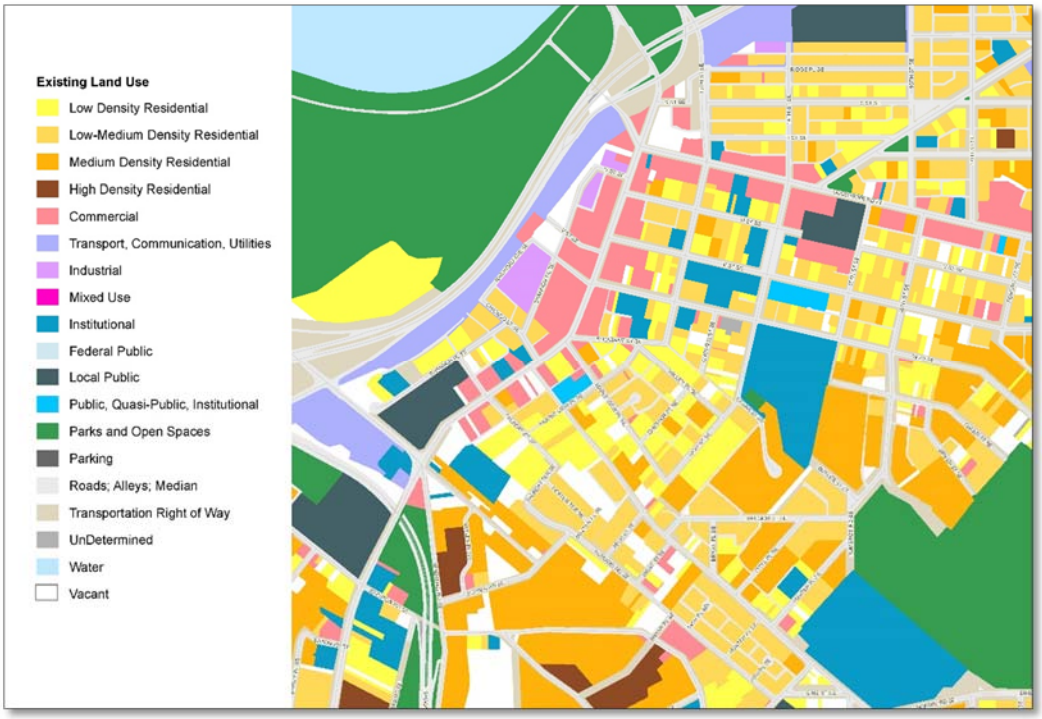

Figure 2 - Anacostia Land Use Map[82]

[81] "Silver Spring, Maryland." *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014.
[82] "Existing Land Use Map." The District of Columbia Office of Planning. 2006. Web. 20 March 2014.

The site in Anacostia is currently a large, paved parking lot. The District of Columbia's existing land use map indicates that this site and land adjacent to it is designated for commercial use. MLK Jr. Avenue bisects this commercial zone, which is located at the western edge of the Anacostia Historic District. East of MLK Jr. Avenue there are a few institutional buildings surrounded by low-density residential and a few medium-density residential zones. There are only a few high-density residential zones scattered around the site and they are mostly located south of the Metro station, far from the business district and the majority of the institutional buildings. The Anacostia Historic District is cut off from the Anacostia waterfront by I-295. The space between the highway and the waterfront is occupied by a portion of Anacostia Park, which is managed by the National Park Service. I-295 to the north as well as Suitland Parkway to the west are busy roadways are significant barriers because there is little porosity through them, physically isolating the Anacostia neighborhoods from the waterfront and downtown DC.

Figure 3 – Anacostia Figure Ground Diagram with potential sites outlined

Density is one of the most visible differentiating factors between the Silver Spring and the Anacostia sites. The population density of Silver Spring is 7,584 people per square mile[83] whereas it is 5,904 in Anacostia.[84] Anacostia is less dense and less developed, especially next to the Metro station. The difference in the density of buildings is visible when comparing the two figure ground diagrams. The largest open, green space is the Frederick Douglass National Historic site. Despite its historic significance, the site is uninviting due to the high wall and fence surrounding it. There appears to be no other space in the area that acts as a town square.

Early in the site selection three options were explored for this project in the vicinity of the Anacostia Metro. The first option was to build on top of the Metro station itself. Since one of the most important criteria was proximity to metro and this space was not yet developed, it was a logical option.

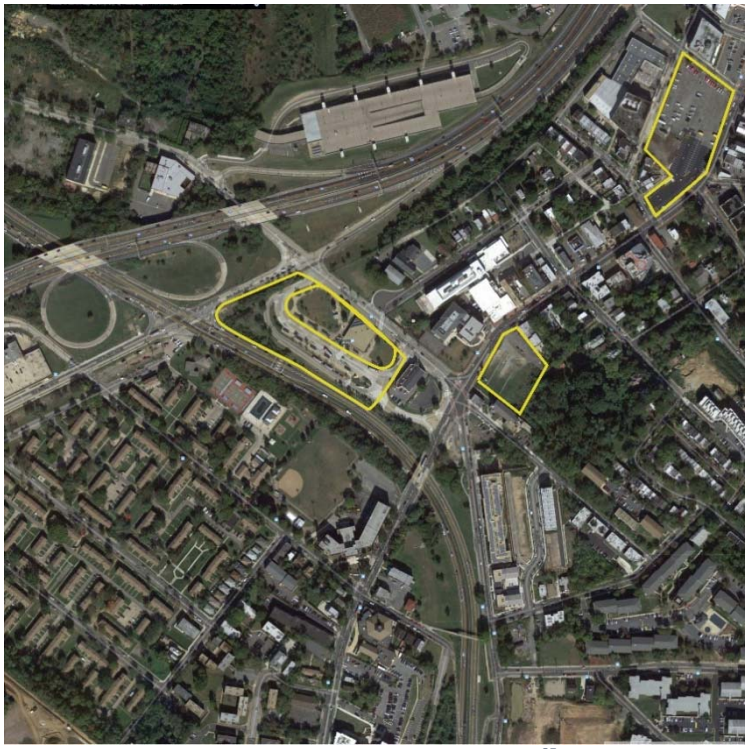

Figure 4- Anacostia site options[85]

[83] "Silver Spring, Maryland." *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014.
[84] "Anacostia Neighborhood." *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014.
[85] "Washington, DC." Map. Google Maps. Google, 20 March 2014. Web. 20 March 2014.

The second is a small parcel of unpaved land that is used for parking and is located one block east of the station. The third option is the large empty parking lot at intersection of MLK Jr. Avenue and W Street SE and within a quarter mile radius of the Metro station. The famous “Big Chair” is located one block north of this location. The third site was selected because of the opportunity to create a public square as part of the redevelopment project. One of the criteria included in the framework for this thesis relates to access to public urban space. This is vital not just for access to light and air but also as a means to promote cultural and social exchange which helps create a healthier and safer community.

I visited the site on March 21 and took several photographs of the neighborhood and the three site options. The Metro station was noticeably busy. Many people passing through the station seem to be or going to or coming from the direction of the center of Anacostia. This is a busy hub because of the Metro buses that service the community and connect it downtown Washington. Busses were constantly moving in and out of the loading areas. Several Metro Police vehicles were present and several police officers monitored the area. The police have a small, permanent observation post on the site. Southeast Washington has a reputation for high crime rate which was made clear by the police presence.

Figure 5 - Site Option 1 - Above Anacostia Metro Stop

Figure 6- Site Option 2 - Dirt lot

Figure 7- Parking lot at MLK Jr. Ave and W St SE

Demographic and Market Data: Anacostia relative to the rest of the District

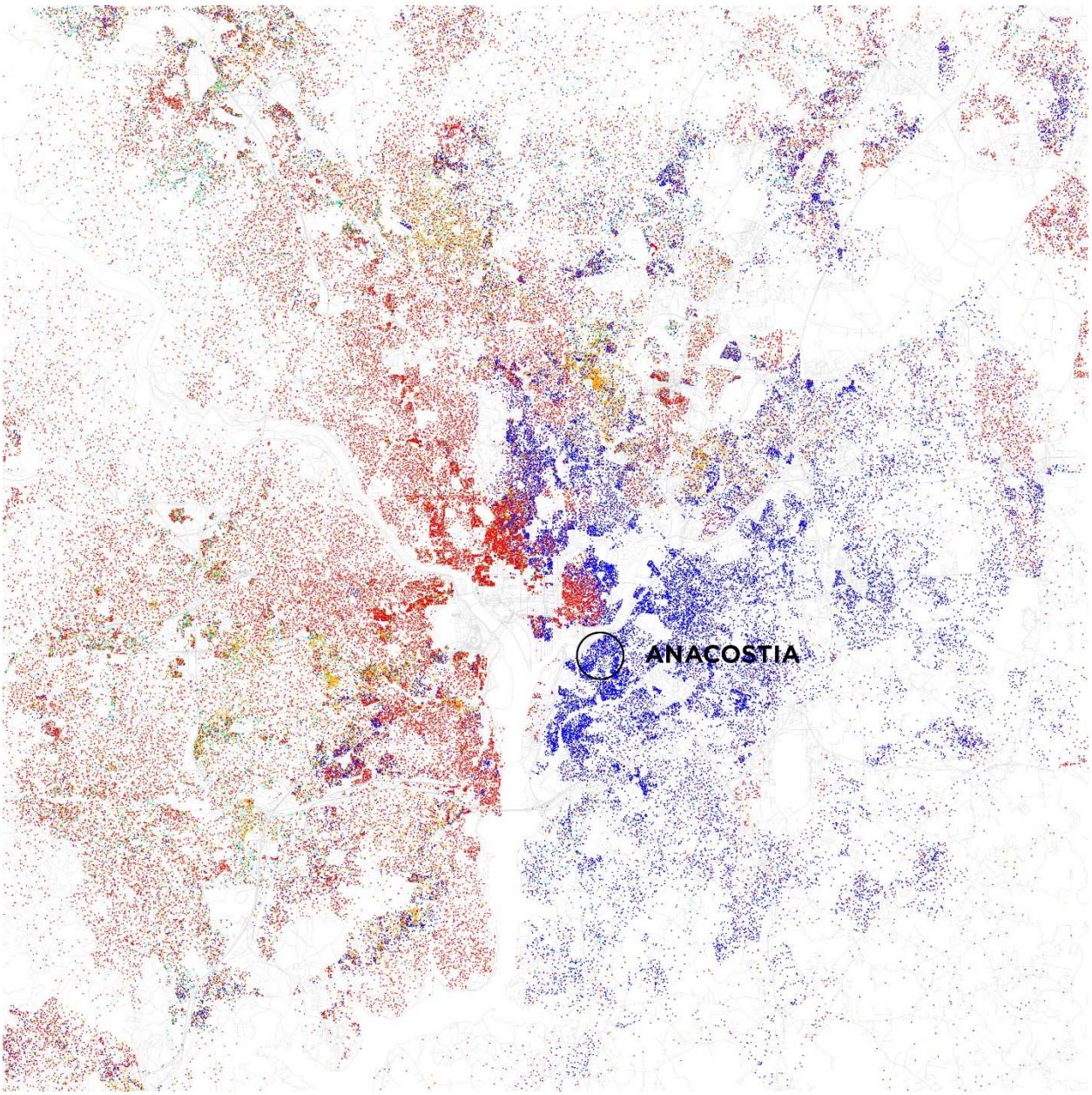

Figure 8 – Racial segregation in the DC area..[86]

[86]Fischer, Eric. "Race and ethnicity: Washington, DC." *Flickr*. 11 Sep 2010. Web. 16 May 2014.

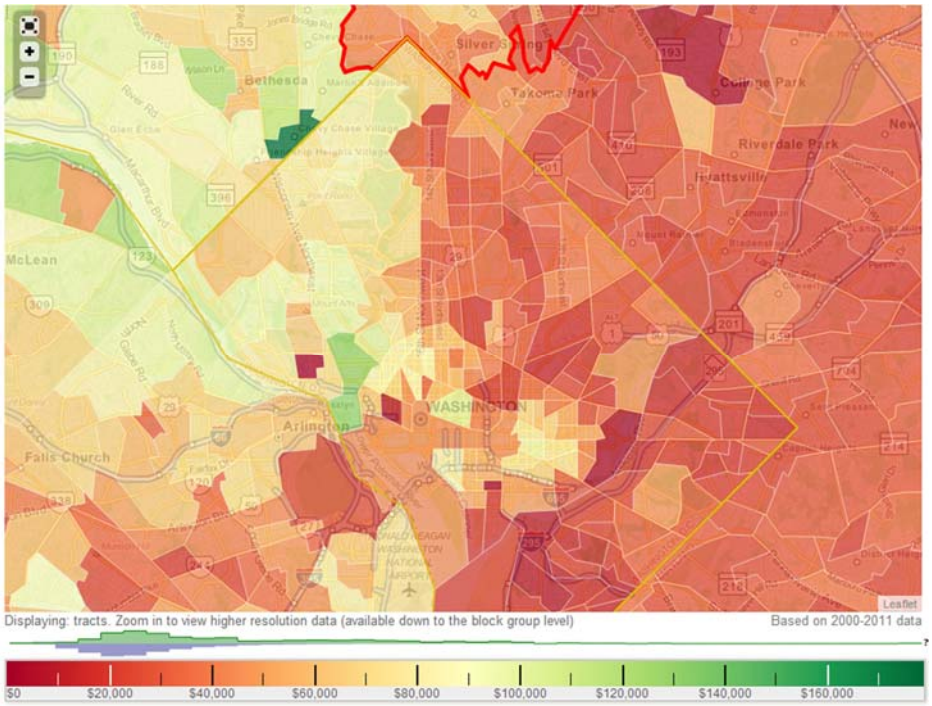

Figure 9- Median per capita income[87]

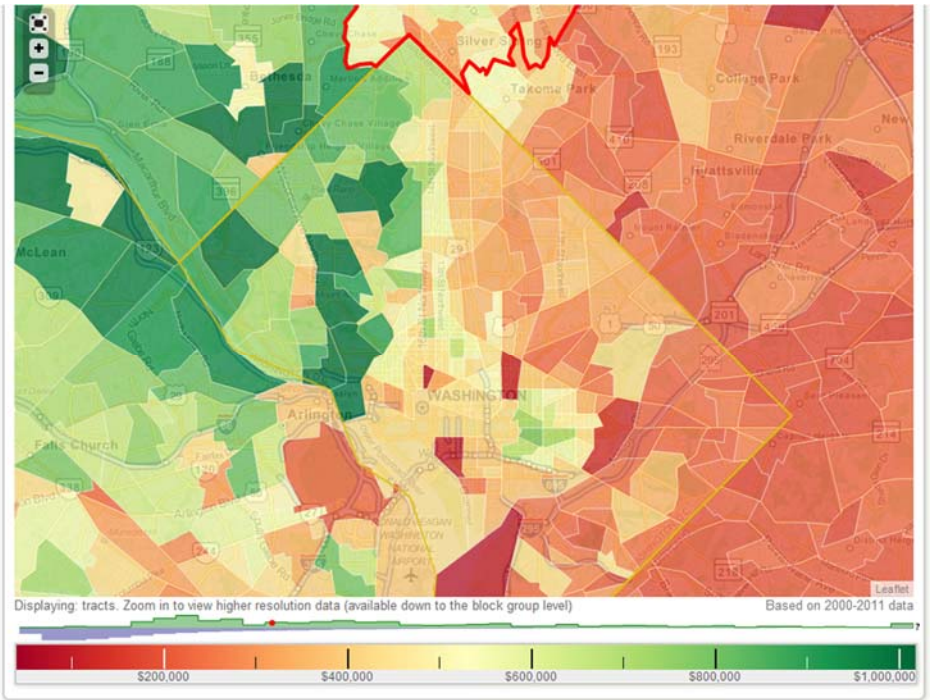

Figure 10 - Home or condo value[88]

[87] "Washington, DC." Median per capita Income; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

[88] "Washington, DC." Home or condo value; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

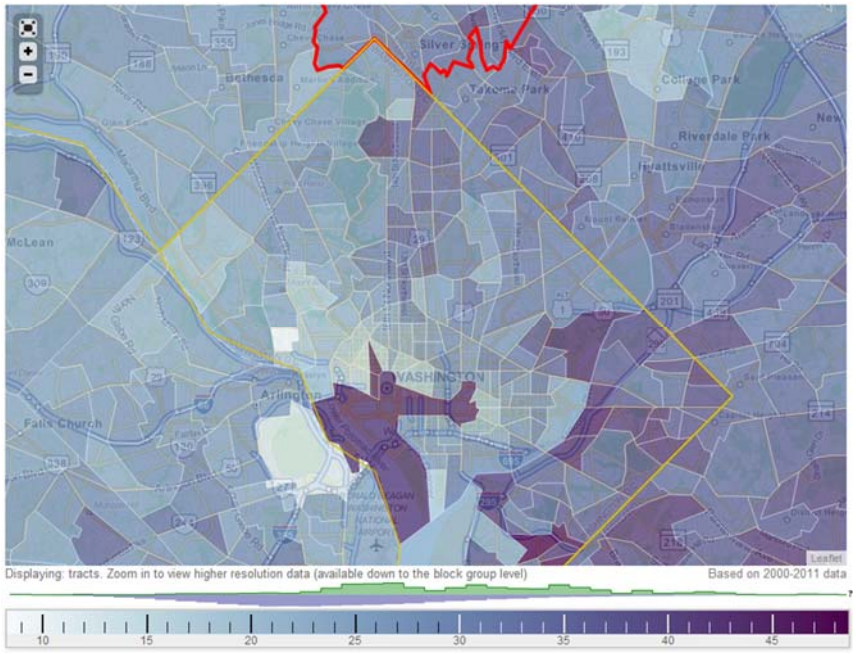

Figure 11 – Commute – Mean travel time to work[89]

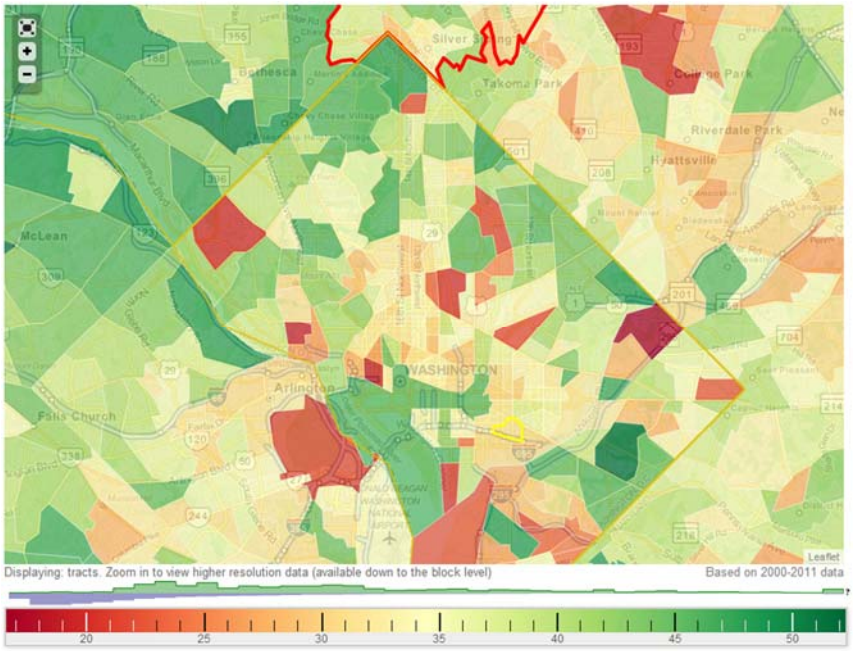

Figure 12 - Median resident age[90]

[89] "Washington, DC." Commute—Mean travel time to work; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

[90] "Washington, DC." Commute—median resident age; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

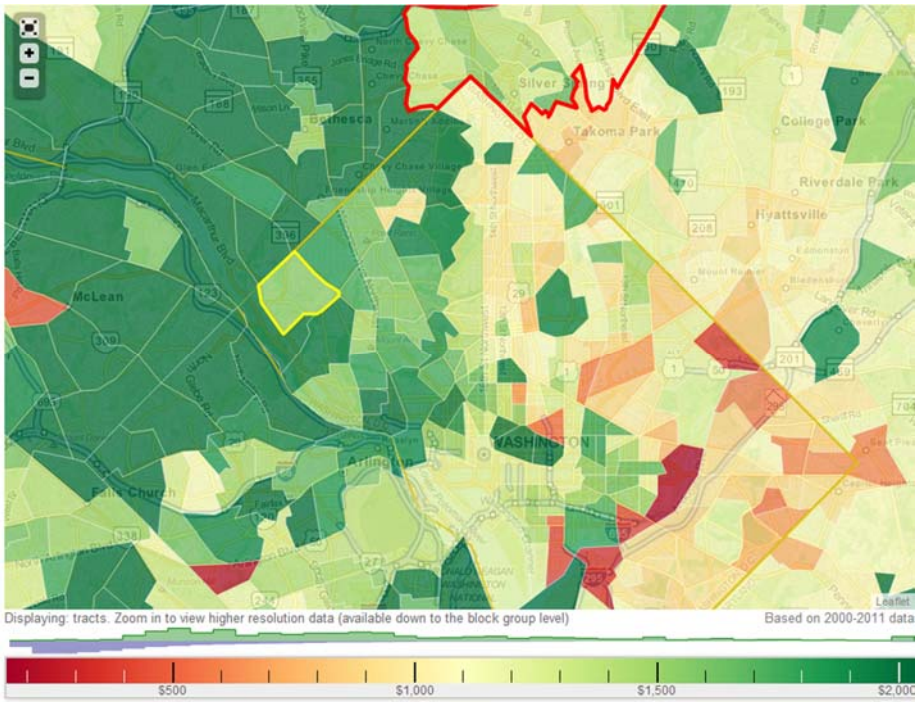

Figure 13 - Median Gross Rent[91]

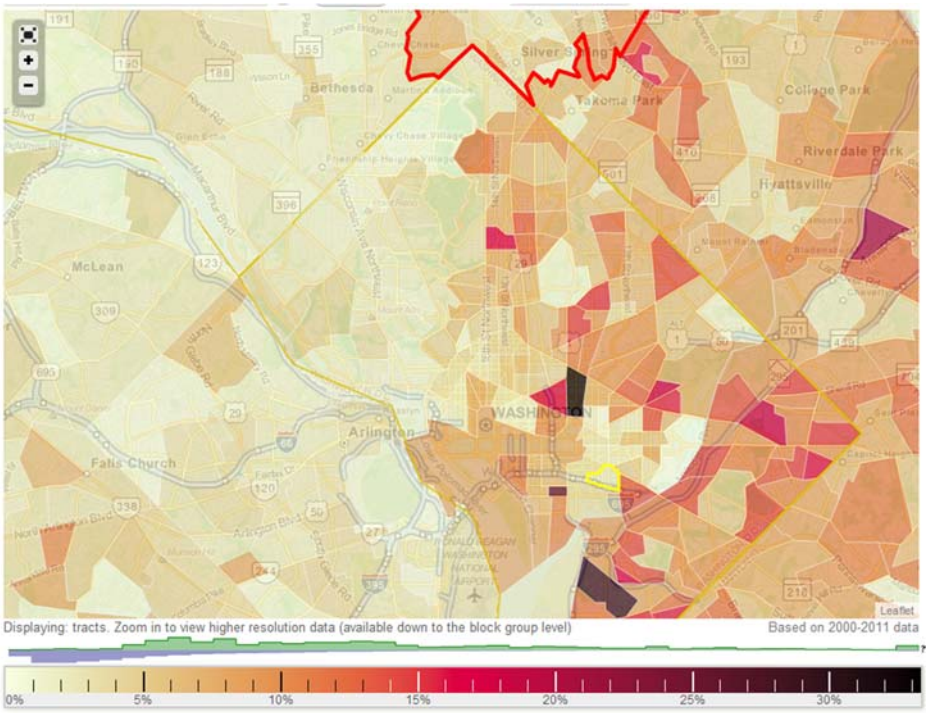

Figure 14- Unemployment Rate[92]

[91] "Washington, DC." Median Gross Rent; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

[92] "Washington, DC." Unemployment Rate; *City-Data.com*. Generated by Xavier Hickerson; using City-Data. 16 May 2014

Figures 8 through 14 illustrate graphically the differences between Anacostia and the rest of the District of Columbia. Those of us who are familiar with the DC area will not be surprised by unemployment statistics, property value, or cost of rent. However, there are a couple of intriguing findings in the commute and median resident age maps, respectively. Residents of southeast Washington seem to have especially long commute times. This can have numerous social implications such as childcare—— particularly in the context of single parent households where long commutes result in increased childcare costs and reduction in the time that parents are able to spend with their children and engage in community activities. One corollary to this finding is that improving the social conditions requires not only improvements in access to transit for residential areas, but also an increase in opportunities for employment closer the community. Connecting residents to jobs will require analyzing what jobs residents are commuting to, and whether their skills could transfer to new jobs located within the community if the wage or salary was competitive and the jobs became available.

As demonstrated in Figure 11, there is a stark contrast in the level of racial diversity of cities such as Silver Spring, Maryland in comparison to predominantly African American neighborhoods in southeast Washington or Prince Georges County, or neighborhoods in Arlington, which are almost all White. One of the criticisms of transit-oriented development is that it can have an adverse effect on social equity because it raises the value of the land around major transit hubs, often forcing working class and poor residents to move. In this context where transit-oriented development is closely associated with process of gentrification, the skepticism of community leaders and residents of neighborhoods like Anacostia is clearly understandable.

Program

The program is primarily housing with the possibility of including income-generating spaces such as live/work units. Since the building will either on or next to Anacostia's main commercial avenue there will likely be ground floor retail and other commercial spaces that will define the mixed use of the building. There are two reasons why income-generating spaces will be included in this affordable housing project. First, a community cannot bring itself out of poverty without proper employment and the proper skills to obtain higher-wage jobs. Second, proximity to a Metro station or transit hub is convenient, but loses some of its advantages if the commute is too long and too expensive even for public transit. In other words, people should live close to where they work and vice versa. Proper, affordable housing and affordable workplaces could create local employment opportunities and services in addition to sorely-needed tax revenue to finance further development of the community. The ratio of residential to work spaces will depend on a further investigation of the demand for each type of space which will likely come from meeting with members of the community and local developers.

The inclusion of live/work units is one way enable residents to make a living but live/work units tend to be associated with artists. Advances in small-scale fabrication and changes in the design and meaning of the "workplace" have provided an opportunity to rethink the relationship between how and where we live and work. Some would say that we have entered a new industrial revolution with the rise of the "maker" culture.[93] This includes anything from light manufacturing that takes advantage of new advances in robotics and 3D printing to more traditional crafts. The argument is that the internet connectivity, combined with new, cheaper methods of fabrication and fast prototyping has created a new paradigm where entrepreneurship

[93] Anderson, Chris. *Makers*. New York: Crown Business, 2012. Print. p. 141.

is easier than it has ever been. Spaces for design and fabrication can be smaller and more affordable. Transactions are made online so the business is global from day one.[94]

Standard office spaces have been evolving over the last decade. Companies are rethinking what their employees need to be happy and productive so that they can retain their best employees and attract next generation of brilliant professionals. Even the federal government, via GSA has initiated programs such as Workplace 20/20 which sought to refresh the federal workplace and the image of government business. The participation of the federal government could be crucial. Even if there is no demand for office in the private sector, the federal government should always be considered as far as lease acquisitions are concerned, especially in the DC metro area. The federal government was one of the first to occupy a significant amount of leased space in the area around the Nationals Park baseball stadium which helped increase confidence in that market. Even the move of one or two small federal commissions or agencies can act as a catalyst in a newly developing market where the risk is too high for a private developer.

Washington, DC has the second-highest cost of rent in the country behind Hawaii.[95] In part this is attributed to low vacancy rates, which average roughly 3.8 percent compared to the national average of 5.8 percent.[96] Even though Washington requires that a certain percentage of units in housing development be below market rate, supply is still lagging far behind the demand. Greater diversity of income within a single apartment building is a housing strategy that should be more common if we truly believe that mixed income communities are better for society as a whole. Building 100 percent affordable housing in an impoverished community may

[94] Ibid. p. 104.
[95] Peterson, Hayley. "D.C. rents are one of nation's highest." *Washington Examiner*. 23 June 2012. Web. 17 May 2014.
[96] Ibid.

increase the standard of living of a few residents, but it may be better either to include a high percentage of market rate units as part of strategy to bring economic development to the community either to provide that affordable housing in a different wealthier community altogether. Each of these strategies has its own problems, but knowing what the best approach is depends on the community in question.

Housing, employment, and retail are important but the real jewel and cultural, social center of Anacostia could be the creation of a public square. As discussed earlier, a public open space has more to do than just access to light and air. There are small parks, playgrounds, and plenty of “leftover spaces” in Anacostia but they do not have the same function as a public square. A public square is a place to gather, to entertain, to express oneself individually or collectively, to see and to be seen. Furthermore, the design of this public square will affect the nature of the cultural, social, and economic exchange that can occur there, so it is not enough to simply have a space. Public spaces change over time according to the needs and circumstances of the community; they can grow or shrink and the “program” or use can evolve. However as designers we should attempt to set a path for the development of that space and treat is an important public amenity.

Structure and environmental systems

A cross-laminated timber structural (CLT) system will be used because of the advantages it has over reinforced concrete traditional wood framing. Wood is arguably the most sustainable structural material when it is sourced from responsibly-managed forests in addition or forests destroyed by pests like the Mountain Pine Beetle in Colorado.[97] Wood is a natural carbon sink and performs better than concrete or steel in terms of embodied energy, air and water pollution, and global warming potential.[98] While the shell cost of cross-laminated timber is cost competitive with reinforced concrete, it is more far more expensive than traditional wood frame construction. This is due in part to the fact that CLT is relative new in the United States. Building codes are being updated to reflect CLT's natural fire resistance and ability to withstand earthquakes. Architects and engineers also need to become familiar and comfortable with designing with CLT panels. Cost is expected to drop once CLT becomes more mainstream. In the meantime, CLT can save money because it has a quicker construction time relative to traditional methods cutting construction time almost in half.[99]

These panels are prefabricated, which has its own set of advantages. Cut-outs for doors, windows, and even wiring can be done in the shop, where indoor fabrication makes it possible achieve a higher quality than what would be possible on site. Panel fabrication and on-site construction requires less professional laborers and the working conditions are safer.

In addition to CLT's advantages as a sustainable material, it is a construction method that produce virtually airtight spaces and therefore makes heating and cooling more efficient. Airtightness is one of the criteria of the Passive House energy efficiency standard, a standard

[97] Alter, Lloyd. "Interlocking Cross Laminated Timber Could Use Up Square Miles of Beetle-Killed Lumber, and Look Gorgeous, Too." *Treehugger*. 29 Nov 2011. Web. 11 Nov 2014
[98] Miller, Gordon. "Cross-laminated timber: the sky's the limit." *The Guardian*. 13 Jan 2012. Web. 13 Nov 2014.
[99] Ibid.

which is one of the most rigorous standards that exists, claiming to cut energy consumption by "60-80 percent compared to code buildings."[100] The environmental systems used in this project will also be derived from the Passive House standard. The units will used a heat recovery ventilator (HRV) which brings in fresh air to bedrooms and living areas and exhausts stale air from kitchen and bathrooms. While this system can vary to respond to local climate conditions such as high humidity, the idea is that all of the building's ventilated air is fresh, not recycled.

Sustainability

The use of cross-laminated timber and the Passive House standard are the primary strategies for environmental responsibility. The application highly-efficient standard such as Passive House can result in a net-zero energy building with the help of photo-voltaic panels and solar thermal collectors to produce renewable energy and hot water, respectively.

Rain water will be harvested from the rooftops and collected cisterns located under the public square that sits in between the two buildings. The filtered water will then be able to be used as grey water in the building and for watering the crops in the greenhouses as well as the gardens of the residential courtyards. Fresh water is quickly becoming a non-renewable resource due to pollution and increased salinization. According to the Natural Resources Defense Council, approximately one third of U.S. counties in the lower 48 states will experience a high risk of water shortages by the middle of the twenty-first century. Therefore, water security and water efficiency must become a serious area of discussion in architecture.

[100] *Passive House Institute US*. Passive House Alliance. Web. 11 Nov 2014. <PHIUS.org>

Precedent Analysis

The following precedent analysis has been broken down into three parts. The first part includes three case studies at the scale of a community rather than an individual building. Two of these projects were funded in part by HOPE VI grants. These case studies were selected because they illustrate the various challenges of transforming a poor community into a one that is socioeconomically healthier and more diverse. One of these cases studies is a rural project, but it is useful because it demonstrates active involvement of the community in the project and ultimately determining their own fate.

The second group of precedents are social/affordable housing projects that are similar in size to the building that will be designed for this thesis, although the size and scope of the buildings in this sampling of precedents vary somewhat. The analysis of these precedents begins to create the analytical framework through which basic metrics of the social performance of a building are created. Although all of the buildings in this group are social housing projects, some include other noteworthy programs such as social services or retail.

The third group of precedents are office and other workplace environments. The word "workplace" will often be used in place of "office" because office connotes a particular type of work environment that is too limiting. The General Services Administration has conducted some research into modern work environment in the last decade, so federal workspaces will be included in the discussion of workplace precedents. Additional precedents will come from European workplace design practices where rules about access to light and air for workers in buildings are more rigorous and regulated than in the U.S.

Group 1: Community Case studies

Case Study 1: Bayview Rural Village

Dates: 1997-2003

Design Firm/Architect: RBGC Architecture, Research and Urbanism

Lead Designer: Maurice D. Cox

Organizations or Partners: The Nature Conservancy

Units: 32 low-income rental units.

Bayview is a rural village on the Eastern Shore of Virginia. It is a historically black community that was transformed thanks to a combination of hard work by the community and the involvement of an architect. The story begins in 1994 when Maurice Cox was approached at a community design workshop in Cape Charles, Virginia by Alice Coles, a resident of Bayview.[101] Cox, who would become the lead designer, described it as a situation of being in the right place at the right time.[102]

The village itself was crumbling and in desperate need of help in order to save itself. The situation was dire. Of the 52 homes in the village, only six had toilets and most did not have indoor plumbing.[103] The shacks that people called home were deteriorating and unsafe. "The physical blight was compromising every aspect of their community's health—their physical health, their mental health, their economic health. The physical decay of the place was bearing down on their ability to be a healthy community."[104] Because one of the serious issues had to do with water safety, one of the partners of the community and member of the Nature Conservancy found a grant for $20,000 from the EPA to combat issues of environmental justice.[105]

[101] Architecture for Humanity. *Design Like You Give a Damn.* New York: Metropolis Books, 2006. Print.p. 157.
[102] Ibid.
[103] Ibid.
[104] Ibid.
[105] Ibid.

From there the residents of Bayview got organized, met regularly with the design team, and they found additional funding. It was necessary to have an organizational structure in place before a single drawing was made. While the goal of the project was to create a healthy community, the residents also made it clear that they wanted affordable housing without the stigma attached. A balance between beauty and affordability has to be found. Ultimately, the project was successful because the community was deeply involved in the process, taking ownership of the project, and because of the design thinking that the architect brought to the table. The key to getting the ball rolling was making the connection between design and social activism. “If designers are not in the community, then those who might potentially need our talents the most simple might not find us,”[106] Cox explained.

[106] Ibid. p. 159.

Case Study 2: New Holly, Seattle

Dates: 1993-2005

Design Firm/Architect: Weinstein A/U Architects + Urban Design

Lead Designer: Edward Weinstein

Organizations or Partners: Seattle Housing Authority, Department of Housing and Urban Development

Units: 1,414 residences on 118 acres.

New Holly was once known as Holly Park, an ad hoc community that came about due to a need for temporary housing for shipyard workers during World War II.[107] By the 1990s the majority of the residents were immigrants from various regions of East Asia. At least seven languages were spoken. The community was cut off from the urban fabric by a high voltage transmission line to the east, a major east-west arterial road to the south and winding interior roads that ended in cul-de-sacs. It was the poorest neighborhood in Seattle, a "choice of last resort."[108] The residents were physically, linguistically, and economically isolated.

The Seattle Housing Authority (SHA) sought funding to develop the area and eventually won $48 million in HOPE VI grants. Because the existing building had to be demolished, the phases of the project had to account for resident displacement with the option given to the residents to return to new units or take rental assistance vouchers.[109] About half of the residents decided to move away from New Holly permanently.[110] Unlike the Bayview project, the community was involved but it was not leading or managing the project. The SHA took

[107] Engdahl, Lora. "New Holly, Seattle." *From Despair to Hope*. Henry G. Cisneros and Lora Engdahl. Ed. Washington: Brookings Institution Press, 2009. Print. p. 93.
[108] Ibid.
[109] Ibid.
[110] Ibid. p. 100.

responsibility for keeping the project moving forward with the assistance of a private local developer.

Architect Edward Weinstein and his firm used a “kit of parts” strategy in designing three and four-bedroom homes.[111] This way the houses looked similar and had similar floor plans without being identical. To address the stigma attached to affordable homes, the architects consciously made the decision to make the for-sale homes indistinguishable from the subsidized rental homes.[112] The community has a wide range of incomes and while issues of class and linguistic or cultural isolation have not disappeared, it is a vast improvement over what existed before.

The streets were reconfigured, reconnected the grid of the surrounding city and physical obstacles such as the high-voltage power lines were relocated, and in addition, the city planned light rail station, around which a commercial district would slowly begin to develop.[113]

[111] Ibid. p. 102.
[112] Ibid. p. 103.
[113] Ibid.

Case Study 3: The Villages of Park DuValle, Louisville, Kentucky

Dates: 1996-2003

Design Firm/Architect: Louisville Real Estate Development Company, Urban Design Associates

Organizations or Partners: Housing Authority of Louisville, Department of Housing and Urban Development

Units: 613 renter households, 345 homeowner households.

Park DuValle was an impoverished African American neighborhood in Louisville's West End in 1994 when the city's mayor and the Housing Authority of Louisville began looking grants to fund its redevelopment.[114] Similar to New Holly, the majority of the buildings would be demolished and a comprehensive design would create new public space, mixed-income housing, and reconnect neighborhood to the surrounding area by investing in new infrastructure. In order to decrease the concentration of poverty, some of the replacement housing had to be built elsewhere in the city.[115] The economic strategy hinged on getting higher-income buyers to invest in the neighborhood and buy the first new homes.[116] The housing authority and its development partners were successful in creating that new market that served as a catalyst for completing the rest of the project.

The community was not deeply involved. It was the housing authority that took the initiative. Urban Design Associates was a firm based in Pittsburgh hired to design the master plan.[117] It seems the community's involvement was limited to choosing which architectural styles they favored, ultimately settling on a mix of Victorian, Arts and Crafts, and Colonial styles

[114] Ibid. p. 123.
[115] Ibid. p. 125.
[116] Ibid. p. 126.
[117] Ibid. p. 126.

that was typical of the area.[118] The author of this case study cites it as an example of how new urbanist-style housing can transform a blighted neighborhood into a healthy one.

While the residential portion of the project was successful, Park DuValle was never able to develop a vibrant commercial center. Secondly, the neighborhood does have a mix of families of varying incomes; most of the former residents went to other public housing sites. It is not clear how or why that happened, but part of the reason is due to the rules that communities create in these cases as a condition for returning.[119] Employment or the active search for employment is one of the criteria shared by Park DuValle and New Holly.

[118] Ibid.
[119] Ibid. p. 135.

Group 2: Social Housing Precedent Analysis

Project 1

Architect/Firm: Michael Pyatok

Project: Devine Legacy

Location: Phoenix, Arizona

Completed: 2012

Notes:

This is a transit-oriented development for a non-profit organization called Native American Connections. The building is rated LEED Platinum and contains 65 units. The ground floor space facing the main street is reserved for social services. The ground floor has three-bedroom units that connect to the courtyard. Above the ground units are two-story homes with two or three bedrooms. The top floor has double height units, single bedroom or studios. The project came out of a need to address the problem of alcoholism and other problems that were affecting Native American youth and families. A non-profit organization reached out to a developer and architect for a design that mitigates these issues.

Initial observations:

One of the most common strategies that Pyatok uses to get the most efficient use of the site is to arrange particular unit types in such a way that he is not required to have fire stairs, elevators, or corridors. Ground floors are typically flats with one to three bedrooms depending on the project and the site and then stacked townhouses on top of that. Fifty-five units per acre is the threshold at which fire stairs, elevators, and double-loaded corridors are required in his projects.

As a result of this strategy, the architect gets as much density as possible out of low-rise buildings.

Units are typically organized around a courtyard such as in the example of Devine Legacy. The organizational strategy for housing underprivileged people seems to work really well, which is why Pyatok repeats it often and has won many awards. However, while one would expect social housing to be developed with a small budget, the problem is that it clearly looks like a cheap building, both on the interior and the exterior. The project is located in Phoenix, so the southwestern color palette is appropriate; however, the composition looks like a caricature of pueblo architecture rather than a contemporary, regional building.

Project 2

Architect/Firm: Michael Pyatok

Project: Fox Courts

Location: Oakland, CA

Completed: 2009

Notes:

The building contains 80 units for a total of 134,000 sf. There are 4,800 sf of commercial space including space for a childcare facility and arts-oriented retail. It is adjacent to historic Fox Theater. Awards won include: 2010 Acterra Award for Sustainable Development and the 2010 Green Communities Award

Initial observations:

Like Devine Legacy, the units are arranged around a central, secured courtyard (this has two courtyards) and townhouses make up most of the elevations. It is located in an area that was completely redeveloped with new low-rise apartment buildings. This complex has a small footprint compared to the apartments north of it which look similar architecturally. It's not clear whether those are market rate or affordable.

Aesthetically, it is more successful than Devine Legacy. The firm's nod to the arts district is in its inclusion of two small murals/paintings high up on a wall of one of the buildings. The inclusion of art-related retail seems like a good idea if is to bring back the neighborhood as an arts district that would get a lot of visitors.

Project 3

Architect/Firm: Elemental

Project: Quinta Monroy

Location: Iquique, Chile

Completed: 2004

Notes:

The main construction materials are concrete and concrete block.[120] The objective of the project was to house 100 families who had been living on the site illegally for 30 years. About 57,000 square feet of built space was required but funding was limited to building out 30 square meters. ELEMENTAL's solution was to build a simple structure and shell that could be built on and expand over time. The idea was that rather than delivering a finished product whose value decreased over time, a house that is incrementally built, adjusted to the needs of the occupant, is something that is invested in and thus increases its value and empowers the user.

Initial observations:

Without having done any extensive research on incremental housing, my sense is that this is not a good long term solution. ELEMENTAL was successful given their extremely limited budget and the circumstances of the site, which unfortunately is probably not unique. My three main objections or concerns have to do with a) the money that is invested in the house that could be used for needs (e.g. food, clothing, medicine, personal savings, education, etc), b) the aesthetic quality and architectural cohesion of the community, and c) the ambiguity of ownership and responsibility over shared semi-public, semi-private space.

[120] "Quinta Monroy / ELEMENTAL" 31 Dec 2008. ArchDaily. Accessed 18 May 2014. <http://www.archdaily.com/?p=10775>

There's no question this redeveloped site is better than what it replaced, and that this has increased their standard of living. The question is, for how long? Can incremental housing succeed in the long term if residents spend more on building their homes than other daily necessities or their design decisions slowly begin to turn the community back into a slum? By some measures it could still be considered a slum, just a more orderly one. Perhaps it is a question not of whether the occupant can expand or not but how much and with what means. How "finished" should a house be before it is turned over to the user? In what other ways can the user be empowered without having to invest in making the building?

Project 4

Architect/Firm: Zigzag Arquitectura

Project: Vivazz Social Housing

Location: Mieres

Completed: 2010

Notes:

There are 192,000 sf of residential space.[121] Corrugated steel covers the outward-facing exterior. A double skin inward-facing exterior of large windows and movable wooden shutters make up the rest of the skin.[122] The heights vary from three to seven stories. There is a radiant floor system and solar panels collect energy to produce hot water.[123]

Initial observations:

The contrast between interior and exterior is intriguing. The steel exterior reflects the industrial history of the region while the wood interior is a reference to the wooded rural areas surrounding the city. The double skin with the wooden shutters might be good for privacy and controlling heat gain, but from the perspectives it feels as though the buildings are disconnected from the courtyard even though the ground units have direct access to it. Perhaps the shutters are more porous than they look as pictured it does not look like a “defensible” space. It does not look

[121] "Vivazz, Mieres Social Housing / Zigzag Arquitectura" 28 Jun 2013. ArchDaily. Accessed 17 May 2014. <http://www.archdaily.com/?p=393277>
[122] Ibid.
[123] Ibid.

like access to the courtyard is restricted, which could be problematic depending on the amount of crime in the neighborhood.

Project 5

Architect/Firm: ADD+ Arquitectura

Project: Social Housing in Granollers

Location: Granollers, Catalunya, Spain

Completed: 2004

Notes:

There are eight three-bedroom units plus a roof terrace and parking. According to the architects, “a main space inside the housing will organize the spaces and will deform the façade creating different kinds of in-between inside-outside spaces.”[124]

Initial observations:

The facade is a playful extension of interior spaces. Similar materials are used to make the connection between indoor and outdoor. The project description doesn’t mention it, but this was probably an infill project to finish the block. It’s the same scale as the neighboring buildings and uses the same typology but in a more creative way (e.g. balconies, roof terrace, underground parking).The core of the building is a set of stairs and an elevator, minimizing corridor space. The core of the unit is the kitchen specifically the island with the sink. The living space is adjacent to it while the bedrooms are located at the corners of the unit. The units at the end of the block have bathrooms with windows, which is nice. This is a relatively small project it seems fairly efficient. It’s not clear though why the units don’t extend all the way back to the back alley or property line.

[124] "Social Housing in Granollers / Bailo Rull ADD+ Arquitectura" 11 Aug 2008. ArchDaily. Accessed 17 May 2014. <http://www.archdaily.com/?p=4966>

Project 6

Architect/Firm: Brooks + Scarpa

Project: Colorado Court

Location: Santa Monica, CA

Completed: 2002

Notes:

There are 30,150 sf of residential space for 44 units (375 sf max per unit).[125] The building has a LEED Gold rating and won the 2003 National AIA Design Award.[126] The building achieves net-zero energy through use of solar panels, natural gas-powered turbine/heat recovery system and passive heating and cooling strategies.[127]

Initial observations:

The fact this is technically a net-zero energy public housing project is the most attractive feature of this project. The architects have diagrams showing how they have considered using the wind and solar orientation to their advantage. The corridors are single loaded so they can get natural cross ventilation. The narrow parts of the building face south and are covered with PV panels protecting the units from direct solar gain.

Despite the awards, this is still a very ugly building, no matter what positive comments the architects says they received from people walking by it.

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[125] "Colorado Court / Brooks + Scarpa" 19 Nov 2010. ArchDaily. Accessed 18 May 2014. <http://www.archdaily.com/?p=89665>

[126] Ibid.

[127] Ibid.

The cost of the PV panels was said to be recouped in less than ten years but the aesthetic price they paid for simply hanging them from the side of the building is a design decision should not be ignored.

Project 7

Architect/Firm: MDW Architecture

Project: Savonnerie Heymans

Location: Brussels, Belgium

Completed: 2012

Notes:

This is located on the site of a former soap factory.[128] Unit types include 1-6 bedroom apartment, lofts, duplexes, and *maisonette*s and is100% social housing.[129] "Glass enclosed bioclimatic loggias" act as an acoustical and thermal barrier.[130] The complex requires less than 15kw per square meter to heat. Collective heating system for the entire site (cogeneration).[131] Hot water is heated by 60 square meters of solar panels. Rainwater is harvested for toilets.[132] Natural materials are used for insulation. Existing buildings were adaptively reused when possible.[133]

Initial observations:

The designers employed a variety of strategies to make it cheaper to maintain and live in this complex. Reusing existing buildings on the site of an old factory probably also reduced the project cost. The diagrams are playful and clear. They talk about circulation, public space, community space, unit types, and green strategies. Overall it seems like their many project goals were well-integrated and it is has good mix of existing and new architecture. One potential point

[128] "Savonnerie Heymans / MDW Architecture" 27 Mar 2012. ArchDaily. Accessed 17 May 2014. <http://www.archdaily.com/?p=220116>
[129] Ibid.
[130] Ibid.
[131] Ibid.
[132] Ibid.
[133] Ibid.

against the project is that it is 100% affordable, which may not a bad decision depending on the socioeconomic status of the rest of the neighborhood.

Project 8

Architect/Firm: Roldán + Berengué

Project: Social Housing Tower

Of 75 Units in Europa

Location: Barcelona, Catalunya, Spain

Completed: 2010

Notes:

This building is located southwest of downtown Barcelona in an area of the city that has 26 towers.[134] The floor dimension is the maximum allowed which is 82'x82.'[135] The designers explain that they tried to minimize vertigo by introducing intermediate elements such as balconies and lintels.[136] Facade is made of composite aluminum panels.[137]

Initial observations:

From the exterior, the tower is dived into five sections with similar plans. Within each section the there is some difference in arrangement. This is a typical tower with a lot of hardscape around it. The facade has an interesting composition, but it has an overall unpleasant feel.

[134] "Social Housing Tower Of 75 Units In Europa Square / Roldán + Berengué" 25 Apr 2011. ArchDaily. Accessed 18 May 2014. <http://www.archdaily.com/?p=130267>
[135] Ibid.
[136] Ibid.
[137] Ibid.

Project 9

Architect/Firm: Amy Weinstein

Project: Townhomes on Capitol Hill

Location: Washington, DC

Completed: 1999

Notes:

This project cost about $24 million and was paid for with the help of HOPE IV grants at a per-unit cost of $170,068.[138] It includes 153 new, mixed-income houses, 52 one-bedroom units, 95 two bedroom and 6 three-bedroom units.[139] The style of the buildings is Victorian.

Initial observations:

The architect used a familiar building typology and style for each of the townhouses so that they blend into the rest of the neighborhood. It is a good sign if it is difficult to tell that this actually an affordable housing project. Yet while the row house typology fits the existing scale of the area, it limits number of units that can be placed here. Maintaining the character of the neighborhood is good, but perhaps there is a way to get more density here especially since it is relatively close to a Metro station. Eastern Market Metro Station is less than a half mile away.

[138] *A HOPE VI Project in Washington D.C. Draws Inspiration from L'Enfant's Original Plan*. Washington: Growth Management Institute, 2005. PDF.
[139] Ibid.

Precedent Evaluation and Process

Since all of the precedents are social housing projects, the precedent evaluation is intended to study where the precedents succeed or fail to follow desirable architectural practices and are socially-productive. The following section contains the design criteria divided into two thematic categories: architectural evaluation and social evaluation. Each of these contains a series of subcategories described by questions used to evaluate each of the precedents. Each sub-category is intended to contain objective measureable criteria representing qualitative or quantitative data depending on the category.

The results of the evaluations are represented graphically based on a matrix that assigns a numerical value to each item of a subcategory for each precedent studied. Two data sets were constructed with the intention of studying which type of chart would result in the clearest assessment of the precedent. In the first version, the architectural evaluation category contains five subcategories and represented as slices on a pie chart: *sustainability, aesthetics, common space, spatial accommodation, and urban context.* Each precedent is given a total of 100 points to be divided up into these five categories with the most points attributed to the category or categories that building design seems to prioritize. A building does not seem to prioritize any category over another would appear more balanced.

In the second version of the architectural category each of the previously mentioned five sub-categories have three sub-categories of their own. For example, in this second version, the category sustainability contains the following three sub-categories: *energy production, high performance, and sustainable materials.* Up to ten points are assigned to each of these three sub-categories. Points are assigned to categories depending on how well the individual criteria are satisfied, guided by the questions associated with each sub-category. For example, under *sustainability-energy production,* if the building is able to produce 100% of the energy that it

consumes, it receives the full ten points for that sub-category. Precedent buildings that do not produce any energy for consumption would not receive any points under that category. Similarly, for the other categories, less than five points would be a weak score, a rating of five points is deemed acceptable, and a score higher than five indicates success in that category.

Although the two versions of the evaluations have their own purpose and have their own readings, the second version is more useful because it is easier to compare and contrast the categories in and between categories and it helps identify projects that are strong overall. The best projects are those that are able to integrate each of the design criteria into a cohesive, beautiful, and socially productive project.

Evaluation Criteria: Architectural

Sustainability

1. *Energy Production:* Does the building produce electrical power? Does the building produce energy for heating or cooling? Is energy harnessed/produced on site or nearby?
2. *High Performance:* Does the building use high performance criteria such as Passive House to minimize energy usage? (e.g. High performance triple-glazed windows, super-insulation, an airtight building shell, limitation of thermal bridging and balanced energy recovery ventilation). Can the building provide thermal comfort while minimizing the use of "active" environmental systems?
3. *Sustainable Materials:* Are the building materials predominantly environmentally friendly and sustainable? Are they recycled/recyclable? Are they produced in an environmentally-responsible and sustainable way?

Aesthetics (Beauty)

1. *Interior Design:* Is the interior a desirable-looking space? Do the finishes look cheap (like it was designed to take abuse, not to be beautiful)?
2. *Facade/Exterior Design:* Is building exterior attractive? Does it look like a desirable place to live or work or does it look cheap (clearly below market building)?
3. *Relationship of exterior to interior:* How are transition spaces, thresholds, interstitial spaces articulated or celebrated? Is the interior expressed on the exterior (and vice versa)?

Common Space

1. *Circulation:* Is circulation efficient (does it do double duty as common space? Does the building typology lend itself towards a reduced need for corridors? Are stairs and corridors placed in the "right" places?

2. *Outdoor/courtyard*

Is the courtyard proportioned to take advantage of passive cooling/heating effects? Are the open spaces "crafted" or are they leftover spaces? Is there perceivable relationship between indoor and outdoor spaces?

3. *Indoor:* Are interior common spaces inviting? Do indoor common spaces exist? Are they celebrated and visible or are they secluded?

Spatial Accommodation

1. *Adaptability:* Are living/working spaces adaptable to the needs of different people or program? Does the structure or form of the building enable or restrict the reprogramming of space or the ability of the user to express his/her uniqueness or preferences?
2. *Size:* Is the size of the space appropriate to its function but still comfortable and desirable to the user (not too much space, but not too little); (room to think)
3. *Variety:* Is there a sufficient variety of spaces both in terms of the architectural promenade as well as "static" spaces?

Urban Context

1. *Density:* Is the density maximized in a way that is considerate of the existing urban context but also urban growth?
2. *Orientation:* Is the building oriented properly on the site to take advantage of views, lot sizes, etc.? Does the orientation respond to climate conditions?

3. *Access:* Does the building facilitate access to nature, daylighting, or public space when available?

Figure 15 – Architectural Design Evaluation. - Version 2 – Describing the success (many points) or failure (few points) of the project in its respective category

Evaluation Criteria: Social

Community Participation

How was the community involved in the development or execution of the project?

How does the building engage with the community after completion?

How is the community's culture reflected in the design and look of the building?

Defensible Space

Does the building enable civic behavior and discourage suspicious/criminal behavior?

Are the residents encouraged to be "agents in ensuring their security?"[140]

How did the project affect the physical and social fabric of the neighborhood?

Transit and Walkability

Is the building located in a site that is near public transportation?

Does the building (or building management) facilitate or encourage use of public transportation?

Does the project contribute to idea of a walkable urban community?

Does the building have dedicated plug-in stations for electric vehicles?

Socioeconomic plurality

Applied to Housing

Does the building contain a balance of market rate and affordable units?

If the building is 100% affordable, how does it complement the existing neighborhood by creating more plurality or does it concentrate poverty?

Applied to Workplace

Does the building facilitate entrepreneurship or house training programs?

Does the building promote a healthy and safe work environment?

[140] Newman, Oscar. Defensible Space. New York: Macmillan, 1972. Print.

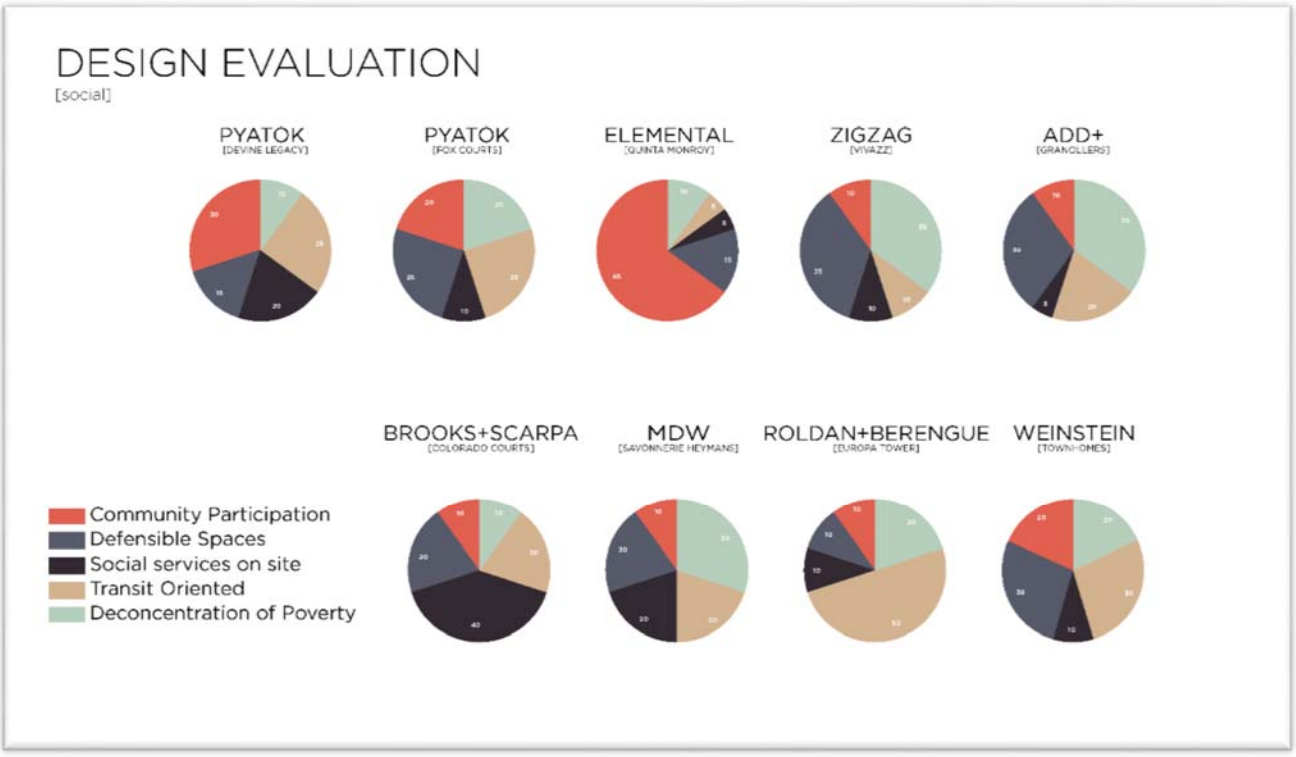

Figure 16 - Social Design Evaluation - Version 1 - Describing overall project priorities and balance

Application of Design Criteria in Affordable Housing Design

The following are diagrams discussing how the design criteria was applied to the design of two affordable housing building that are the culmination of this thesis. Final drawings follow the design diagrams.

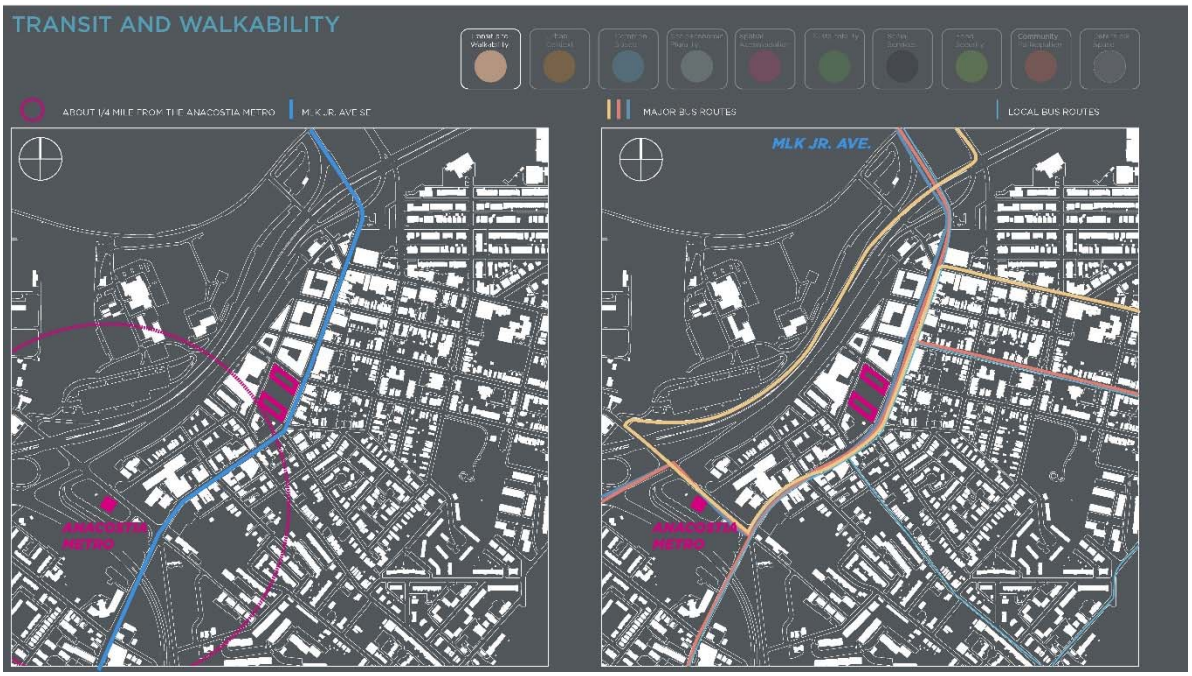

Figure 17 – Transit and Walkability

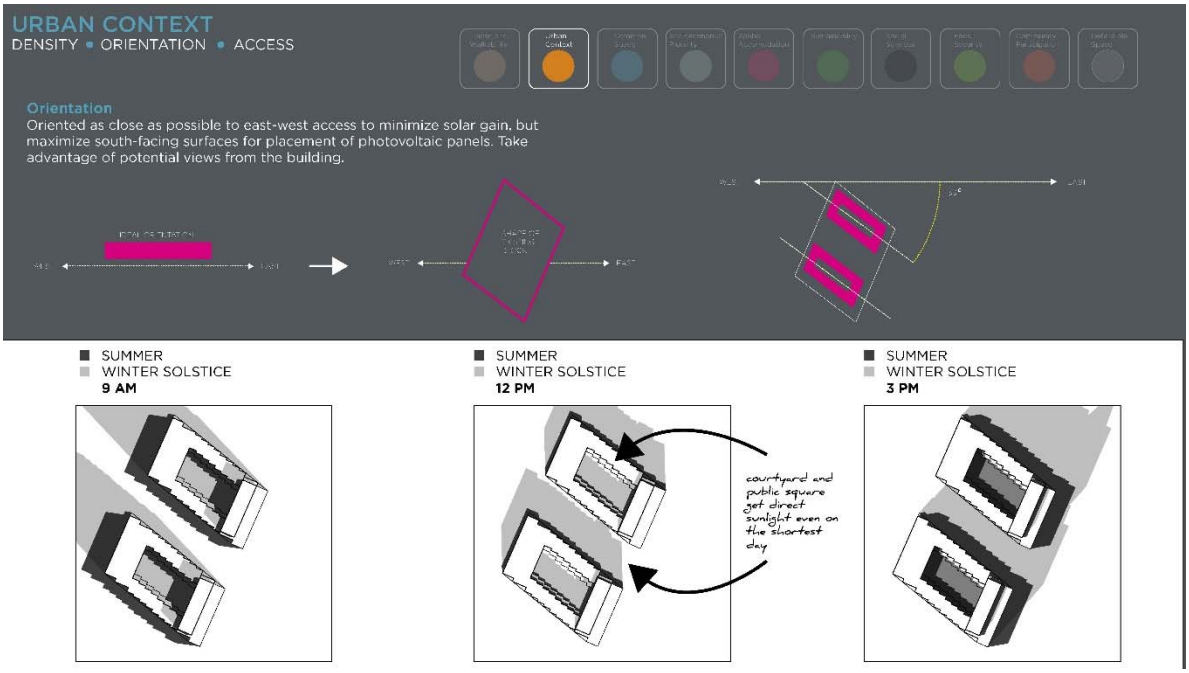

Figure 18 – Urban Context: Orientation

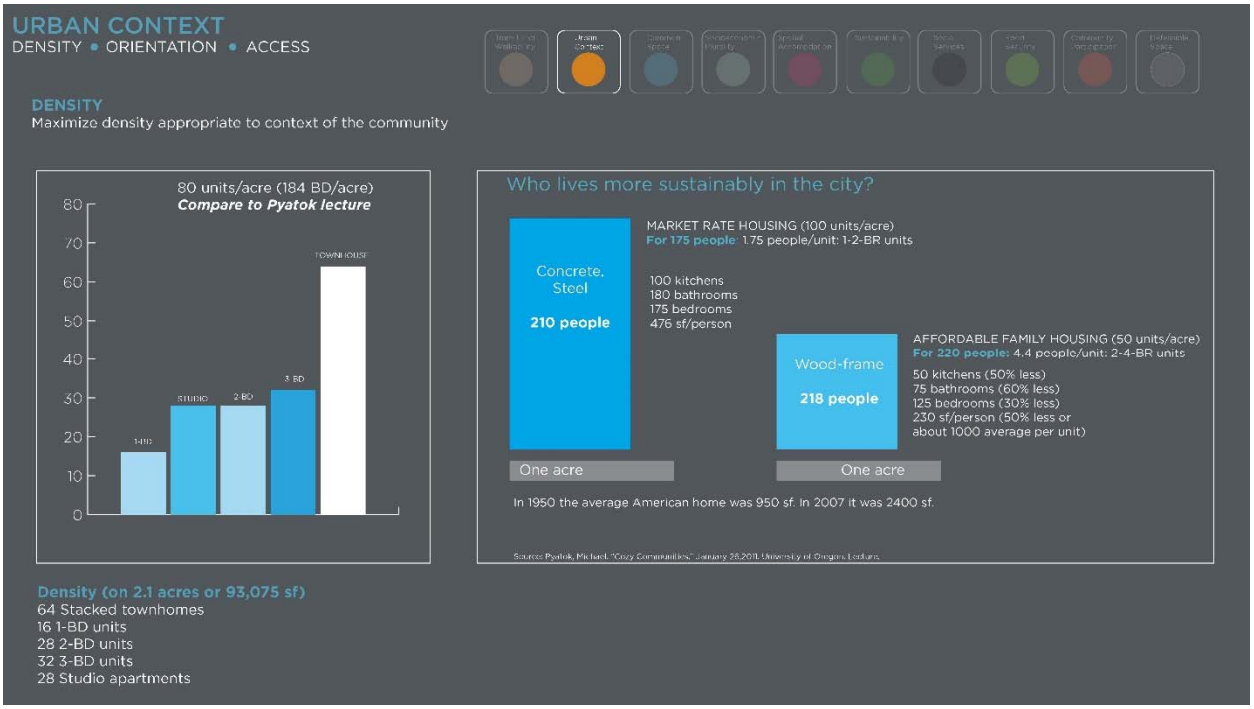

Figure 19 – Urban Context: Density

Figure 20 – Urban Context

Figure 21 – Urban Context: Access

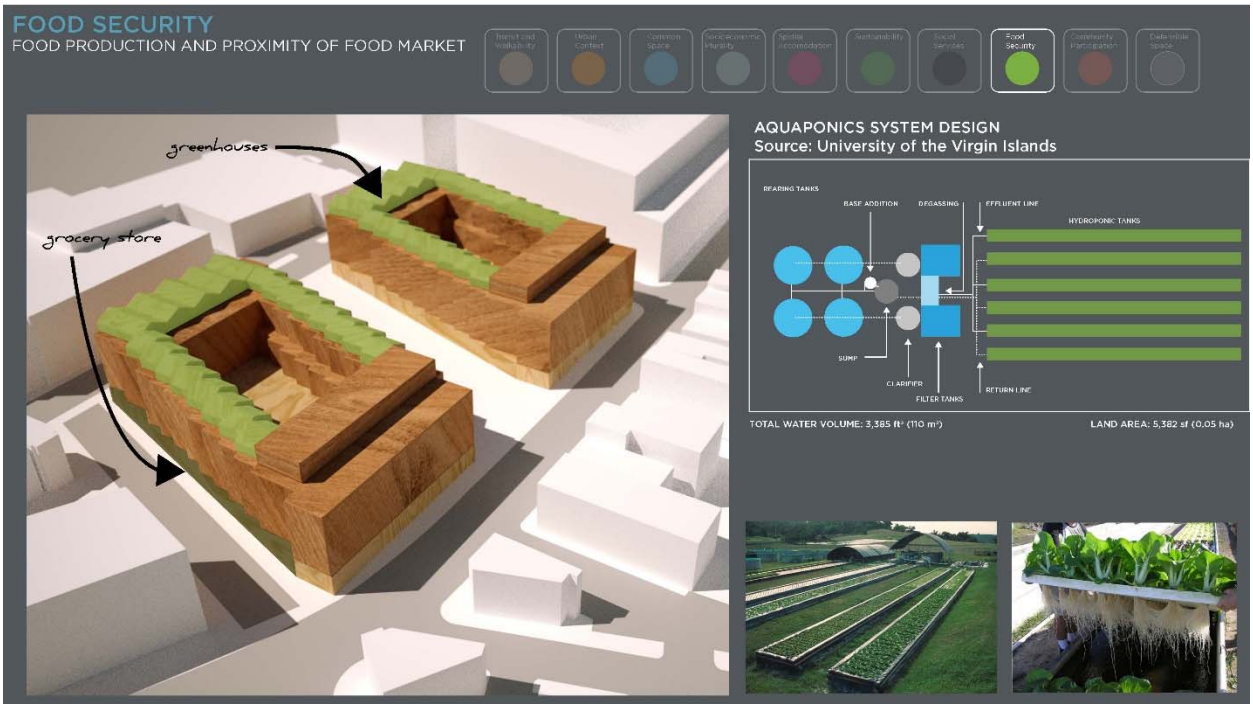

Figure 22 – Food Security

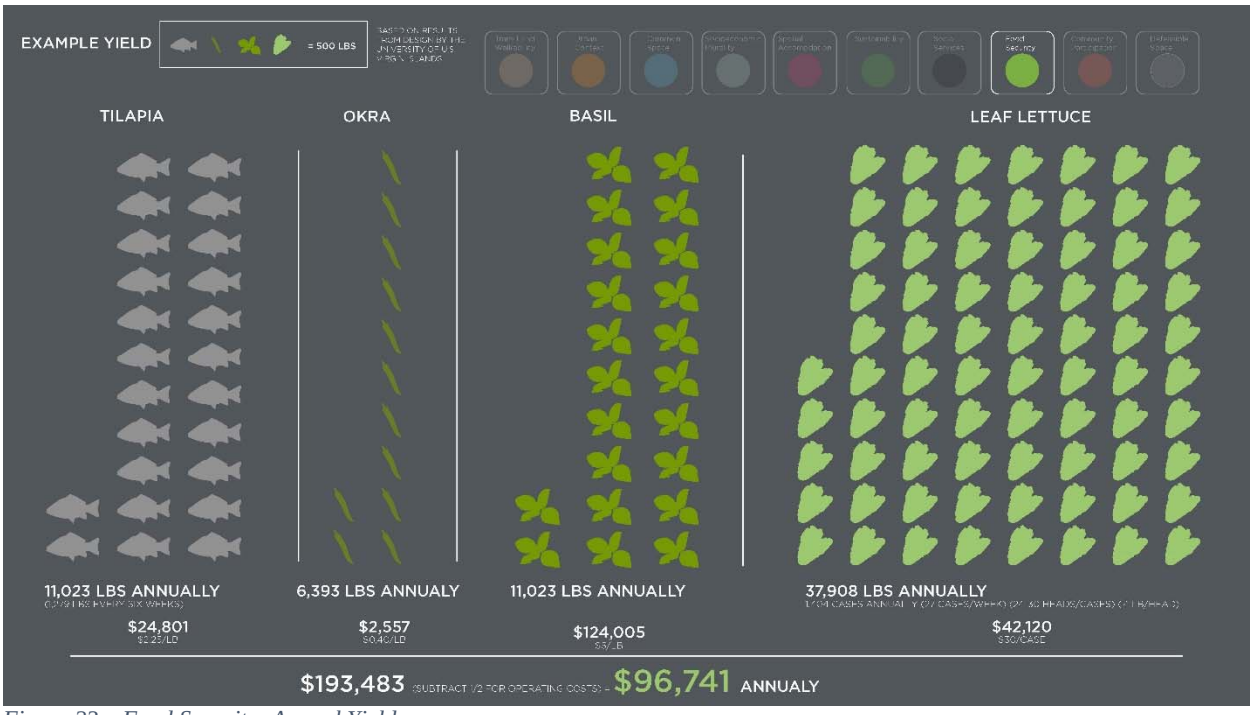

Figure 23 – Food Security: Annual Yield

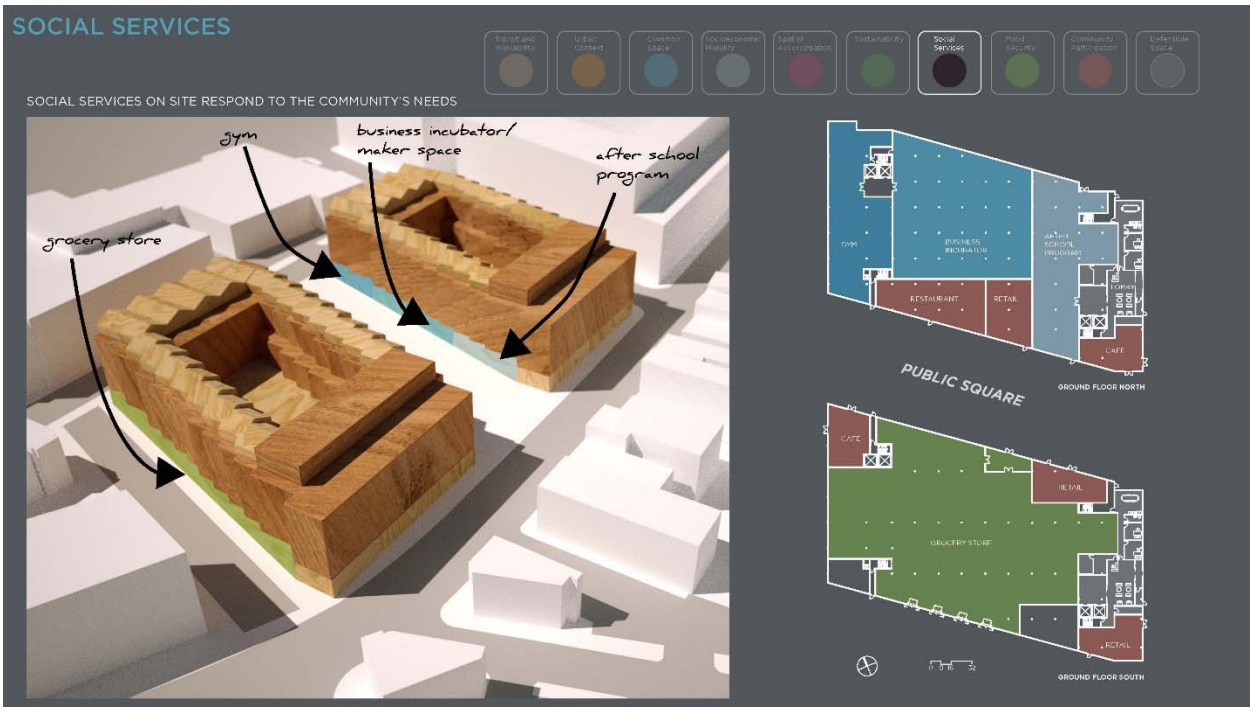

Figure 24 – Social Services: Plans

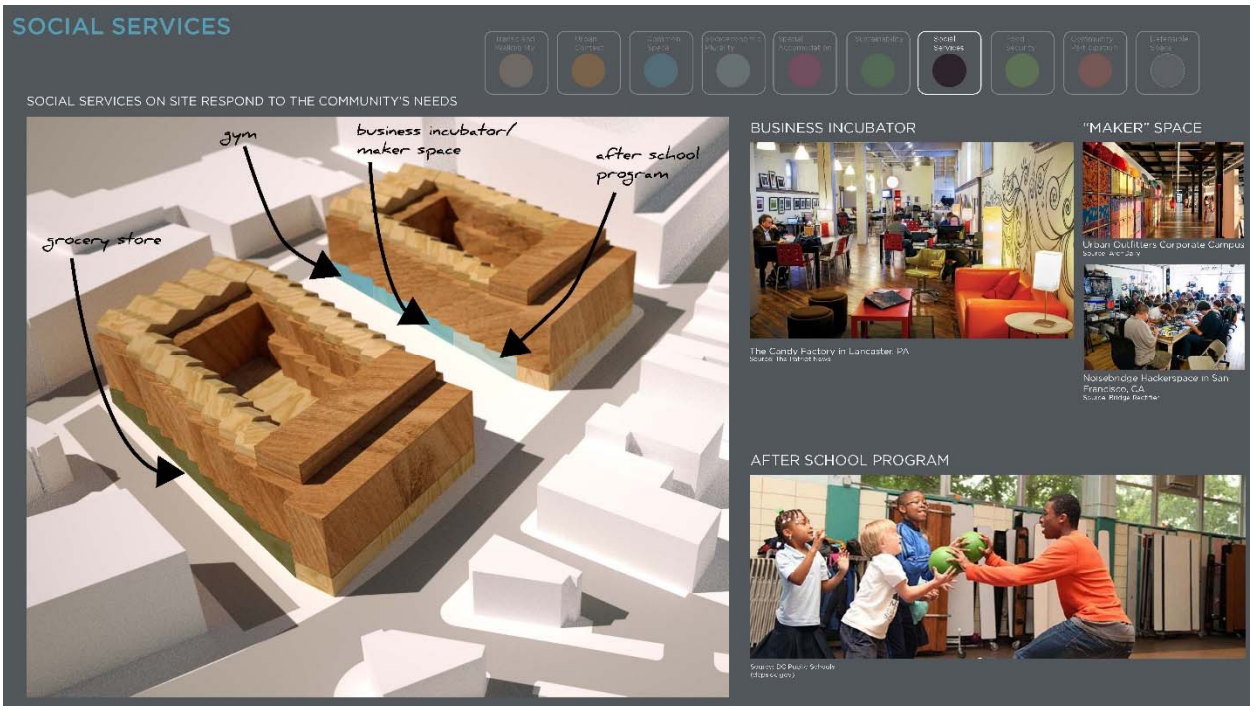

Figure 25 – Social Services

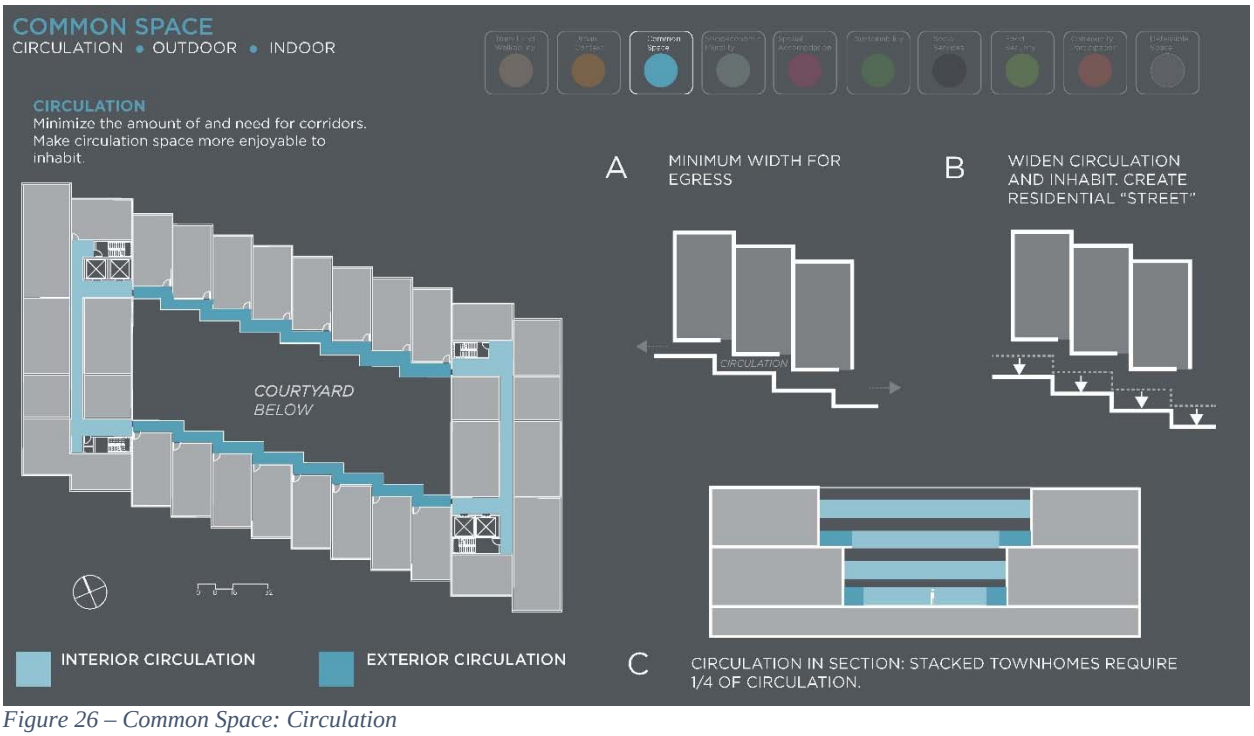

Figure 26 – Common Space: Circulation

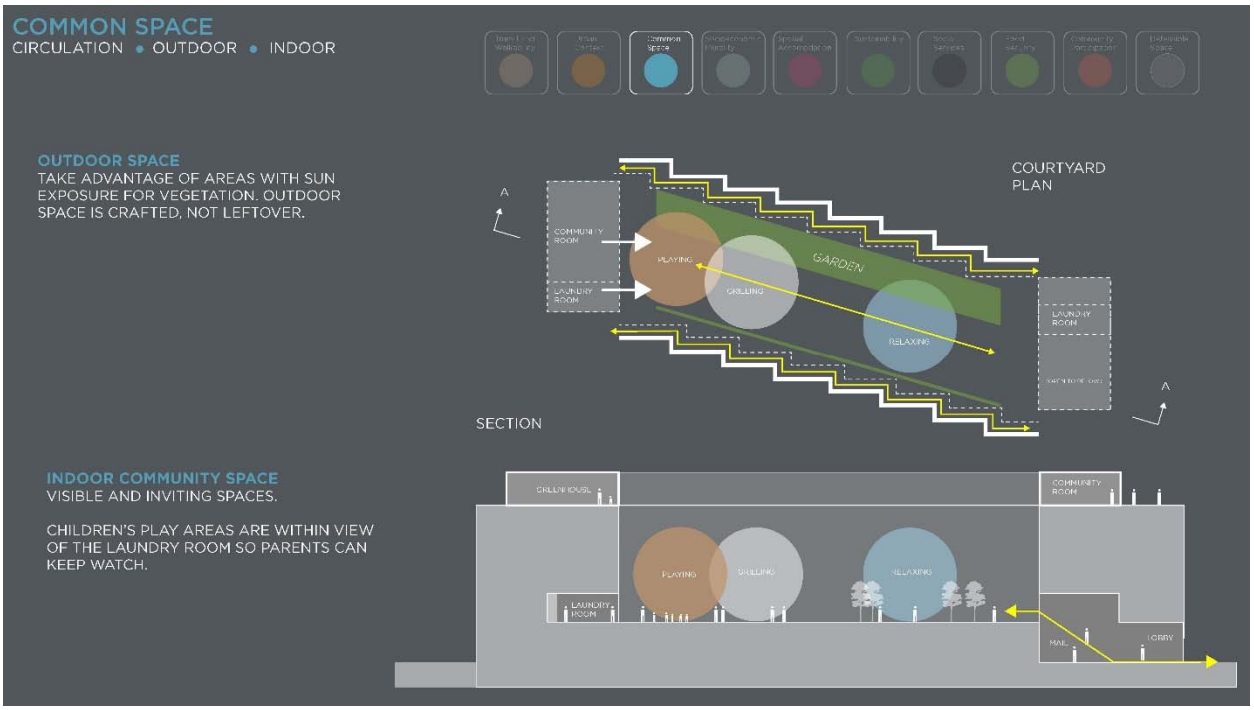

Figure 27 – Common Space: Outdoor and Indoor Space

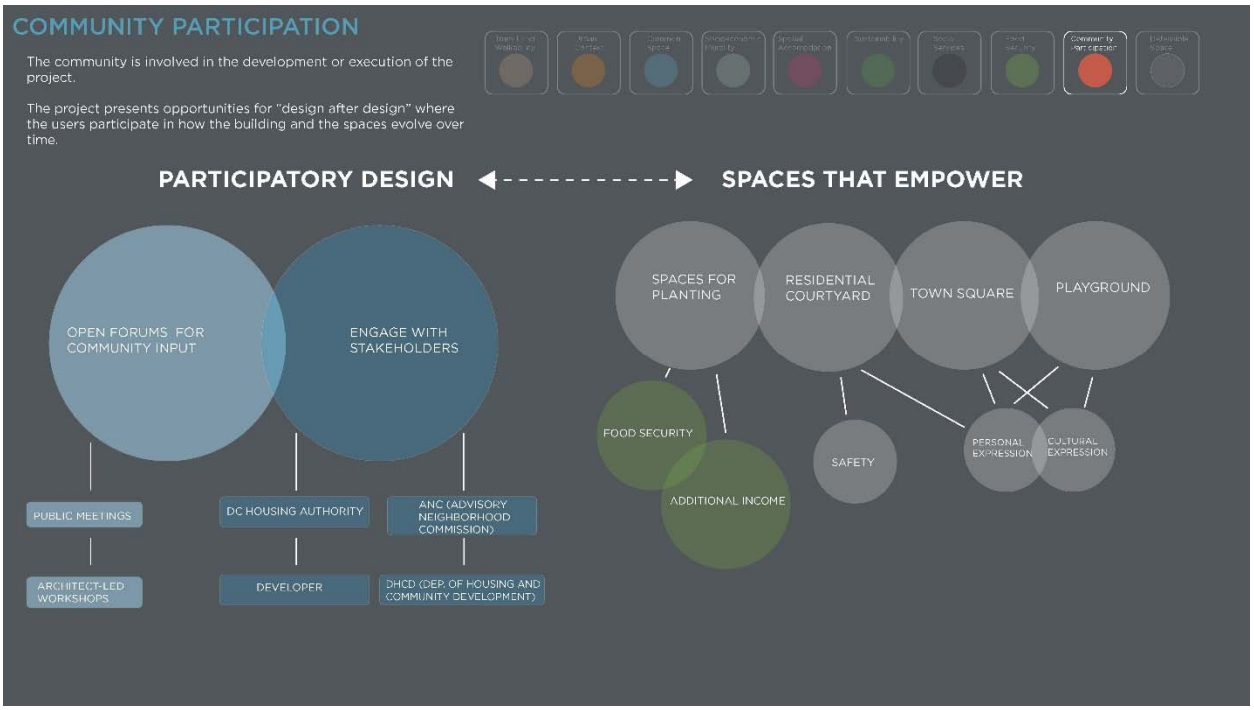

Figure 28 – Community Participation

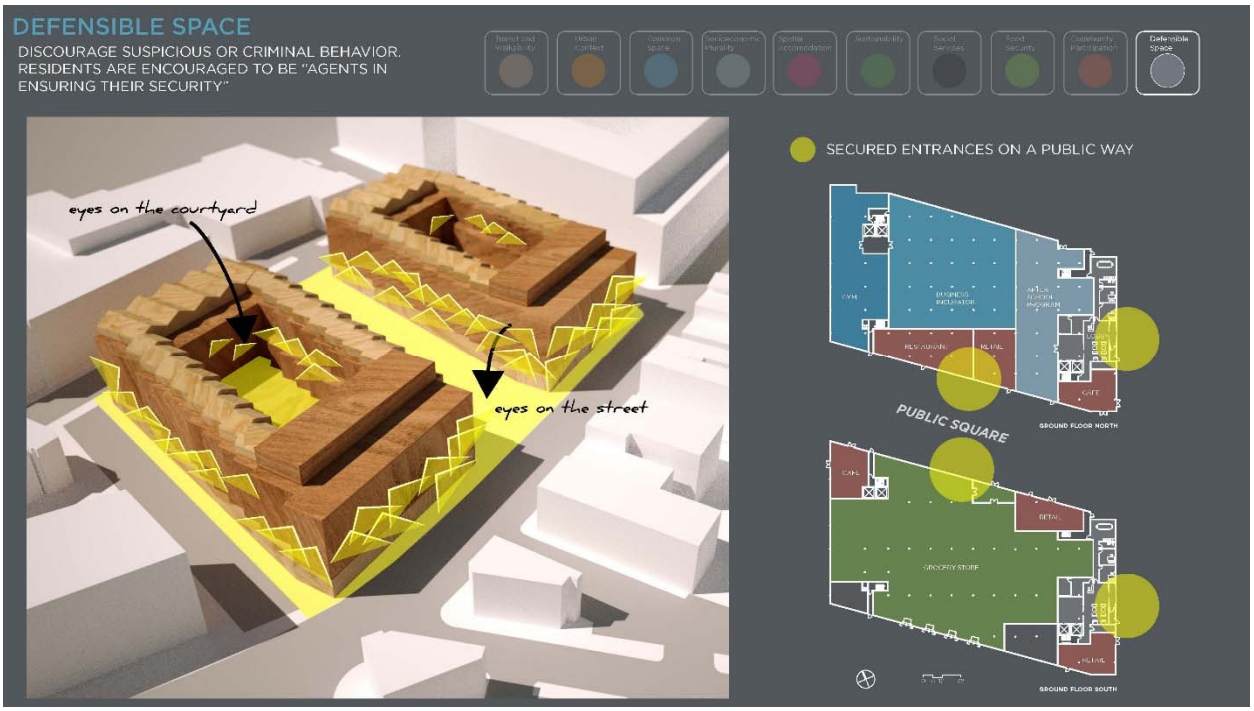

Figure 29 – Defensible Space

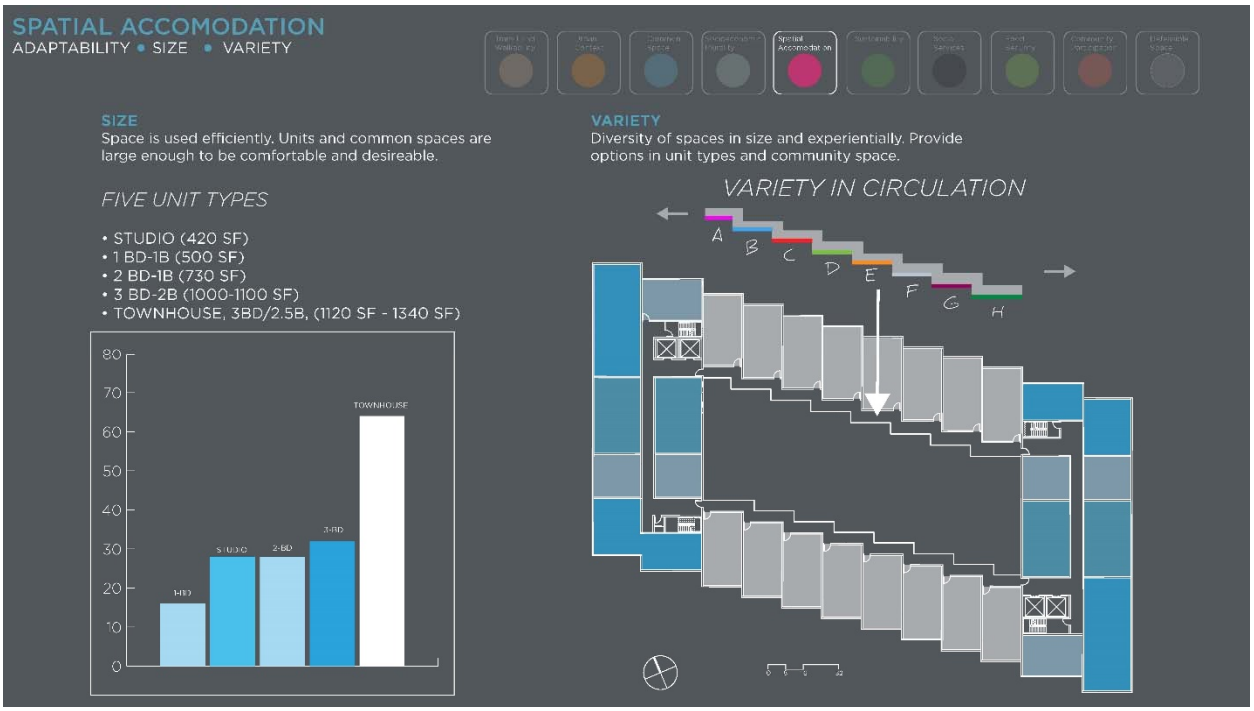

Figure 30 – Spatial Accommodation: Size and Variety

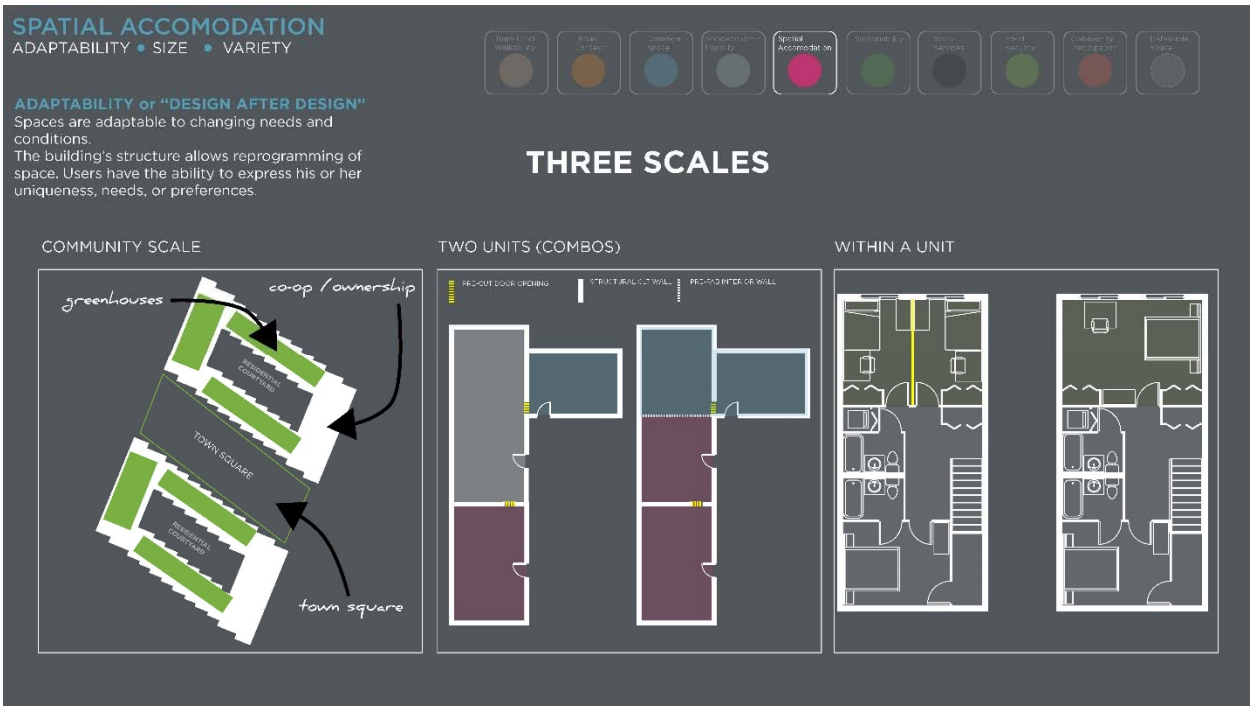

Figure 31 – Spatial Accommodation: Adaptability

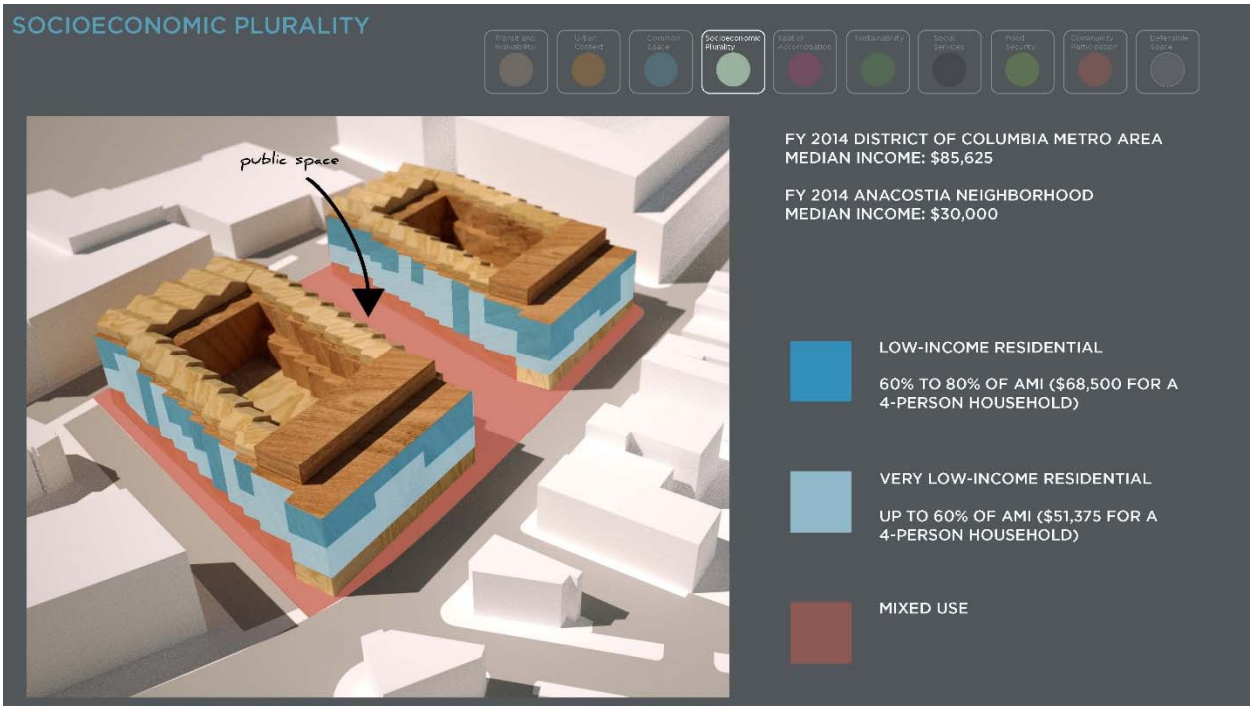

Figure 32 – Socioeconomic Plurality

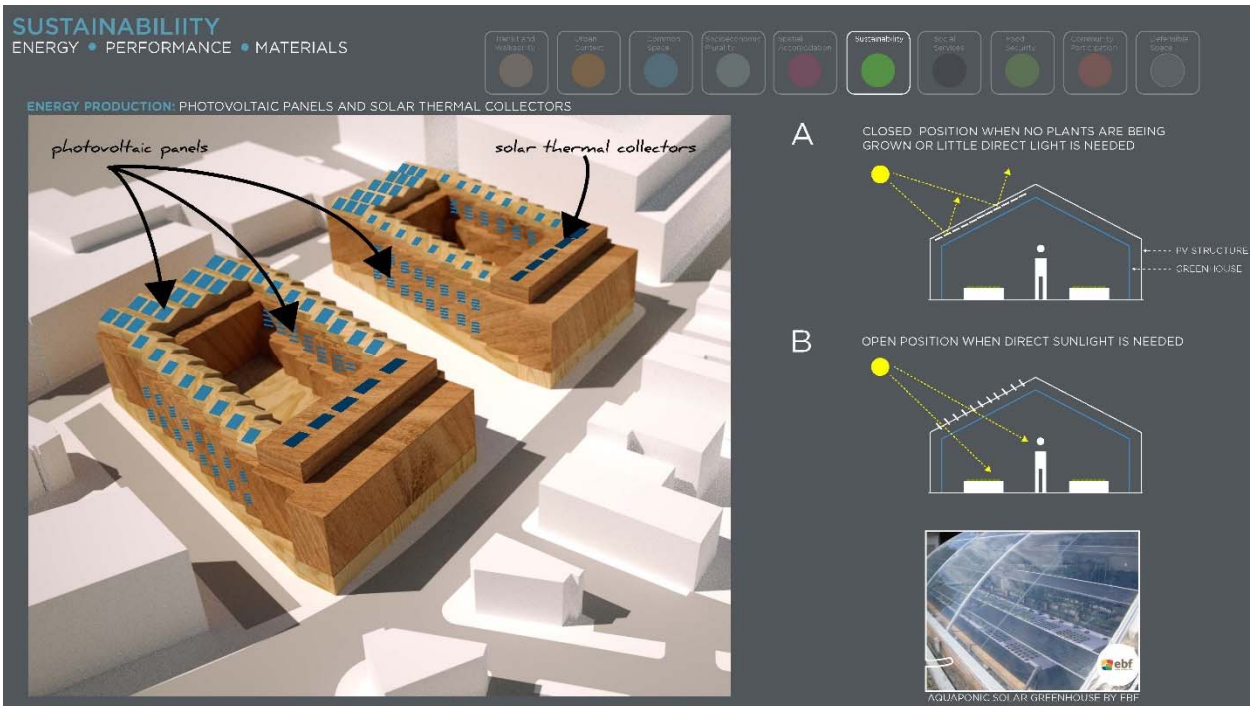

Figure 33 – Sustainability: Energy Production

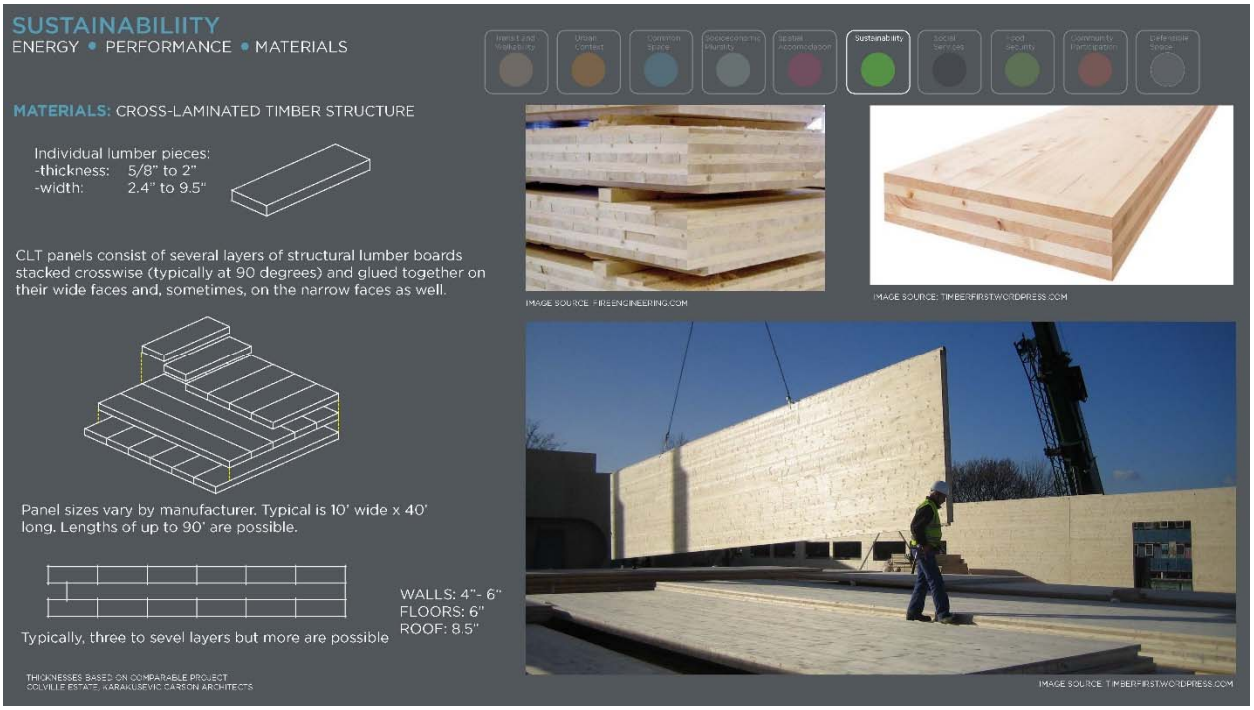

Figure 34 – Sustainability: Materials

Figure 35 – Sustainability: Materials and Construction

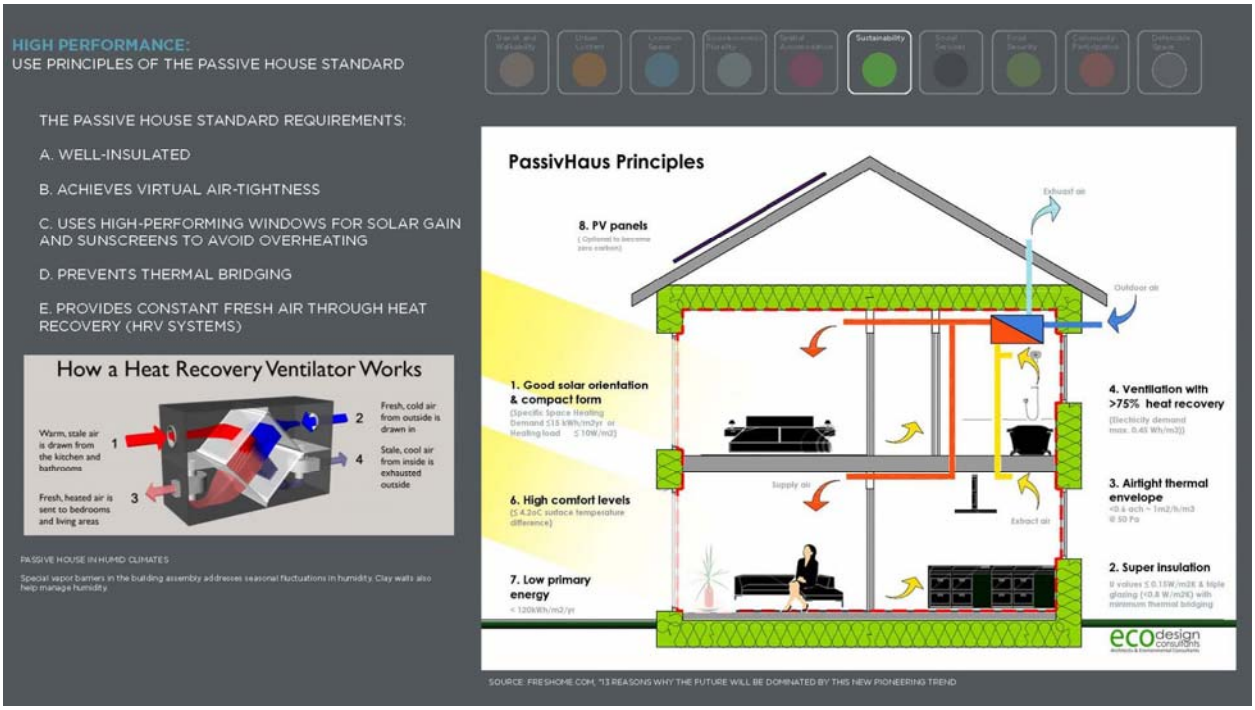

Figure 36 – Sustainability: High Performance

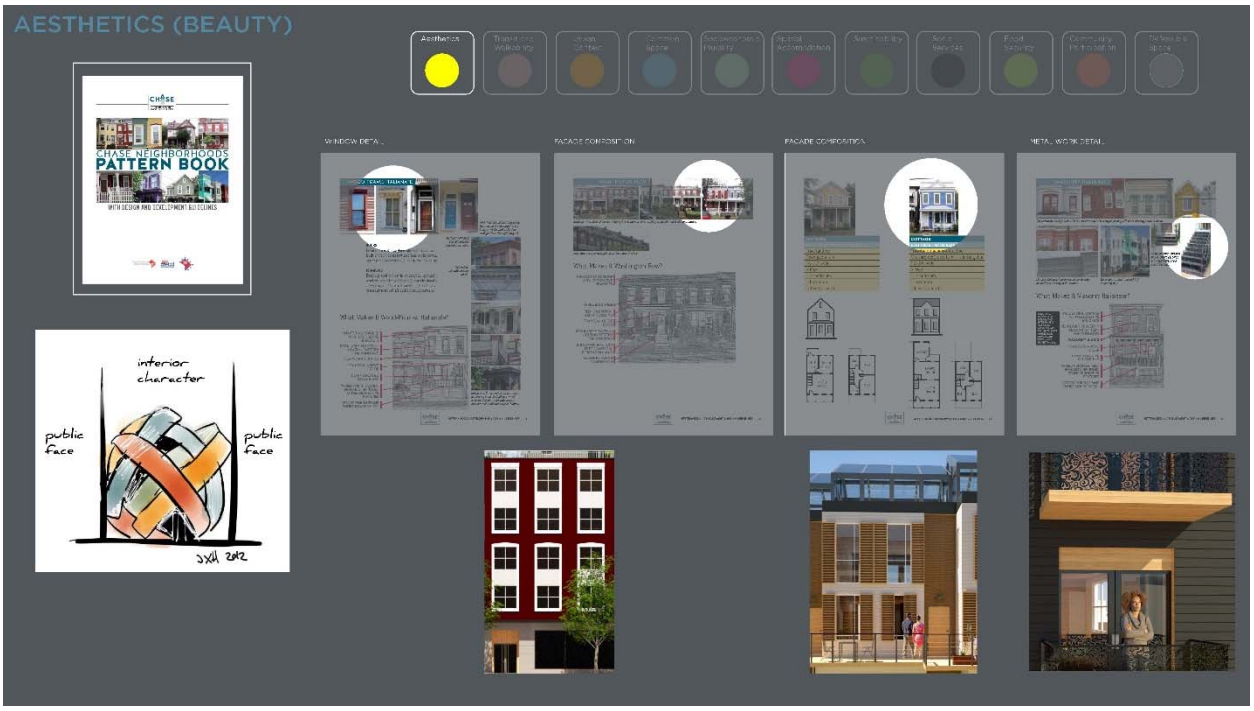

Figure 37 - Aesthetics

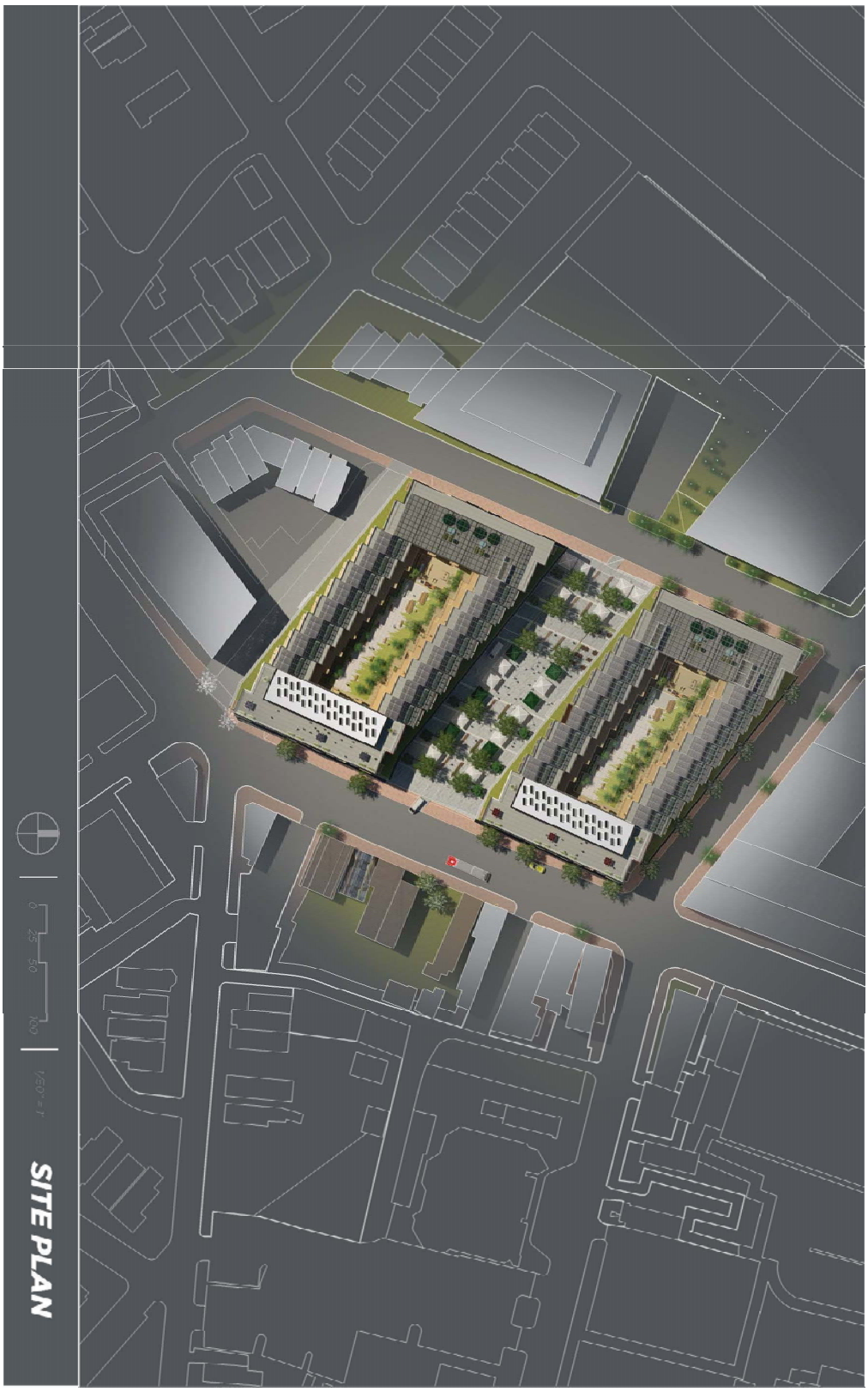

Figure 38 – Site Plan

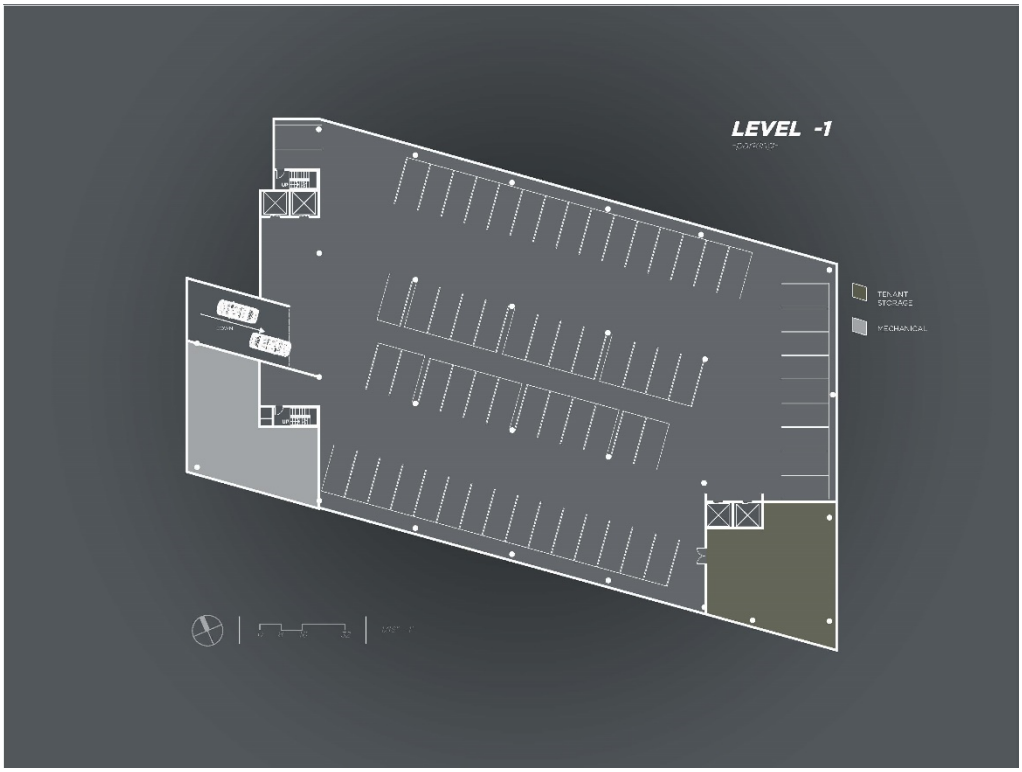

Figure 39 – Level -1: Parking

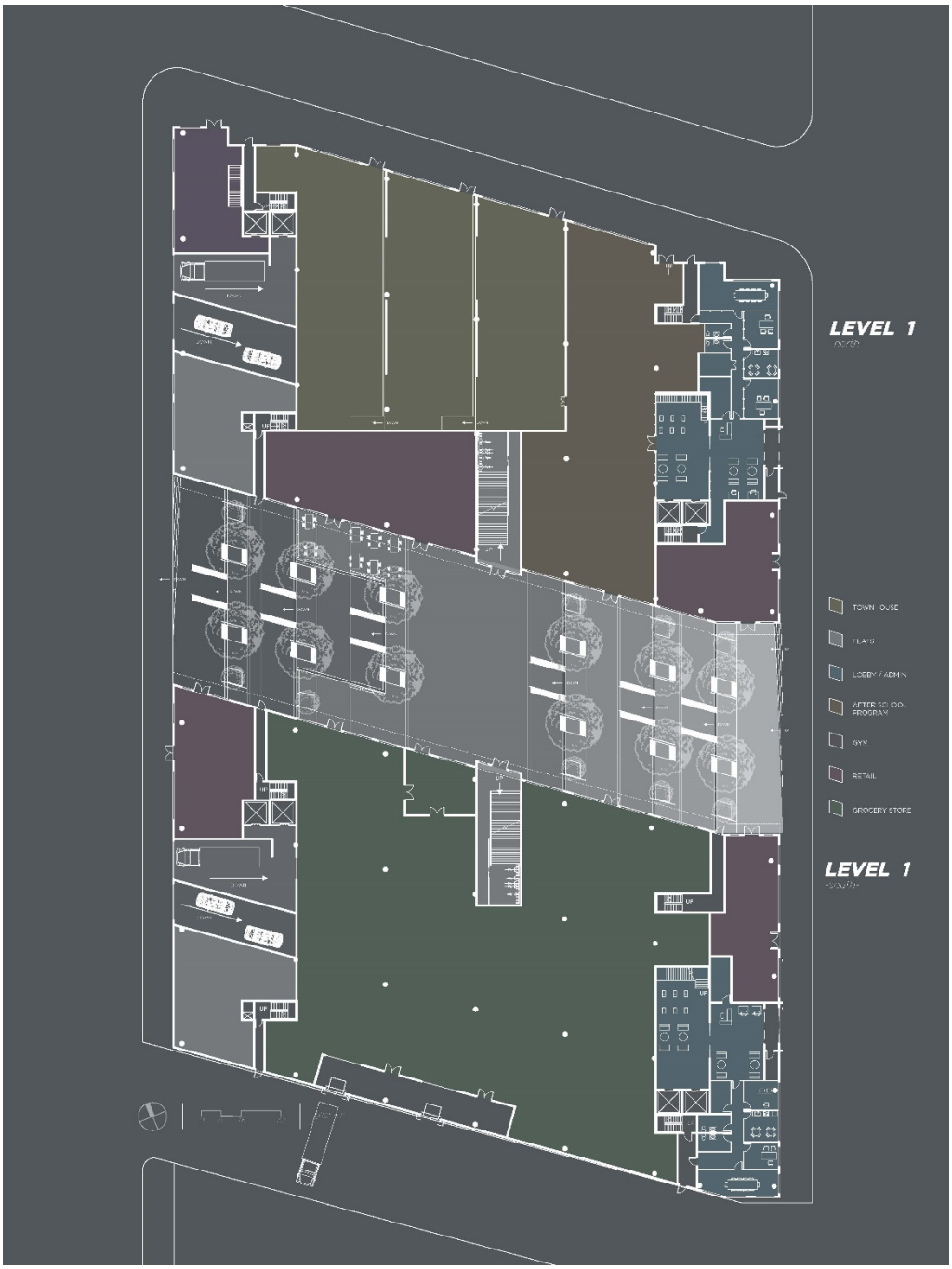

Figure 40 – Level 1

Figure 41 – Level 1.5

Figure 42 - Level 2

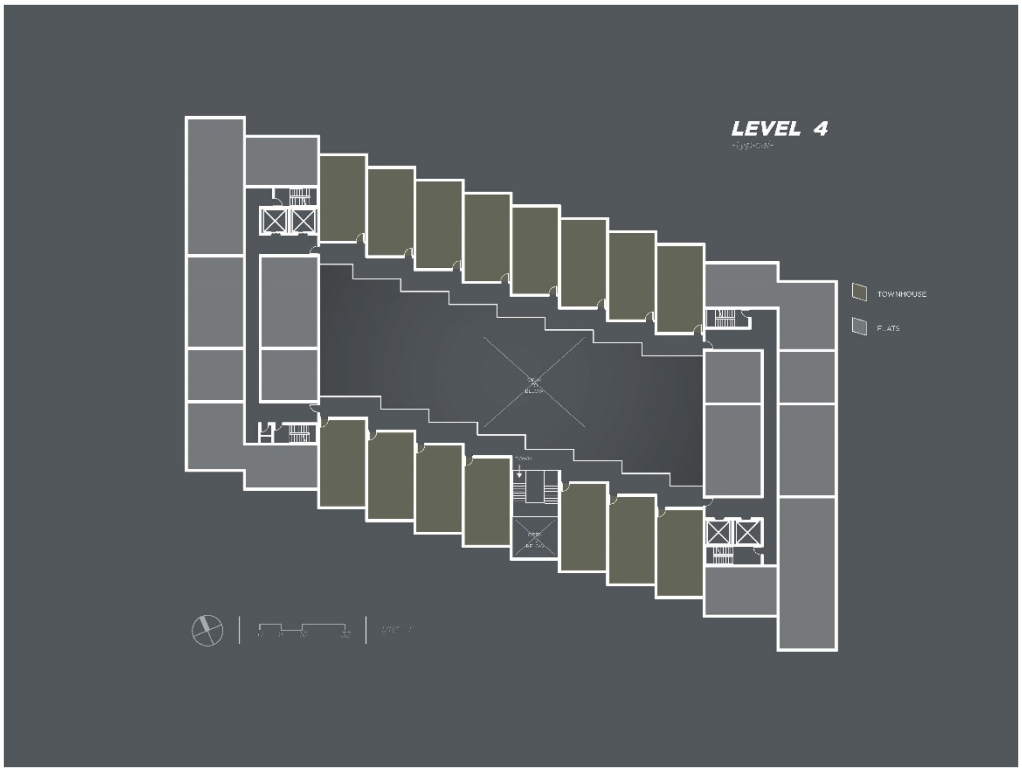

Figure 43 - Level 4

Figure 44 – East Elevation

Figure 45 - Section

Figure 46 – Aerial Perspective

Figure 47 – Town Square

Figure 48 – Courtyard Facade

Figure 49 – Courtyard View

Figure 50 – Courtyard View

Figure 51 – Playground

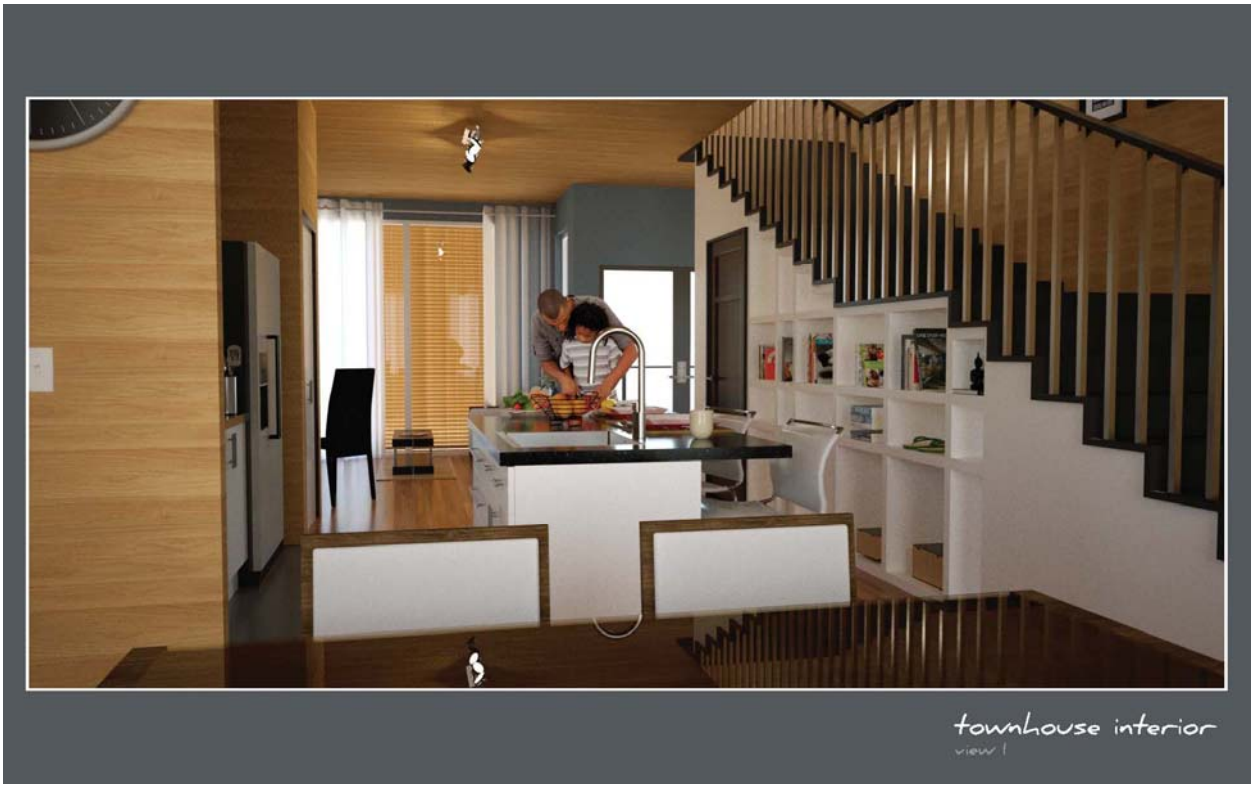

Figure 52 – Townhouse

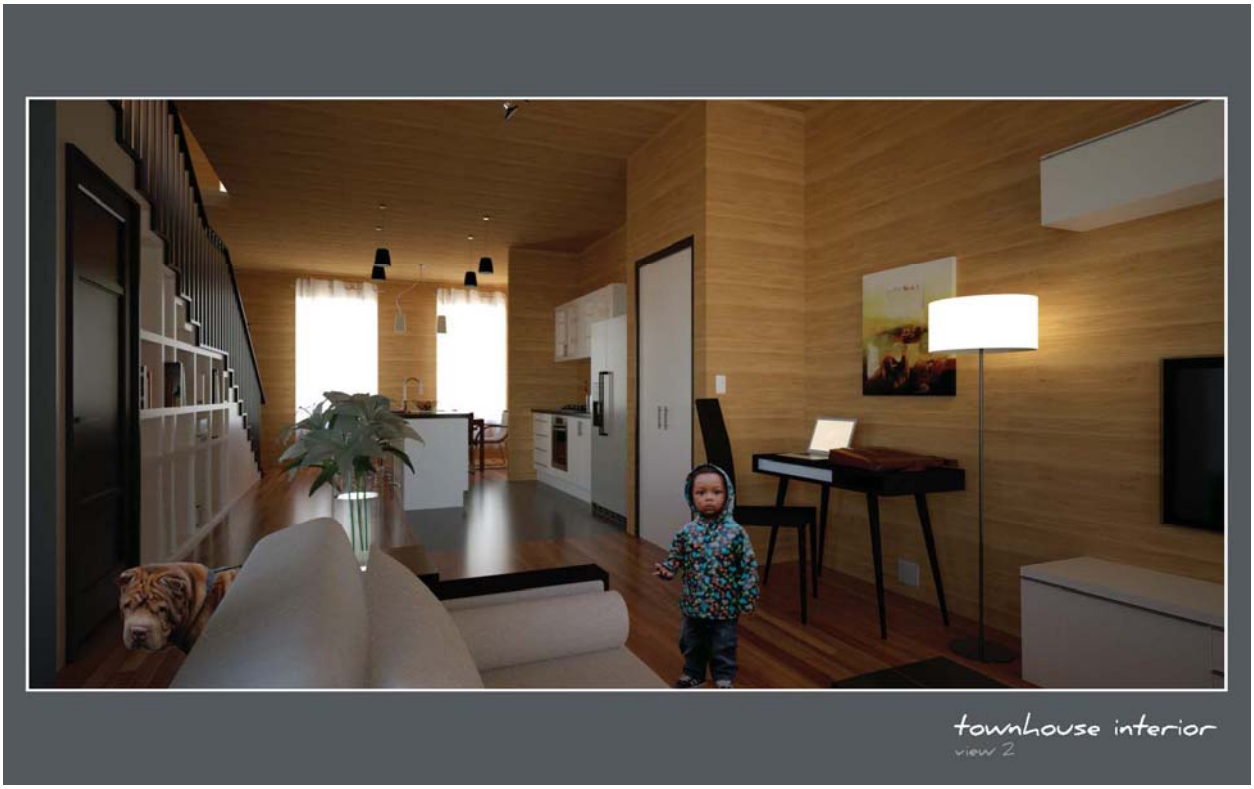

Figure 53 – Townhouse

Figure 54 - Balcony

Conclusion

The architecture profession must show leadership in addressing issues of social justice that are caused or exacerbated by the design of the built environment. Architects have one fundamental responsibility, which is to protect the health, safety, and welfare of the public. We must take some time to seriously reflect and ask ourselves if we are fulfilling this responsibility as a profession. Individually, architects ensure that their designs are up to code and that the buildings will not fall down. However, a building can do these things and still fail. Our buildings fail to challenge the status quo, to act on environmental degradation that has accelerated global warming, and to come to the defense of the public in matters of spatial injustice.

Architects, builders, and designers of the built environment face an urgent challenge. Responding to this challenge requires a comprehensive strategy which can be applied on a global scale. There is no doubt that local conditions and circumstances will require a modified approach, but attacking a global problem independently and in an isolated fashion will not create much progress.

This thesis project discussed how a simple design criteria can act as a strategy to move towards an architecture of social responsibility while also being mindful of environmental concerns. The thesis project explored how this criteria would be applied in the design of affordable housing in a low-income community. This criteria was divided into eleven criteria: sustainability, aesthetics, common space, spatial accommodation, urban context, community participation, defensible space, social services, transit and walkability, food security, and socioeconomic plurality.

These were presented to the public during the final thesis presentation on December 18, 2014. While the overall design was well-received, there was no discussion of the theoretical

framework that led to the design even though this was introduced at the beginning of the presentation. A conversation about the theoretical strategy taken in this thesis would have been more constructive, but the review panel was more compelled to discuss the specific formal design and its unique implications.

In order to make progress towards a socially responsible architecture, we must be able to take a step back and discuss the big picture and how and why the architectural profession is disengaged from it responsibility to protect the public interest.

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