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A House that Connects:
enriching life through connection to
inhabitant and site

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Abstract

The American middle class has little access to residential architecture that emphasizes the connectivity between the inhabitant and site. Increased connectivity is capable through the integration of sustainable design and application of design psychology. The principles of progression and nature connection are derived from precedent studies of both developer and architect approaches. Together, the two principles address numerous connectivity concerns and thereby inform a prototypical house approach for America’s diverse middle class in not only the present economy but also the future economy.

The principle of progression deal with both the inhabitant and guest progression on site, to, and through the design. Compression and release, prospect and refuge, public private separation, and permeability are directly affected by progression. Progression also ties in with creating and maintaining a connection with nature by meditating the transition from interior to exterior. The connection with nature includes both visual and physical access to nature from primary living spaces, sustainable design integration, and site planning. By integrating these two principles into middle class house designs, the house will begin to truly function as a home for the inhabitant.

Cover house images:
Polluck House ~ Bruce Goff
Earthship ~ Mike Reynolds
Two unknown Minneapolis, Minnesota Houses
Grow Home ~ Michelle Kaufmann

American architecture tour
Peter Ekama, 2009.
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Preface

I believe that nature is necessary for healthy living and essential for positive developmental health. One lives better in a house that facilitates human interactions with nature (projectevergreen.com).

The designed environment should invest in quality instead of excess quantity. It follows that resource valuation is based on the five types defined by Professor George Honadle: human, social, physical, financial, and natural. Revaluing of these resources results in a paradigm shift from a focus on stuff, to a focus on family and relationships. The old adage that money cannot buy happiness, still holds true.

The average American residence meets the needs of neither its present inhabitants nor its future generations of residents. By definition (WCED), the current American housing paradigm is un-sustainable. Buildings that address the needs of individuals must do so on the most basic level in not only the physical but also the physiological and psychological levels. It is essential in the field of architecture to produce buildings that meet these needs to the best of the designer’s capability.

An associated concept is that sustainable design should be integrated as a quality baseline that deals with areas beyond the strictly quantitative. This thesis utilizes sustainable strategies as the best business practice in order to provide inhabitants with the most efficient and effective house for their needs. Sustainable design builds value into projects on a very real and tangible effect.

Literature on the theoretical underlying influences on the American consumer mentality are utilized to supplement precedent analysis in areas of house utility, place, placelessness, subconscious, and human development. Comparisons between
the four precedent types yield effective principles to address the shortcomings of the current architect and developer home builder practices.

   Design has been regulated to those who are capable of affording the design process as a result middle class Americans are largely denied the intrinsic benefits of designed structures. A house that is affordable to the middle class and makes a positive impact on it’s inhabitants and site.
The single family detached house originated prior to the establishment of the North America country. Early settlements followed more or less the European medieval village model, consisting of groups of houses in small towns when not within urban enters. In 1841, Catharine Beecher wrote a treatise on “domestic economy for the use of young ladies at home and at school.” The textbook linked home with piety and purity – promoting the separation of female (suburban home) from male (business, urban)” (Salamon XII). As early as 1880, Charlotte Perkins denounced suburban dwellings. During this period, ideal city concepts proliferated. In 1869, Olmsted and Vaux contributed to the standard development model with Riverside. Houses lined curvilinear streets to maintain a picturesque aesthetic. The zoned minimum lot size of 100’ by 20’ and minimum 30’ setbacks from the property line ensured that the retention of open space. Fences were prohibited so that the overall impression of owner-occupied houses set in park would not be lost (Kunstler 52).

The Jeffersonian idea of a nation of small, equal landowners did not materialize until the end of World War II. The post-war national housing shortage revolutionized the way American’s lived. No longer was the suburban home an oddity, instead, it became the cultural ideal. Once integrated into the American Dream, the home achieved symbolic correlations that remain today. “Americans developed a distinctive way of life, one based on rising incomes, a vast array of consumer goods, broadening educational opportunities, rising levels of home ownership, and access to a style of living heretofore unimaginied. This way of life was a
The suburban way of life (Beauregard 14).” The notion that connects single-family homes with equality and democracy is related to the original definition of husband, which once meant housebound— that is, a man who lived and worked in his own home, neither serf nor servant to a lord, but also not a lord over another. In other words, the middle class” (Susanka 5).

Postwar houses reflect the culture that created them through not only their construction technologies but also the social relationships evident in their spatial organization. Soon consumption displaced the collective resolve that characterized the war effort (Beauregard 8). War facilities were retooled and raw materials were redirected to house production. Balloon framing, premixed concrete, screws, gypsum, and plywood are a few of the resulting innovations. Transportation paralleled and fed suburban development in the 19th and early 20th Century (Beatley 9). Along with the physical means for house production came the economical means. The Veteran Administration mortgage program and later the Federal Housing Agency steadily promoted the single-family home by backing mortgage financing (Salamon XII). William Levitt had worked with developers and banks, during WWII, to create the Federal Housing Administration (FHA). The theory behind FHA was that houses are good because everyone benefits from the economic engine they stimulate.

With both funding and physical means the Levitt brothers set about developing what is considered the first suburban development or tract homes. On Long Island in 1947, the brothers turned 4,000 acres of potato farms twenty-five miles East of Manhattan into 17,400 “750 square foot (plus unfinished attic) detached single-family residences on 6,000 square foot lots. Houses were sold complete with a washing machine, an option

The suburban home buyer is “not just buying a house, he’s buying a way of life.”
~ William J. Levitt
on a television, and a covenant that maintained racial segregation” (Salamon XII). The newly created middle class literally bought into the consumer ideals of the American Dream, and has since perpetuated the premise. The consumerism that drove postwar economy included “novelties, like greater individual mobility, increased leisure, higher rates of product obsolescence, and a tighter bond between status and consumption” (Beauregard 122). The house was no exception; since WWII, leisure and segregated living patterns made utilitarian houses less desirable, while also perpetuating houses focused on the consumer economy. The result was a marginalization of the individual’s basic need for connection to place.

“During the postwar era and up to the mid 1960s it is surprising the extent to which talented architects lent their best ideas to the developments of production home builders,” something that happens very rarely today (Karrie Jacobs). One such architect was Frank Lloyd Wright. Wright designed the Usonian house for the “citizen of moderate means” to solve the problem he described in his 1954 article, *The House of Moderate Cost* as “not only America’s major architectural problem but the problem most
difficult for her major architects” (qtd. in Twombly 275). The concept for the houses began in 1932 and a total of 140 Usonian houses were eventually produced over the decades. Wright attempted to address the growing disconnect of the tract house from the inhabitant, site, and community. The Usonian house ultimately did not replace the tract house model, though it achieved great success in informing them. Standard detail sheets were completed for the Usonian’s and were available by 1939. As builders became more familiar with the system, they began to build the Usonian house around the nation (Pfieffer 49). Its influence is evident in the numerous ranch house and ranch house variations that blanket the country. Though a distilled version of the Usonian house, the ranch retained among other things, the low profile roof, the combination of the dining and living space, and often the split level. Post war usonian houses were no longer able to be constructed at the same price due to an increase in the cost of the skilled labor necessary. The question became, “can people with even more limited means [than a young couple with a limited budget] experience the liberation, the sense of freedom that comes with true architecture?” (Pfieffer 52).
A contemporary or Wright's later work and example of architect led influences on the Middle class home, was the Case Study House Program. In January 1945, John Entenza, editor of the Arts & Architecture Magazine, commissioned eight architect California based offices: J.R. Davidson, Richard Neutra, Spaulding and Rex, Wurster and Bernardi, Ralph Rapson, Whitney Smith, Thornton Abell, Charles Eames and Eero Saarinen. They were charged with designing “prototype low cost houses using standardized, mass-produced components” (McCoy 4) that offered the “best conditions of life to an American middle class family” (Buisson and Billard 27). In addition, they were to promote modern living and, therefore, reflect the age in which they were made. So, with the “growth of prosperity and full employment during the 1950s the houses began to reflect the needs of an increasingly affluent middle class” (McCoy 4). In the 1960s the three houses designed by Killingsworth, Brady, Smith Associates reflected the program’s shifting focus to community related designs. By 1960, the custom-built family small house was being priced out of existence. The Case Study House (CSH) was a social program; it essentially ended when the house became a
luxury” (McCoy 5). The project ended due to the “economics of design; the lending agencies have always been form makers. Design seems to advance by outwitting them” (McCoy 4). The program received no government subsidy with the clients paying for each house. By 1962, “it was clear that the battle for housing had been won by the developers, with more drafting services involved than architects. Housing was a gigantic industry, and the cost of land and construction was a greater concern to builders than good environment” (McCoy 5).

Developer home builders took over the majority of the middle class housing market with a template of houses featuring varied upgradable choices, harkening back to the original Levitt developments. Ryan Homes, a contemporary of Levitt, began in 1948 as a small, family-run business in Pittsburgh, Pennsylvania and is now the fifth largest builder in the nation (Ryan Homes). The company was started with the goals to design, build, and sell affordable quality houses. Ryan Homes continues to offer a series of choices for each of its now 140 floorplans. In the past sixty years they have built over 300,000 homes. Today, Ryan Homes builds homes in 18 metropolitan

Rise in House-to-Person Ratio
Environmental Building News,
areas in 11 eastern states: New York, New Jersey, Pennsylvania, Delaware, Ohio, Kentucky, North Carolina, South Carolina, Maryland, Virginia and West Virginia (Ryan Homes).

The transfer of the middle class home to developers coincided with the first major instances of sustainable design. In the late seventies, it produced numerous ecovillages, co-ops, and self-sufficient dwellings constructed by homeowners and architects alike. Despite their widespread application, and influence from vernacular design and European Critical Regionalism, they rarely affected the mainstream middle class housing market.

By the 1970s, the majority of architects were content to complete custom homes beyond the reach of the growing middle class. The house solidified its role as an investment and through the late 1980s to 2007; house sizes paralleled the expanding bull economy. By 2000, the average house had doubled in size since the 1950s, despite a decrease in the average family size (Environmental Building News). Additional space in the home was paralleled by increased numbers and types of goods and consumer products to fill it. Ironically, during the same period of time sustainable and ecologically conscious design re-immersed as significant players in not only the commercial but also the residential markets.

Both Architects and developer home builders benefited from the late 1990s to mid 2000s bull market. Upper and upper middle class Americans sought architect designed houses, while developer home builders responded to middle class consumer demands with ‘green’ features that range from various finishes and rooms with daylight, to proximity to parks. These aspects while positive, should not have be seen as perks, but instead as basic necessities of any house and site plan. The fundamental home builder house remained

a mix of eclectic traditional styles, multi-car garages, and various band aid applications like the massive roofs. The resulting miniature mansions echoed their more opulent counterparts and were made widely available to the American middle class, earning them the derogatory nickname McMansions. Ironically, while architect houses are often perceived as “too much style and not enough content” (John Milnes Baker 147), home builder houses have escaped with little criticism. Despite their continued functional design issues like excess space, which costs more to upkeep and operate, home builder models succeed in making home ownership a reality for numerous Americans.

In 2002, Randy Brown an architect developer based in Omaha, Nebraska began the speculative residential Hidden Creek development. He joined the handful of architects currently attempting to address the need for a contemporary sustainable middle class American house. The houses are comparable to the developer house builder models in size and amenities while making them modern styled and integrated with sustainable strategies. A total of twelve eco-modern houses are planned for the compact site, three of which were completed and sold prior to the housing market decline.

In 2007, the recession slowed the booming housing market (NBER) and primed the market for a reaplication of efficiency in new housing. Americans are already becoming more receptive of a minimizing approach to wants and needs. Steve Kerch, of The Wall Street Journal, noted that, “while the small-house movement in the U.S. has been gaining steam for a number of years, the recession has accelerated it.” 2008 saw the first annual decrease in the average new home size since 1994 (US Census Bureau). The reductive trend should continue as long as people continue to scrutinize their choices in consumption and lifestyle. The recession actually offers an
opportunity to produce contemporary architecture that synthesizes new ideas, sustainable practices, and technologies while reflecting on a region’s past to ensure that a unique character and identity are not lost. The age old American approach that “bigger is better” could be replaced with a sustainable living model that revolutionize the future of the American house.
CHAPTER 2

Problem

A reduced housing market and official recession signal the need for a corresponding and appropriate response in the house. A leaner more efficient house model that addresses the excesses made possibly by cheap energy and economic prosperity, stands to succeed in future fluctuating markets. This approach requires a re-valuation of design in the home to effectively bridge the gap between the architect designed and the economy driven developer home builder models. The short terms costs and excesses of the architect designed house and the long term costs and excesses of the home builder house move both house types beyond the reach for the middle class. A synthesis of the two extreme positions, and the integration of sustainable design strategies holds more promise of enriching the inhabitant well-being of the largest portion of the American population, the middle class.

Redefining the Housing Paradigm

Developers know that the people base the purchase of their house on aspects that are “either investment considerations or aspects of very individualistic consumption choices” (Beatley 19). Therefore, the house is staged to grab one’s attention with the “house’s curb appeal, the influence of the neighborhood, the perceived security, the appliances, and accoutrements of the house itself” (Beatley 19). The home builder’s focus on elements that evoke nostalgic connections to home has gone beyond the point of functionality to being kitsch. Peter Calthorpe, a San Francisco architect and planner, makes the distinction between sound building traditions and nostalgia in his projects. He states that “tradition evolves with time and place while holding strongly to certain
formal, cultural, and personal principles. Nostalgia seeks the security of past forms without inherent principles.” Granted, not all nostalgia should nor can be removed from the house, given its intrinsic nature as a house.

In *The Pattern Language*, architect and theorist, Christopher Alexander describes houses with connectivity amongst adjacent positive elements as possessing “aliveness,” while those with poor connects have “deadness.” The patterns that create and enhance the positive connections are “consciously based on the deep human emotional and psychological needs: the need for greenery, sunlight, places to be with others people, spaces to be alone, spaces for the young and the old to mix, for excitement, and tranquility” (James Kunstler, *Native to Nowhere* 251) among others. The six foot balcony pattern is an example of capitalizing on the utility and purpose of the balcony. The six feet are prescribed, because anything less is rarely used by inhabitants. Alexander goes further in suggesting the balcony or terrace be at least partially recessed in the building so it is not projecting out like a separate element. Another pattern is daylight on two sides of every room. Since Alexander’s vocabulary for the patterns was derived partly from building traditions and partly from common sense the result is appropriate solutions to the connectivity problems in the house.

The second problem with the current house paradigm, also noted by Timothy Beatley in *Native to Nowhere*, is that the inhabitant has been largely disregarded except, of course, in their most important role of investor. Homeowners do not own homes, they have investments which are subject to fluctuations of the market and are ultimately capable of being lost or sold in the short-term. Inhabitants have ascribed to this belief, so instead of seeing the house as a place to live, or being an
object of permanence in life, it is first seen as an investment. “For many Americans... choosing and purchasing one’s house is primarily and essentially an economic investment decision, more a matter of economic return than about joining and becoming part of a community” (Beatley 19). Renovations are focused on increasing the market value of the home instead of investing in the quality of life for inhabitants. Even now, appraisals are based on finishes, number of rooms, and aesthetics instead of how well the house functions or the quality of the spacial environment.

The sweep of housing foreclosures since 2007 were a litmus test for the state of the United States economy (Economist). They reveal the depth of the error in viewing one’s home as only a commodity and over-extending oneself in order to achieve it. The global economic meltdown demonstrates fairly pointedly that living beyond one’s means is not a sustainable mode of living. By having less, one can invest in time and the intangible instead of depreciating products. Distilling the home to an economic investment instead of what it should be first and foremost, that is its name... a home, has produced the majority of the residential architecture visible today. The house must return to its first role as a place to live and then be viewed secondarily as an investment.

The house paradigm needs to reintegrate sustainable practices to be viable for both the inhabitants and their future generations. Jason F. McLennan, author of The Philosophy of Sustainable Design, notes that sustainable design has progressed into the realm of philosophy due to its broad impact, and the numerous directions and converging independent actions that are bringing it to the fore. The breadth and depth of sustainability is such an immense scale of changes, that it requires our society to shift many of its long held paradigms. It is a way of thinking that strives to

“The important thing about a house is not that it is a list of activities or rooms but that it is a pattern of space, governed by intricate conventions about what spaces there are, how they are connected together and sequenced, which activities go together and which are separated out, how the interior is decorated, and even what kinds of household objects should be displayed in the different parts of the home. If there are principles to be learned from studying the design of dwellings, they do not yield easily to a superficial analysis of ‘basic human needs’.”

~ Julienne Hanson, Decoding Homes and Houses
be more holistic in nature and in doing so make better products, environments, and systems for the present and future societies.

Unfortunately, instead of applying the sustainable design philosophy to the processes that drive American middle class housing, the tendency has been to continue using the existing developer housing and architect housing standard practices. The Architectural Graphic Standard development templates have little bearing on the actual functioning of the home to benefit the inhabitant or site (Kunstler 259). By retaining the standard format, the few efforts that do exist often rely more on greenwashing and branding then on actually changing the design focus of the middle class house. Ryan homes touts its green appeal via energy star ratings. Recycled content carpeting, engineered trusses, certified wood cabinets, low-e windows, house wrap, silicon seals, and insulated doors are among the energy saving strategies added to their base model (Ryan Homes). The house program and site organization remain the same, mitigating the benefits of sustainable design and resulting in a house made essential of different materials.
GreenSource Magazine recently published an article on a house that scored several LEED points based on the use of standing-dead timbers clad the exterior and salvaged timbers make up some of the exterior rafters (Sokol). Addressing sustainability as a finish material regulates it to just an application as opposed to its holistic integrative nature.

Developer home builders and architects are serving neither their clientele’s nor the environment’s best interests by irresponsibly producing mediocre connections. James Chung, president Reach Advisors, a market research company, said that, “most home builders are reluctant to change the formula that made them so profitable over the past ten years.” (Lichtenstein). There is a disconnect between home buyers and the home builders and land developers who are supposed to be catering to them (Lichtenstein). Ineffective use of site, space, and materials, leave homeowners little choice but to settle for housing non-conducive to their financial, physiological, and psychological needs. Houses are hardly fulfilling their role as homes. The resulting dilemma is that those who can afford to ‘go green’ in their home or even their second home do so, while the American middle class is left without a truly viable sustainable housing option.
The Second Home Phenomena

The house has been associated with not only economic stability but also personal autonomy, both of which relate to the actual and perceived social status of individuals. The social perception that size equates to prosperity has produced huge houses that completely dwarf others and have a room for every conceivable need. In the past, “even the most ordinary tract houses, the ’little boxes made of ticky tacky,’ were sane and sustainable compared to today’s suburban palaces” (Karrie Jacobs). Interestingly enough, those opulent enough to afford larger houses have often sought a second house of more modest means. These second homes, whether cottage, cabin, lake house, or ski lodge hint at the greater issue at hand. They fulfill needs not being met by the primary house. Despite the grander scale, the primary house lacks many of the connective aspects prevalent in the second home. These second houses first and foremost connect with the inhabitants who seek them out as places of respite and recreation. Their locations often offer the proximity and access to nature and its amenities, satisfying the psychological need for continuity with nature. To offer these connections to the middle
class, Frank Lloyd Wright suggested an exurban living pattern, evident in his Broadacre plan and later Usonian houses.

Secondary homes are typically of a smaller scale. To translate the second home approach to the primary house the excess square feet would be traded for more substantial connections to site by way of views, access, and orientation. The smaller house size also addresses the recently more pressing economic needs. The recession has led many families to re-access their wants and needs, a house that can respond to a more physically modest lifestyle, while adding emotional richness stands to benefit both the market and consumer.

Though the majority of Americans are unable to completely articulate their criticisms of the existing house models, they recognize that they want their houses more akin to the second home. Their romanticization lends further support to the desire to have one. Since all classes seek to take on the characteristics of the class above them, the middle class does and will continue to desire the same solace in their homes, but lack the means to do so in the present housing model.
Defining House and Home

In the United States the single-family detached home is the ideal. “The preference doesn’t appear to be a matter of socio-economic class - people seem to reject apartment settings and prefer suburban houses regardless of ethnic or social background or the kind of housing environment they occupy at the time” (Gunter 19). As the American ideal, interactions with the physical house environment often evoke associations and affective responses. “There are strong psycho-social and socio-cultural relationships between residents and material aspects of the dwelling. The use of home tends to confound these responses and relationships with the physical elements themselves” (Rapoport 45).

“Home is an important word in our place language. For most Americans, home connotes a structure or building, usually a single family house, but of course the word has broader, more expansive meaning. It is place that we like very much or love, that makes us feel secure and cozy, where we enjoy being, that replenishes, refreshes, reinvigorates us, to which we have significant attachments. Coming home is a good thing – these are places that reassure us, provide shelter and safety, where there is rest and nourishment. These are places that are familiar to us. Our larger home, beyond the narrow notion of our house, including our streets, our neighborhoods, our communities, similarly provides us with comfort, sustenance, and reassurance and equally warrants our care and commitment (Beatley 30).”

“For our house is our corner of the world... it is our first universe, a real cosmos in every sense of the word.”
~ Gaston Bachelard, The Poetics of Space
“The mystery of houses is the mystery of our mind. We move from room to room and only inhabit the present. Abandoned rooms are like abandoned thoughts. We can return to them. As the shell of a house encompasses external rooms for our body, the shell of our body encompasses the interior rooms of our thought. We rummage through the attics of our houses. The idea of house is the idea of forever.”

~ John Hejduk, Mask of Medusa
Inhabitant Connectivity

Inherent in the question of inhabitant connectivity in the home is how people actually use their homes; and then further still how that relates to what they want in a home. An assessment of both of these areas spans from the macro to micro scales and deals with an immense spectrum of memories and emotions related or applied to the house, its relationship with its site, and ultimately with the person and greater social context. The uses and wants in the house are infused by each inhabitant’s differing experiences and expectations, making the house one of the most complex of architectural designs. The house should mediate between the inherent and not so inherent uses and wants by focusing on individual inhabitant’s wellbeing.

Human Scale
The house operates on at least two definable levels, the psychological and the functional, where each affects the other. They connect the inhabitant with their home, vice versa, and in turn with the surrounding context. The human scale deals with both the psychological and functional aspects of the home. When considered, the house itself should by definition be of the human scale because the function of the house is to house inhabitants. It follows that spaces for inhabitants should be the most important hierarchically in the home. The “spatial and physical elements and their attributes are critical components in people’s relationships to settings” (Rapoport 42).

What People Want in a House
C. G. Jung wrote, “everything in the unconscious seeks outward manifestation, and the personality too desires to evolve out of its unconscious
condition and to experience it self as a whole” (VI). Clare Cooper Marcus took Jungian psychology a step further and spent twenty years doing research on the interaction between people and their domestic contexts. Her study was one of the first to touch on the emotional meaning of home; she sought to find out why people felt they way they did in their home. From over sixty individuals interviewed she concluded that “people consciously and unconsciously ‘use’ their home environment to express something about themselves” (Marcus 9). This being said, the reflection of self is a result of both conscious and subconscious choices or preferences. Witold Rybczynski expressed that “houses are like clothes” highlighting the capacity of the building to reflect the owner. Clare Cooper Marcus wrote in *House As a Mirror of Self*, that the “home fulfills many needs: a place of self-expression, a vessel of memories, a refuge from the outside world, a cocoon where we can feel nurtured and let down our guard.” As such a refuge or ‘castle,’ as English jurist Sir Edward Coke said in 1644, the house consists of a layering of complex relationships that make it a home. “Our territory is a source of security and protection from outside threats, especially at times when we are vulnerable” and as such it provides a sense of permanence (Gunter 13). The extent of the mental associations and feelings from the house for both inhabitant and guests are endless.

Houses choices are frequently based on their physical attributes and according to what kind of image or qualities they project about a person. The symbolic meaning attached to house is capitalized on by the house builder. One example of this practice is by using the inherent nature of materials to resonate with the desires of home buyers. The brick cladding speaks to permanence despite it being on just the front facade. The stone veneer speaks to solid ties to earth, solidity, and warmth.
A covered porch means welcoming and homely. The classic columns denote airs of democratic ideals, power, or colonial style charm. All these treatments support the home buyer’s desired image, while remaining symbols of home that no longer act in their utilitarian function. One can reveal a lot about themselves through their house. It can indicate whether one is “private, withdrawn and introverted or outgoing, sociable and extravert” (Gunter 128). Coupled with these basic social traits are character traits, like whether one is “conforming or trendsetting, materialistic or spiritual, self-confident or insecure” (Gunter 162).

Style is one of the most evident of the physical attributes of the house. Contemporary lifestyle and home magazines emphasize people determining what their personal ‘style’ is prior to engaging in commissioning or renovating a house. The goal being to help produce a house or space that relates to first to the inhabitant’s personal projects of self and secondly to the outsider’s view. In today’s society, styles can be indicative of “wealth or poverty, or friendliness or aloofness” (Gunter 48). The implications of house style directly relate to the choices that people make about what they want in their houses. Barrie Gunter notes that the house is expected to project the inhabitant, thus its connectivity should corollate to his or her greater financial investment. The result not such a clear relationship, instead of reflections of the individual the house inefficient space utility, unsustainable forms, and overall ill suited houses. With the expansion of house designs there has been an increase in inhabitant and site disconnectivity. Houses are a shadow of what they should be in fulfilling human needs. Barrie Gunter lists some of the key defining concepts of the home as including ‘centrality, ‘continuity’, ‘privacy’ and personality identity’ (Gunter 11). To achieve these Maslow’s needs must be met.
Abraham Maslow’s hierarchy of human needs as applied to the house. A should go beyond fulfilling the basic need of shelter and aid in fulfilling self-actualization.

Toby Israel, Some Place Like Home: Using Design Psychology to Create Ideal Places, 2003. 56.

According to Abraham Maslow’s theory of hierarchical personal development, first the physiological needs must be met. Which include the need for food, water, and air; then the needs of safety which include security, stability, protection, and order. The next step is the belonging and love needs including love, affection, and sense of belonging; then the esteem needs which include self-respect, independence, and esteem from others. The final step is self actualization, where self-fulfillment is reached. Theses steps are subconsciously sought, and may be evident in the seemingly superficial choices made in not only house style and location but also house size and finishes.

Individualization
Inhabitants create new personal connections to enrich their present culture through building or renovating their houses. When an existing structure is used, a previous dialogue is integrated and reinvigorated, making the resulting spaces that much more vibrant. That previous building need not be a monument, what is important is the retention of the personal connection and experience with space. Witold Rybczynski’s
exploration and description of his boathouse in *The Most Beautiful House* in the World is an atypical building process. Few Americans take part in the design of their houses, while fewer still in the construction process. The desire to participate stems from the human desire to make and explains in part why people personalize their homes. Acts of building, creating, and recreating add richness that is lacking in the rampant suburban home builder developments. Since middle class Americans cannot afford to commission a house tailored to their persona, they seek other outlets for self expression. Often the pursuit manifests itself in the use of surface elements and applications like lawn ornaments and paint colors. With the present state of the middle class American home, the personalization of space is often only evident in the movable objects in the home, rather than the physical fabric itself. Rapoport believes that the house does and should play a part in enhancing the inhabitant connection (46). A designer should focus on designing a house that can reflect the inhabitant and be “in modest harmony with [his or her] own nature.” Herbert J. Gans’ article *Towards a human architecture: A sociologist view of the profession*, notes that architects often have affinities for high

“We tend to judge things by what they are adjacent or near to, so the bigger houses of the last thirty years do not seem so much bigger.”

~ Sarah Susanka

*The Not so Big House*

“A home represents a great deal more than simply the place where we happen to live. Indeed a property may always remain less than a home unless we can stamp our own identity on it and ensure that it caters for the needs that characterize our psychological make-up.”

~ Barrie Gunter

*Psychology of the Home*

Jan. 2000
style forms while the public prefers ‘vernacular’ or popular styles. The difference in preference may be in part to the continual desire for forms of the familiar. Herbert Gans noted that High style are atypical and unfamiliar while popular styles are typical and familiar (qtd. in Gunter 48). This demonstrates the reason why numerous people desire familiar forms and spaces in houses. On one hand, adherence addresses inhabitant desires for permanence and the typical nostalgic associations of the home, and on the other hand it has perpetuated the current architecture that regards additive verse integrative principles. Increased exposure of high styles may breed familiarity for the American middle class, as it has abroad.

Prior to the recent recession, the market succeeded in convincing the middle class that opulence and success were equated to a large house that may or may not actually have any connection to them as an individual or inhabitant. People regard the “number of rooms, number of bedrooms and increasingly the number of bathrooms... and the structural soundness of a house” as key variables that “determine attractiveness, marketability, and price” (Gunter 19). Building companies and real estate agents emphasize these features when promoting homes to potential buyers. Unfortunately these variables, though necessary, do not address non-square foot necessities of the house. David Saville Muzzey, Professor of History at Columbia University, said circa 1929, “Our preoccupation with material success threatens to blind us to the value of the patient, honest cultivation of mind and character.” More stuff does not increase happiness. Is the house for the scale of things one owns or for the scale of the inhabitant? Shifting the focus back to the individual inhabitant, like the case studies mentioned in Shay Salamon’s Little House on a Small Planet prove this point; “they build, remodel,
redecorate, or just rethink their needs, prudently and calmly, constructing a joyful, sane life around themselves” (X). The focus is on building their social capital more than simply their economic capital. “The things you really need – air, food, sleep, sunlight, laughter - you can’t carry, at least not in any significant quantity, and you can’t store them long in a house” (Salamon 21). How one goes about getting or designing these opportunities into the house is what is important.

House Size

“In the past 150 years, the home has changed drastically. In particular the form and size of dwelling places - they reflect the changes in ownership, wealth, fashion, mobility, and technology. Homes are becoming bigger, with more space inside and more territory outside” (Gunter 11). The addition of functions beyond survival needs, like increased comfort (amenities) and security (Gunter 8) have been a major part of the house’s expansion. What was once a luxury is now considered a necessity (Pew Research Center, “Luxury of Necessity?” 2). “We have larger houses and homes with many more amenities (remarkably, about 18% of our homes are equipped with three

The rising median square Feet of detached single family residences built in the United States.

car or larger garages for instance)” (Beatley 17). In the past thirty years, the average size family has shrunk while possessions continually expand to fill the additional space.

Shay Salamon, co-founder of the Small House Society, recorded in The Not So Little House, multiple cases of people’s non-architect designed interventions across the United States and Canada. These people have implemented strategies more akin to a modern vernacular in order to maximize not only the economy of the space they own but also the social psychological returns. The projects integrate sustainable design as a way of thinking, doing, and living (Salamon). They demonstrate that in order to put the philosophy into practice, the existing market driven house model needs to be retooled. When taken by themselves, Salamon’s case studies have little more impact than the earlier ecovillages and Mike Reynolds’ Earthship work because they remain on the fringe. In order to bring the practice to scale, the innovations need to be translated into the mainstream.

The perception of how big a home actually is can be altered depending on who is compared or if the inhabitants compare themselves with how the majority of the world lives. In designer Sarah Susanka’s series of books on the “Not so Big,” she quotes a proverb that suggests if one becomes discontent with the amount of space he or she has, he or she should bring an animal into the house and after a few weeks put it out (Susanka). The result being a greater appreciation for the space one has and the house seeming much bigger. If one does as Shay Salamon suggests and stops “trying to keep up with the Joneses or find different Joneses” (5) he or she need only look as far as Denmark, where the average size house is approximately 1600 square feet (NPR). The majority of the world’s houses are a fraction the size of our 2400 square foot homes. The “Not so
Big” ideology resonates with the reductive living brought on by the recession and actually parallel Frank Lloyd Wright’s approach to the middle class house problems. With each of the Usonianians, the carport is used lieu of an enclosed garage, because according to Wright, “the modern car requires only a roof to protect them [sic] from the elements” (Pfieffer) One must re-access the needs and then pare down the spaces to economize the design. Pearl Mast, an inhabitant of one of Shay Salamon’s case studies, said “reductionism itself is no code to live by. It’s a path to that something better” (11). The measure of success should not be what inhabitants wish to have to keep up with the Joneses, but what they actually need and use. Instead of comparing life to what one wishes it to be like, why not design what one needs and make it quality. To build a glove not a warehouse (Salamon 37). The call to re-access or reform the focus of life and the house are not new. Around 1905 Charles Keeler, wrote in A Simple Home that, “…of all reforms needed in the life of the home, that of the relation of the man to his family is most pressing. Modern materialism demands of far too many men an unworthy sacrifice... A simpler standard of living will give him more time for art and culture, more time for his family, more time to live.” Right-sizing in numerous areas of consumption have occurred due to the recession, the next step should include the house.

Inhabitant discontinuity is not regulated to home builder houses alone, it is evident in high end houses like Mies Van der Rohe’s Farnsworth House. Though an excellent execution of theory, its sculptural form leaves something to be desired in the way of livability. Reduced privacy and comfort keep the house from acting completely as a home. Rybczynski decries Le Corbusier’s houses for similar issues of inhabitant disconnection in not only their room adjacencies but also their unrelated room
The Farnsworth house is such a pared down expression that humanistic qualities of comfort are only provide through the minimal furniture. Concepts of privacy and refuge are denied and even the bedroom required changes at the request of Miss Farnsworth post occupancy.

The problem is described by Sarah Susanka as wearing a bag that has plenty of space but sacrifices the necessary components of comfort and use. A ‘one size fits all’ approach fits few. The experimental 20K houses by the Rural Studio at Auburn University offer one possible means to approach sustainable design integration at low cost and at a small scale. While the houses are not for the middle class, they address the key needs of a house while also providing the opportunities for inhabitant connectivity.

Rural Studio $20K House IV
Pattern Book House
Greensboro, AL
2008 Thesis/Outreach Project

Peter Ekama. 2009.
In Mr. and Mrs. Theodore Baird’s Usonian House, Wright integrated notions of the human scale throughout the residence. The house was designed to not only fit the individuals but also provided instances of connection to the greater world around them. Children’s rooms were treated similar to master bedrooms in their connection visually and physically to the exterior. The master bedroom was often located furthest along the circulation path from the main entry. Theodore Baird wrote to Wright praising the effectiveness of his Usonian house:

Dear Mr. Wright:
...I say to you now what the house means, as daily, daily [sic]. I find new joy in it as the lovely thing it is, and this experience of growing will continue with the seasons.... I feel the house entering my consciousness more and more clearly. I never noticed before in all my life how the days lengthen and catch glimpses of the sun on the Holyoke Range which were there to be seen all the time if only one looked __ and if one lived in a house which looks out as this one does. Waking up with joy. There is the world around us, not within my own brainbox [sic]. Even sitting with my back to the south I am conscious of a direction, an opening out. and where ever the eye pauses there is the pleasure of the lines and the varied colors and textures of the lovely wood. We came to you in the first place knowing the experience of living day by day, where the walls are not barriers, where there are satisfactions for the sense in just moving from one room to another, that is more wonderful than ever hoped.... You live in our minds daily, momentarily [sic], as the creator of this. Yours, Theodore Baird

(Pfieffer 65).
As Mr. Baird expressed, “the home is also somewhere we can rest and refresh ourselves after hard and stressful day. It is a place for the renewal of physical and psychological energy” (Gunter 13). Along with their rejuvenating and even awakening of awareness, Mr. Baird’s letter demonstrates a heightening of sensations related to natural surroundings. The letter attests to the house’s capacity to enrich inhabitant lives through design. The success of the Usonian models stems, in part, from the designed progression from space to space and attention to space utility.

Wright set up guidelines for the Usonian house plan which included a big living room with as “much vista and garden coming in as we can afford, with a fireplace in it, and open bookshelves, a dining table in the alcove, benches, and living-room tables built in; a quiet rug on the floor” (Wright, “An American Architect” 174). He also designated that cooking and dining spaces should be adjacent to, if not part of, the living room. The result being a distinction between the public and private wings of the houses. Progression was enhanced in the houses with transitional spaces prior to entrance into the main living areas. The entries continue the exterior to interior progression that culminate in the open living areas. Abundant light and higher ceilings in the living areas signal their prominence. Room views and paths through rooms are frequently diagonal increasing the sense of space in small spaces. Space is maximized further by using the circulation halls as storage spaces. Additional personal storage is built into each bedroom.

The functional aspects of the house have as much to do with the physiology as the psychology of the inhabitants. The house should be scaled for human activities and interactions. Christopher Alexander and Edward T. Hall provide some of the functional data related to the human experience
in the built environment. For instance, groups of seven or more can seem like too many in one space. In order to create a comfortably sized living room one can estimate its size based on seven people each in a 2 foot circle (115). Designing a room to fit seven comfortably can eliminate the sense of a crowd while facilitating group interaction. Another means of using the human scale is by taking the upper range for full casual conversation being approximately 8 feet and using the distance to determine adjacencies, privacy, and room sizes. The Case Study Houses by KBSA paid special attention to the spacial planning so that different activities could occur in the same spaces while not conflicting with one another. A person with 20/20 vision can see details of facial expressions up to 12 feet away. People 8-9 feet apart can pass an object if they both stretch. In Japan, traditional rooms are measured based on tatami mats which measure 3 feet by 6 feet. When

<table>
<thead>
<tr>
<th>Distance</th>
<th>3” to 6”</th>
<th>soft whispers; top secret</th>
</tr>
</thead>
<tbody>
<tr>
<td>Close</td>
<td>8” to 12”</td>
<td>audible whisper; very confidential</td>
</tr>
<tr>
<td>Neutral</td>
<td>20” to 36”</td>
<td>soft voice, low volume; personal subject matter</td>
</tr>
<tr>
<td>Neutral</td>
<td>4’ 6” to 5’</td>
<td>full voice; information of non-personal matter</td>
</tr>
<tr>
<td>Public distance</td>
<td>5’ 6” to 8’</td>
<td>full voice with slight overloudness; public information for others to hear</td>
</tr>
<tr>
<td>Across the room</td>
<td>8’ to 20’</td>
<td>loud voice; talking to a group</td>
</tr>
<tr>
<td>Stretching limits of distance</td>
<td>20’ to 24’ up to 100’</td>
<td>indoors; outdoors; hailing distance, departures</td>
</tr>
</tbody>
</table>

four mats are arranged in a square there is enough space for four to sleep (Susanka 3). Adding these basic measurements to room and spatial planning will improve the functionality of the house.

The Middle Class
No person or class is ever stationary, each is always trying to take on characteristics of the upper class. Moving up in the world, includes the house, and home ownership is the first rung. “Most Americans believe they have to earn twice the median income to be solidly middle class” (Schor 78). Since the middle class continual strives to move beyond the middle, they feel that what they earn on average is just not enough. The middle class in America is a broad group of people. Professor Robert Beauregard wrote that post WWII, “to be middle-class meant more than aspiring to a college education and a white-collar job. It also meant having a family - the point of view is decidedly male-with a homemaker wife and three to four children all living together comfortably in their own home. The family was to be the center of social life” (124). The American dream has shifted and become more specific to include “owning a decent home in a safe neighborhood with a good public school, having access to affordable healthcare, saving for college and retirement, and enjoying the occasional meal out, movie, and vacation” (Jared Bernstein, Executive Director of the Middle Class task force). With an expanded concept of middle class and coinciding recession, the dream is not as accessible as it once was. The ever-increasing standard of living has naturally included larger homes and corresponding mortgages. The single-family house is about 50% larger and houses were nearly 60% more expensive (in inflation adjusted dollars) than the mid 1980s (Pew Research Center, “Inside the Middle Class” 51). Along with the increasing house size, goods and services
increased. High definition television, high speed internet, and cable or satellite subscriptions have become commonplace consumer items and as such, the costs of maintaining the accepted middle class lifestyle have increased.

Outside the house, medical care, insurance, and college education rose more sharply than inflation (Pew Research Center, “Inside the Middle Class” 25). As expenses have risen, middle class Americans have taken on more debt, often borrowing against homes that, at least until recently, had been rising rapidly in value (Pew Research Center, “Inside the Middle Class” 15). The median debt-to-income ratio for middle income adults increased from 0.45 in 1983 to 1.19 in 2004 (Pew Research Center, “Inside the Middle Class” 15). Ratios increased for upper and lower income adults but by a lesser margin (Pew Research Center, “Inside the Middle Class” 6). Using the house as equity introduces instability to something that is perceived as permanent.

Many of these same issues have caused what sociologist term the work-home crunch. Where “the demands of work are colliding with family responsibilities and placing a tremendous time squeeze on many Americans” (Gerson et al. 673) The squeeze has affected both white and blue collar workers from diverse cultural groups in America’s middle class. Home life and house utility is directly affected. Spaces originally thought essential in families’ day to day lives actually receive little use on daily and even monthly basis. With the larger mortgage costs, inhabitants must work more to make the spaces they thought they needed remain their own. Ironically, the increased workload leads to less time to enjoy the spaces they work to retain. So, while solidifying their middle class status socially, they have also undermined their individual connectivity to their house.

Center, path and domain help to define a location in context. Through an understanding of one’s location a person can understand their relationship to space.” The relationship between man and space is none other than dwelling, strictly thought and spoken” (Genius Loci). Dwelling is the basic character of being. The genius loci directly ties to one’s connection to that space.

~ Christian Norberg Schulz
Architect, Theorist
Cost

The middle class house is larger and not as efficient as it once was, or could be. The size and efficiency of the house directly relate to the functionality of the home for the inhabitant. Reducing the size of the home reduces energy demands more so than insulation does, (see Household BTU graph). Builder Jug Tarr notes that, “it doesn’t take a PhD in physics to see that energy cost is a direct correlation of cubic feet” (Salamon XII).

Cost itself is generally a matter of square feet of the envelope; if more quality is made instead of just more space, the house can start to actually contribute to the lives of its inhabitants. The early 2000s market focused on increasing house verse quality, so any savings in on-site labor were spent on space that would continue to cost more for inhabitants over their lifetime. Extra space costs more in multiple ways: to decorate, clean, maintain, and in energy to heat or cool. Builder Alex Wilson states, “it is easier to reduce the embodied energy of a house by making the house smaller than by searching for low-embodied energy materials” (Salamon XII).

Attention to cost can directly correlate to inhabitant connections to materials and spaces in the home. Investing in quality is one of Sarah Susanka’s mantras and in order to do so, the house’s overall size is reduced. She suggests that “if you have the spare change to build 5,000 s.f., cut your size in half and spend the savings on an architect, skilled craftspeople, and high-priced materials and show off the gorgeous results” (7). A smaller house offers greater value to the inhabitant from the beginning. Sarah Susanka estimates that if one spends $70 per square foot on construction, eliminating 100 square foot would save over the course of twenty-five years:

$7,000 construction

$12,000 mortgage (assuming 8% interest)
$400 maintenance (repaint every 5 years)

$200 (cleaning costs -
   1 hr/month at $10/hr plus
   supplies)

$200 insurance cost

$3,000 heating/cooling (conventional
moderately insulated house)

Drop the $100,000 mortgage to $93,000
and prepay $160/yr (cost of the last 4 items,
divided by twenty-five years) then you could
burn the mortgage two years earlier saving
$20,000 without the added cost (63).

The average monthly mortgage in the US is $800
to $1000 (Adler). To qualify for a Federal Housing
Authority loan, the amount cannot exceed 30% of
one’s annual income (FHA).

Frank Lloyd Wright said “it is necessary to
consolidate and simplify the three appurtenance
systems -- heating lighting, and sanitation. At least
this must be our economy if we are to achieve the
sense of spaciousness and vista we desire in order
to liberate the people living in the house” (Twombly
275). He continued by saying, “to give the [family]
the benefit of the advantages of the era in which
they live, many simplifications must take place”
(Twombly 276). His words remain applicable today.

The global economic meltdown demonstrates
fairly pointedly that living beyond one’s means
is not a sustainable mode of living. Instead of
providing people with their desired connections,
the market left many in foreclosure, undermining
the inherent ideas of permanence associated with
the house. The individual connection to the house
is severed when the house is valued as only an
economic investment. Developer home builder
houses are predicated on market research studies
directed at determining what people want in a
home. Since house models lag behind actual house
needs, they retain vestiges of the boom market
and have not been right sized for either present conditions or future sustainability. The recession’s reduction in standard of living, should include smaller more appropriately sized homes. By having less, one can invest in time and the intangible instead of depreciating products.
Site Connectivity

Present home builder developments lack the actual connection to historical context and exist only as partial and poor imitations of aspects of the past. The fact that the same architecture is placed indiscriminately across the nation attests to the diminishing cultural connections. People can experience the same superficial relationship with space no matter where they are in the country. In *Native to Nowhere*, Timothy Beatley bemoans the increase of areas he terms ‘non-places’. The connection to the home as an inheritance, a legacy, and a medium for transferring experience to the future has been lost to our mainstream culture. “Industrialization and the global economy have inadvertently caused uniformity and placelessness in buildings, towns, and urban landscapes” (Beatley 37). Since Americans spend 90% of our time indoors, (Susanka 77) in these non-places, the effect on human health and development is much more widespread then one could believe.

By starting with the home, where life starts, systemic non-places can be stopped. Connecting the house with the land on which it sits and the broader ecosystem (air, water, flora, fauna) so that it can contribute more positively also aids in fulfilling many of the unconscious inhabitant desires, like repose and comfort. As such, inhabitant connectivity as innately tied to site connectivity as the houses is to both occupant physical and psychological health. Studies by the US Environmental Protection Agency note that there is a growing body of evidence that indicates that the air within homes and other buildings can be more seriously polluted than the outdoor air in even the largest and most industrialized cites (Susanka 77). Increased cross ventilation and daylight not only address inhabitant needs but also

“The home is central to our existence. It is a safe haven to which we can retreat from stresses of everyday life. It provides shelter from the elements and a firm anchor that makes us feel secure. It offers a constancy in an ever changing world.”

~ Barrie Gunter
Psychology of the Home
Ryan House - Sliding door access to the exterior. Almost no integration with the exterior by way of enclosing or engaging exterior space.

connect the inhabitant with the site. Integrated sustainable strategies have a direct effect on environmental quality.

What People Want in a Site
The disconnect from our natural environment is “dramatically evident in the purchasing of a home where the greatest amount of attention is given to such things as the kind of countertops in the kitchen, the number of bathrooms and fireplaces, and the square footage of the unit. A prospective homebuyer is much less likely to be concerned about or ask about such place-connecting things as where the parcel drains to, where in the local watershed the home lies, from which direction the prevailing winds blow, and the extent to which native trees, plants, and wildlife can be found on the site” (Beatley 13).

“A clear majority (72%) of potential purchasers of new houses, said that their main consideration was a ‘nice area’ [referring to the neighborhood] (Gunter 20). This nice neighborhood is located near but not actually in a metropolitan area. People desire the American dream of a detached,
A “real place... recognizes and emphasizes the unique qualities of the community; values complexity, richness, and layering of history, environment, and architecture.”

~ Timothy Beatley
Native to Nowhere

owner-occupied, single-family house, located in a natural setting, yet near amenities. “More then half (55%) identified a quiet location, with substantial minorities (over 40%) mentioning the wish to be close to amenities, the amount of space around the house and security” (Gunter 20). Places away from the city’s impersonality, congestion and noise (Beauregard 76). Families with children seek areas further from city center because the perception that the quality of the neighborhood would be better and more conducive to the raising of children (Gunter 21). These site preferences relate to the previously mentioned human needs for connection to nature, and its corresponding affects on human psyche. People prefer places with vegetation and water as opposed to places without them. People do not like man-made nuisance objects like wires, poles, and cars (Gunter 23). These added elements ruin the feeling and look of natural places. The same reason is behind people’s desire to have greater tree density, but not to the point that it is a safety concern. These desires are the manifestation of the inhabitants’ subconscious need for nature where they live.

Additional questions that go beyond amenities and proximity of the property to the stores or parking, include: Whether the property has the potential to cater to his or her personal privacy needs, or his or her needs to socialize, or his or her needs to show off personal identity in idiosyncratic ways. “Does the property have a personality that will match their own?” (Gunter 10). Developer home builders manage by offering a series of similar models and leave the inhabitants to add to or alter them post occupancy. Designs are tailored to reach as many markets as possible and not focused on specific individuals. The diminished responsiveness to the individual in effort to cater to the general market creates an architecture of nowhere and no one. The question of if home and...
site match personality explains why neighborhoods where properties all look the same tend to be less popular; people want the house to be different from other people’s in the neighborhood (Gunter 23). People desire a connection to nature and to address that need, valuation must extend beyond the countertop material and number of bathrooms. Questions that address where prevailing winds comes from or what direction south is, should be broached at the beginning of the process.

Design can be aided by identifying some of the characteristics of inhabitants in exurban regions. Clare Cooper Marcus described some of the design implications necessary to address the inhabitant’s need for nature by saying that the “settings use near-home spaces as a backdrop for the unit and a buffer between the unit and its neighbors. The appearance and spaciousness of near-home spaces, as seen from the unit, are therefore important. Out-of-town settings are effectively removed (although not necessarily distant) from the hustle and bustle of city life” (Marcus 218-219). She continues in describing the what is to many the American ideal. Single family detached houses where one has privacy and can enjoy the company of friends. Where there is the chance for introspection; “a slower pace, a simpler and more direct way of life, or the natural order” (Marcus 219). Addressing the pace of life with nature’s calming capacity demonstrates yet another need for people’s connection to it. The present suburban life has many similar elements by default. Life is less communal and distances to “other people, stores, services, and cultural and educational facilities” (Marcus 219) is of secondary importance compared to connection to family and self. While this focus is present in existing suburbs, it is not a designed resultant, therefore the connections vary in their success. In contrast, a house that facilitates a human centric
lifestyle reformats the suburban model with the primary focus on connection to inhabitant, thereby enriching his or her life.

Human Development
The removal of nature and replacement with a manicured standard design approach stunts a person’s development. “We are social creatures, to be sure, but we are also creatures that need contact with nature and other forms of life” (Marcus 62). If the places do not exist, people manifest their need through other means. Just as people desire to have houses that mirror themselves, people desire sites that have some aspects of nature. Gardening is one utilitarian manifestation of people’s attraction to plants and greenery, which has been described as being ‘almost primordial’ (Gunter 23). “Residents in American communities today have lost... much of their visceral connectedness to the seasons and rhythms of nature” (Spector 2000). Richard Louv points out in Last Child in the Woods that people, especially children, need contact with nature for their development physically, mentally, and emotionally. Toby Israel’s research argues that positive place associations affects future environmental choices; if children do not have experiences in places that enrich their lives, the baseline for their future space associations is lower. Evidence of the decline is seen in the baby boomer generation’s children who grew up mainly in suburbia. To that generation, suburban patterns are the baseline of acceptable design. If houses are designed to meet the declining baseline, instead of pushing the connectivity with inhabitant and site, the future of activating residential space is grim. The present generation’s increasingly unarticulated desires will be increasingly more difficult to decipher, as they become accustom to the mediocre baseline.
Timothy Beatley notes that in being native to somewhere there are qualities that directly relate to the site development approach. Places that fulfill connective needs develop in ways that understand the natural environments, ecosystems, and landscapes in which the community is situated, and strives to protect, nurture, and restore them (even in dense cities) and to bring nature into intimate contact with residents (Beatley 23). Wright and Randy Brown in his eco-modern development minimized their intrusions to the site by maintaining the majority of the lots in their original states. During site development, Wright limited excavation by setting the houses on crushed stone beds making them essentially floating foundations. By reducing impact the richness of the history of place remains intact and contributes to future human development. In contrast, each home builder development site is made into a blank slate. Trees are removed, soil is regraded, and sod is applied to hide the scars. Property lines are established with house orientation based on the road instead of the sun. If the site was farmland, the site no longer relates to its history of decades prior. If it was open field or forest the ecosystem is either entirely removed

“For single-family houses, small is beautiful in terms of environmental performance.”
~ Shay Salamon
Little House on a Small Planet
or reduced to the point of sterility. Each new activity is fixed. No longer are chance means of exploration and discovery present or encouraged. The completely manicured lawn leaves little room for a child to romp, play with sticks, hide in weeds, pick flowers, dig holes, throw rocks, or learn from the environment around them. A child engages in more play and more varied play in areas with trees and grass than areas without them (Gunter 31). If there is a place to play, it is often so designed that the activities are already determined, leaving the child with little need to imagine, design, or create new ways of experiencing his world. The suburban standard practice has separated each child into his or her own specific and, arguably, sterile backyard. The house has been standardized and generalized to each person without accounting for synergistic aspects of site and home.

In The Oregon Experience, Christopher Alexander wrote that,

“lump sum development is based on the idea of replacement. Piecemeal growth is based on the idea of repair. Since replacement means consumption of resources, while repair means conservation of resources, it is easy to see that piecemeal growth is the sounder of the two from an ecological point of view. But there are even more practical differences. Large-lump development is based on the fallacy that it is possible to build perfect buildings. Piecemeal growth is based on the healthier and more realistic view that mistakes are inevitable. Unless money is available for repairing these mistakes, every building, once built, is condemned to be, to some extent, unworkable. Piecemeal growth is based on the assumption that adaptation between buildings and their users is necessarily a slow and continuous business which cannot,
under any circumstances, be achieved in a single leap” (77-78).

Place is a result of a multitude of layers that when taken as a whole act synergistically. When one homogenizes space either through large scale projects of mediocre styles, or by stereotyping regions based on singular themes, layers are reduced. Reduced layers reduce the sense of authenticity and sense of place.

A retention of site history lends itself to the creation of at least one additional layer and therefore has the capacity to create place. These succeed when the designs “make these histories visible and alive and prescient to inhabitants” (Beatley 23). Regionalism, historic preservation, and adaptive reuse are a few of the architectural responses that attempt to address the desire for personal interaction with land and space. Regional architecture specifically responds to the issues and context of specific geographic regions. This type sets up new connections to space. Historic preservation and adaptive reuse retain aspects of the previous relationships to space, connecting to the associated memories, thus adding an additional layer of interpretation and interaction capacity. Timothy Beatley said that “our memories are wrapped up in [places]” (25). This relates to David Yencken’s definitions of places; he says, “spaces are generic and non specific; places are immediate, known and lived in. We move through spaces, we stop in and are directly involved with places” (qtd. in Beatley 11). “Place... refers to space that has been given meaning through personal, group, or cultural processes... [places] may vary in several ways—scale or size and scope, tangible versus symbolic, known and experienced versus unknown or not experienced” (Setha Low and Irwin Atman, 1992, 5). The definition is explicit about the personal and tangible connections to places. The site serves as the place for the house
and the house, in turn serves as the place for the inhabitant.

Howard Frumkin notes that “there are discernible and demonstrable physiological and emotional benefits from exposure to nature (qtd. in Beatley 9).” Healthier patterns of social behavior are associated with individuals living near areas of greenery and vegetation (Gunter 31). With access comes utility, with utility numerous health benefits. Adult activity mirrors child activity, demonstrating that both prefer natural scenes to artificial (Gunter 23). Other notable benefits are catalogued by the non-profit Project EverGreen, in the form of referenced studies by and articles by professionals and universities. For instance, green increases the appeal of places. “Psychologist Rachel Kaplan found trees, well-landscaped grounds and places for taking walks to be among the most important factors considered when individuals chose a place to live” (Project EverGreen). With access comes more “regular physical activity in our daily lives, it is the greatest weapon we have against the onset of age-related disease and disability” (Beatley 6). This relates to other aspects of ‘places’, they are designed to facilitate active lives and lifestyles, foster social interaction and development of deep community and interpersonal ties and commitments, and minimize dependence on the automobile (Beatley 23).

Designing and maintaining houses so the outside is as desirable and functional as the interior has a broader affect on inhabitants. The research firm Roper ASW’s survey suggests a trend to “local nesting” suggesting individuals and families are spending more time closer to home, are more physically present in their neighborhoods, and have a greater sense of wanting relationships with neighbors and community” (Beatley 22).
Sustainability

“We develop subdivisions, commercial strip malls, and office complexes that ignore the intrinsic physical features and qualities of place. We ignore the topography, the existing vegetation patterns, the native flora and fauna, and the natural breezes and micro-climatic conditions that are so important in shaping and defining a location” (Beatley 11). “40% of all the raw materials humans consume are used in construction. Most trees we cut become buildings. ½ of the copper we mine becomes wires and pipe inside these buildings. Building an average house adds seven tons of waste to the landfill” (World Watch Institute). New home construction is arguable the single greatest threat to endangered species: even in areas where human population is on the decline, animals and plants are more threatened each day due to the construction of new houses (Susanka 2).

Jianguo Liu, a biologist from the University of Michigan wrote in Nature Magazine regarding the shrinking size of households and how it contributes to higher energy demands. He studied 76 hotspots around the world and linked extinction linked to the adoption of the present suburban development pattern. “Even when population size declined, the number of households increased substantially.” Many of the world’s biodiversity hotspots are under threat because people no longer live in such large family groups. The trend turns out to be even more damaging to the environment than continuing population growth. According to UN figures for 141 countries, more than half the increase in the number of households between 1985 and 2000 was due to people shifting from larger households to smaller ones, rather than population growth. If house sizes increases, resource use in buildings goes up, more land is occupied, there is more impermeable surface resulting in more stormwater runoff, construction costs rise, and we use more
energy. Even in countries where populations are falling, the average number of people living under one roof is shrinking faster, pushing up demand for houses and apartments. Jianguo Liu, and his colleagues at Stanford University in California found that if the trend continues it will mean an extra 233 million households by 2015 even if there is no overall population growth (Nature, DOI:10.1038/nature01359). Reducing the size of the American middle class home paired with a minimized impact site approach would increase the amount of untouched habitat and therefore have greater opportunity for inhabitant’s connection with nature.

Sustainable design strategies are the means to tie the site, inhabitant, and house together. To connect with the site one must first address site orientation. Programmatic organization, passive systems, and many material choices depend on the building orientation. Together, they affect the interior and exterior environment of the house. Sustainability goes beyond the ‘green house’ connotations that often conjure images of bamboo and solar panels, it functions as an integrated and influencing part of the house and inhabitant’s life.

All bedroom spaces and major living spaces should have visual access to the exterior to connect not only inhabitant to the surrounding land but also the house’s function with the outside environment. Situating living spaces adjacent to the exterior makes the interior feel larger, gain daylight, and thermal gain. South facing glazing serves multiple functions when thermal mass is included. The Usonians used their concrete floor slabs as thermal mass predominantly during the winter. The result is a radiantly warm floor to contribute to inhabitant comfort. Eaves should be designed to shade interior spaces for the majority of cooling degree days. Non-viewing ventilation windows on the north side of a house aid with stack or cross ventilation. Casement and hopper style windows aid in
ventilation as well. Indoor air quality directly affects inhabitant health. Proper ventilation eliminates mold and other issues. The more natural systems utilized the less the reliance on mechanical systems and therefore energy. Energy savings translates to a more affordable house lifecycles.

Lighting also has an immense affect on human physiology and psychology. Windows placed to achieve bilateral lighting address Alexander’s pattern language and also aid in cross ventilating spaces. The sun’s radiant heat provides thermal comfort. The sun also stimulates the production of Vitamin D and endorphins that lift moods.

The landscape can play a large role in experientially connecting the individual to house and site. The CSH program planted low maintenance native exterior plants as seasonally shading and decoration (McCoy 4) and Randy Brown’s houses integrated drought resistant green roofs to reduce runoff. Plantings can integrate the house with the site and can be used as acoustic, visual, or wind breaks. Vegetation helps maintain cooler air temperatures through transpiration, and if placed inside they can help maintain indoor air quality. Depending on the type of plants, the scents and sounds can add additional layers of experiential connection to the site for inhabitants.

Earth berms are another simple strategy to maximize the thermal mass of the earth to insulate the house and take advantage of constant temperature of the soil. Burying a portion of the house also provides an underground location for a cistern. Placing the cistern underground prevents freezing, blocks UV penetration and keeps captured water at a constant temperature (Gould). Rainwater, with adequate supply, could meet the need for many uses of water in and around the house. Bathing and laundry, toilet flushing, and irrigation require no treatment (MEEB 1036).
A well structured site is important because it allows, as Jacques Herzog said, “residents to establish a defensible space around their property, protect their privacy and security and develop their property in a way that enables them to imprint their own personality on where they live” (qtd. in Gunter 98). Passive design connects the inhabitant and house with its surrounds. Cross ventilation, night flush cooling, stack effect cooling, and thermal mass are just a few of the means that require inhabitant activity to regulate temperatures thus directly connecting them with the fluctuations of the house site. There are few successful integrations of sustainable design in the mainstream housing market. Sustainable design integration offers houses that are functional and remove the excesses of recent years. Increased efficiency is better for the inhabitant. In a broader sense the reduction of energy necessary to do these functions provides a better site environment or the inhabitant and their community.

“Reconnecting to people and landscapes at the local level and having a better understanding of the built and natural surroundings in which we live will result in better, more enjoyable, healthier, and more fulfilling lives. Meaningful lives require unique and particular places... Without intimate contact with real places, there is little chance that the loss of environments and the practice of unsustainable patterns of consumption and resource exploitation will be reversed (Beatley 3).”

Returning to a small efficient housing model reduces life excesses that have become paramount in modern society. Space within and around the house should serve multiple functions and thereby aid in returning the family to an efficient community share based system.
Amos Rapoport argues one needs to understand the relationship between the inhabitant and culture to design for that inhabitant (45). The standard house design practices deviate from traditional architecture because they are not designed for specific users or societies. Designers have lost touch with the values, preferences, and needs of their clients. The role of architecture must shift to problem comprehension before problem solving to regain non-superficial connections to building users. The cultural responsiveness of architecture depends on its connection to the people.

In this thesis, it was necessary first to describe the types of connectivity and then understand their implications on design. The premise being that increased connectivity will provide greater depth to the residential design experience so that lives of inhabitants are enriched. Depth is achieve naturally through the layering of responses. By first dividing connectivity into two categories of inhabitant and site, the research could begin to specialize on each area. In addition to these research based definitions, precedent studies were undertaken to determine strategies for implementation. Principles both organizational and experiential were selected from the precedent analysis. Many of these were coinciding and synergetic which led to their definition in four principles. The four principles are then applied to four prototypical house plans. The plans were then revised based on how well they exemplified the selected principles.

Precedents
Four precedent types were selected and three houses within each type. Three of Frank Lloyd Wright’s Usonian Houses: the Affleck house, the
Baird house, and the Lewis house. The second type was the CSH#23 Triad project by Killingsworth, Brady, Smith Associates (KBSA) which includes Houses A, B, and C. The third type was three developer home builder models by Ryan Homes. The fourth and final precedent type was three eco-modern residences by Randy Brown. The four house types were chosen based on their aim to address the middle class house for the age in which they were produced.

Each house was reviewed to compare not only site and inhabitant response but also its surrounding context and design principles. The organizational structure of each of the house types was studied with justified access graphs, sustainable strategies, public/private mediators and relationships, views, circulation hierarchies and paths, formal massing, and site orientation among others. Justified access graphs are typically utilized to understand the influence that culture has on the plan and the general societal importance of spaces. They also help to explain adjacencies, and access paths aside from the typical plan graphic.

The precedents themselves reflect a common thread of influence stemming from Olmsted and Wright. The dashed lines reflect indirect influences evident in both formal and technical strategies employed in the houses. Many of the architects that would later lay the foundation for the Case Study Program worked for apprentices of Wright. The modern ideas Wright began dealing with in the Usonian like the open plan and prefabricated construction are just a few of the concepts that carried through. The affects of the Case Study House program on the American modern house in turn have carried through to Randy Brown’s work and via his partner. The affects on the Ryan Home are less evident, though the open floor plan has gain popularity again, as well as access to the outside from the main living areas.
Many of the architects involved throughout the program either worked for Frank Lloyd Wright or were noticeably influenced by his work. Their connections to both development houses like the Ryan Homes collection and Architect Randy Brown’s Hidden Creek work help to explain many of the organizational and functional principles in construction and aesthetic decisions.

Peter Ekama, 2010.
The Usonians presented a new house type with a sense of human scale, an honest use of materials, a liberation of the space within, and a new approach to the construction process. Usonian house ‘tadpole’ plans are derived from the Prairie houses’ pinwheel and traded the series of rooms for open space. The three houses are a representative of not only the size but also the organization of the Usonian houses.

Unlike suburban developments, the Usonians were not too distant from the city, and were situated in pockets instead of promenades. While remaining separate and distinct private residences,
gradients of privacy were used to extend the houses beyond their envelopes. The gradient created a progression to the entry, from interior to exterior, and vise versa. The gradual transitions connected the Usonians with their sites and the people that moved along the paths. Wright formally integrated the Usonian houses with their sites, by varying heights and extending the living spaces beyond the enclosed area.

The public and private distinctions of ownership with the Affleck Usonian reflect the emphasis on communal space as well as the claiming of exterior adjacent spaces for utility.
Usonian houses were typically positioned near the edge of lots, freeing the rest of the site for garden and yard space. The positioning also insulates the site from outside views and sounds.

The Lewis House’s living quarters were raised above the carport level as a forerunner of the split level ranch house. The raised rooms solved two site conditions; the damp riverside ground and enhanced views to the surrounding land. When second levels exist in the Usonians, vertical voids link the floors. In the case of the Lewis house, the split level separated the private sleeping wing and the more public living spaces.

Lewis House - Aerial

Lake County Auditor. Lake County Tax Parcel Map. 2009.

Lewis House -
public to private
yellow to red gradation

Peter Ekama, 2010.
The public to private transition from outside to inside branches from the main circulation path, with rooms furthest away being the most private. The CSH houses are all three bedroom and two bathroom designs within dense suburban lots. The result is that the houses are more inwardly focused than the other Usonians. Many of the transitional strategies, like overhangs and level changes are used in the Usonians are used in the CSH#23 Triad.

KBSA paid special attention to maintaining a mixture of cross-axial and axial views from room entry points to the exterior. The interplay of openings provide views from within the house,
across the enclosed spaces and beyond, enhancing the feeling of distance, making the house appear much larger than reality. Private gardens and courtyard spaces within and behind the houses are directly adjacent and accessible from the house. Similar strategies are used in the Usonians and the contemporary Randy Brown houses.

The Case Study House program goals were to create a model low cost home for a nuclear family using standard industrial materials, to promote the idea of modernity, to include contemporary forms and technologies in the house as well as the interior space and furnishings. Leisure spaces were

CSH #23 Triad House B

Elizabeth Smith, Case Study Houses, 2002.

CSH #23 Triad House A

Peter Ekama, 2010.
joined to increase family connectivity. The hobby areas of both parents were joined to preserve the relationship. The end products “demonstrated that a good house can be of cheap materials; outdoor spaces are as much a part of design as enclosed space; a dining room is less necessary than two baths and large glass areas; a house should be turned away from the street toward a private garden at the back, etc” (McCoy 4).

The territory diagram defines the public to private transition on the inter-house scale. Cases where the hierarchy is clearer provide more opportunities for inhabitant connection.
The justified access diagrams provide another means to understand spacial relationships within the home based on a sequential path through each space. The amount of integration relates to the number of connections. The depth relates to the number of rooms or spaces prior to the final space. The inclusion of exterior rooms is very important.

From outside

From deepest space: bedroom

More integrated due to presence of exterior
carport is isolated similar to restrooms

From livingroom

Exterior presence doesn't change the amount of integration
Randy Brown makes use of screening walls to direct views to nature. In the case of the Usonians, the major access views and access points to the exterior on the south. The plan effectively places the mass of the house between the road and the remainder of the site while allowing its southern facade to remain permeable for advantageous solar gain. The house serves as a mediator that extends in both directions to transition between public and private. In Randy Brown’s eco-modern homes the houses mediate between the street and the private side of the house. The transition is more abrupt and the houses are not always oriented for solar
gain. In the case of the Crabapple house walls of glass provide views northwest to trees beyond. A circulation zone on the road side of the house provides a buffer similarly to the Usonian houses. Of the three speculative houses built at Hidden Creek, Crabapple was the first to be sold.

Ryan Homes markets with a decidedly different approach. They target the broad middle class through numerous surveys of potential customers. “The first time buyer, the move up buyer, the empty nester/move down buyer, buyers of all ages and stages of life can find exactly what they are looking for in a Ryan Home” (Ryan
Homes). The market research provides their direction in their choice of home styles, floorplans, hardware, and finishes. Additional flexibility is included with minor floorplan additions and layouts, energy star appliances, low-e glazing, and house lot. Ryan emphasizes the ease of the process and strikes a balance through its sheer number of plans, slight alterations, and finish choices. Their product’s success is in its streamlined process and built in economies of scale. They address various family types, with general non-specificity.
Principles

Choices between the numerous options in design and construction should be governed by overriding principles that, not only maintain but also enrich inhabitant wellbeing as central to the purpose of producing the home.

The precedents provided a variety of principles for inhabitants and site connectivity related to the middle class American house. Of the numerous strategies, four were chosen to implement in the thesis design. The four are: progression, buffer zone, nature connection, and reductionism. The principles act in synergy making implementation and changes within one evident in the success of the other.

Progression

Progression refers to the movement of the inhabitant and guest in to and through the house. Innate in this consideration are the signs necessary for navigation and comfort, notions of public and private realms, permeability, and perceptions of ownership. These aspects influence the progression as much as the intimacy of places and the relative human scale. Compression and release as well as prospect and refuge are two techniques
often applied to address progression. Progression also ties in with creating and maintaining a connection with nature by meditating the transition from interior to exterior.

Both the Usonian and the CSH Program set the carport off to the side as an ancillary unit instead of the primary entry point. Thereby emphasizing the house’s prominence and signaling the point of entry. The entrances to the Usonian houses are rarely directly visible from the street. Windows on the road side of the house are minimized to provide privacy and to insulate the house from road noise. The house rarely addresses the street formally, opting instead to be introverted on the public side. Since their original construction, surrounding lots have been developed, yet most Usonians retain their views to nature on the majority of their sites.

**Buffer Zone**
The buffer zone is utilized in the designs to aid in the sense of progression and elongate the entry portion. The buffer zone insulates the living spaces with the service spaces providing additional depth of travel to arrive at the more sacred guarded or private spaces within. The buffer zone also addresses the environmental considerations by reducing the non-viewing glazing on the north side of each house. Since the services are located to the North, the cooler end of the house without direct gain from the sun, remains more enclosed. The clear distinction between the buffer and the remainder of the house provides an ordering logic to each plan. Services are consolidated into the buffer zones, reducing cost of construction and leaves the southern exposed side of the house for living areas. This directly ties into the nature connection.
Nature Connection

The principle of nature connection refers to passive sustainable design strategies, visual access to vistas from all living spaces, physical access to exterior spaces from primary living areas, and a corresponding reorganized program and adjacencies. Sustainable design is inherent in planning.

Wright as a rule for the Usonians reduced materials and increase use of local materials. To the same end, he attempted inhabitant built houses which were only moderately successful. Wright revealed materials to coincide with his reductive design approach. The wood was not painted, the brick was left exposed, and the same system outside as inside. The use of the same material inside and outside created some ambiguity between where room began and ended. They also reduced the overall amount of material used in construction.

The concerted effort to reduce is evident in the flat roofs, their assemblies, the carport, the foundation and the planning grid that organized them all. Through simplification, at least in his opinion, to construction methods, Wright reduced or eliminate field labor, using less, yet achieving much more by enhancing the beauty of the site.
For the Usonians, the desire to maximize garden space was derived from the depression era... now that we have an abundance of ‘food’ we no longer consider the rear part of the house the garden but one based on recreation and entertainment. The CSH also often portrayed a garden space as well as a place to dry laundry, both of which demonstrate a more ‘down-to-earth’ approach that utilizes nature’s free services. The direct connection of activities ties the inhabitant with the site. Between enclosed and semi-enclosed space loggias extend overhead effectively extending the perception of space while providing some shading. In other instances the solid wall is removed to extend the space. The CSH used terraces to open to the exterior and provide very physical inhabitable designed space beyond the enclosure of the home. This also assist with the progression of individuals in to and through the houses. Within CSH#23 the interplay of solid and void created large openings to the outside which provided the visual connection to the exterior and enlivened space with dynamic lighting with which the inhabitant interacts.

The Case Study Houses’ relationships with one another was achieved through careful siting of the houses and the use of the same materials palette. Sea Ranch utilized a similar method to relate proximal buildings. Randy Brown subdivided a lot into 12 lots using the Planned Unit Development (PUD) in existing code. He had to take on a similar selective approach in siting the houses. Due to the density of the project, the houses were all in close proximity to one another so a concerted effort was made to direct views toward nature instead of other houses. Brown preserved over half the site and minimized the removal of trees and soil erosion into the stream that gave the development its name. This approach countered the present zoning
code driven developments, where “all the design matters are supposedly settled, and there has been little intelligent debate about them for years” (Kunstler 114). Brown’s approach, reignited that debate at Hidden Creek in Omaha, NE. Though the progression sequence was truncated in the eco-modern homes, it was better than Ryan Homes developments which demonstrate an approach that shifted away from progression. Randy Brown maintained mediocre nature connections while Ryan Homes provided even less opportunity.

Ryan Homes architects maximized the space of each layout while retaining their defined

Affleck House - buffer zone

Peter Ekama 2009.
levels of quality which related directly to monetary value. Ryan Homes construction managers met with clients prior to and during construction. An integrated house mortgage company was available to clients should they choose to use it. Ryan Homes cited their “unparalleled customer service, innovative, award-winning designs, quality construction, affordable prices and unique communities in prime locations,” as reasons for their success. “Nearly 40% of the homes Ryan Homes sells are a direct result of customer referrals” (Ryan Homes).

Ryan Homes zones plans to be based on room function verse multiple uses. The open living and dining areas are the closest spaces to multifunctional. Overall, the house lacks contrast in spacial qualities necessary to provide connectivity with the inhabitant. Clerestories, ceiling heights, and respites are addressed on the surface through hard line decisions. With this approach, corridors and stair are means to an end not multifunctional.

The goal leans to creating the most space for the cost of the house, hence the unfinished basement, and other features that make the plan larger in order to address client desires. Cost is somewhat accounted for in the ease of construction, which comes from familiarity of the home builder’s models. Each model is stick built and uses modular stairs, factory trusses, and punched window placements. The wall assembly is a layered system that parallels the approach to the remainder of the house’s decor and presentation. The outer material is emphasized, because its connotations to the areas of design psychology previously discussed. They are applications to evoke nostalgic references to past ‘home’ concepts. The practice is comparable to the use of veneer instead of a solid wood for furniture. While the veneer appears to be solid it lacks the durability of the solid built furniture. People prefer solid
built furniture to veneer finishes when given the choice. The house takes the scale of application to a greater level. When applied to the house, it addresses the basic solidity, durability, and authenticity of symbol to actual functions of the house.

**Reductionism**

Reductionism speaks to the general approach of reducing the enclosed footprint of the house to reduce the cost of construction and make it available to the middle class American, while also enhancing or creating the necessary connections for inhabitant well-being and development.

On the more extreme side, housing that is compact leaves no room for the extraneous things that often get in the way of life. Less excess space then helps get rid of the ‘out of sight, out of mind’ attitude, and therefore the excess things in life. Shifting American consumerism from product based to things in life that actually matter, the things people wish they had spent more time on while lying on their deathbeds, family and relationships for instance, begins to actually enrich the life of inhabitants beyond the basic realm of design.

Taking reductionism too far can also be detrimental to the built environment. Spaces based solely on efficiency are devoid of the inhabitant’s personal interaction and influence. As a result, cultural richness is sacrificed and personal connection to place is lessened. A small house of and by itself is not sufficient, the home must also address physiological needs. A bare bones building does not address the innate human needs of comfort and repose. The small home must be utilitarian yet poetic; phenomenological yet functional; solid yet adaptable. The small house allows for a greater attention to the details of space, details that multiple the functionality of space beyond the bounds of enclosure, and evoke
subconscious and conscious affinity to spaces. A multi-use approach to space instead of specific use. Applying a multi-use approach conserves space and materials, and therefore cost. Randy Brown chose an 18’ module to coincide with the length of joist spans, thereby reducing material usage and economizing the designs. The CSH acted similarly by using existing components in a modular fashion. A project that informs the present house design with Usonian, or CSH principles will make tremendous strides to improving the built environment for the inhabitant.

Efficiency in material utility can be achieved in timber framing according to Gene Logsdon who reports that “the average life of a conventionally built stud house is about 75 years while timber frame life is at least 300 years, and some over 1,000 years old” (Logsdon 7). Timber framing also has a better fire rating. Other material efficiencies should be explored in future iterations of this thesis. Smaller houses means relative density can increase or more natural elements can be integrated among houses to fulfill necessary aspects of inhabitant psychological wellbeing.

**Inhabitant Connectivity**

Of the precedents studied, the Usonian and the Case Study house exhibit the greatest adherence to inhabitant connectivity. Randy Brown’s houses and the Ryan homes contain other minor elements that deal with the inhabitant progression in, to, and through the house. One reason Wright was so successful in focusing the house to the individual was his approach. Sarah Susanka articulates a very similar position and modifies it with a series of questions. She says you have to start by “choosing what you need requires whittling away the excess to discover your essence. What do you want to be? What do you need to have, or not have, so you can be that? Where do you really live?” (25).
While Wright designed his modest houses for a moderate cost for the typical couples and families of the time, the new house prototype must address that shifted role of women. For Wright, the house was the woman’s dominion with the kitchen as her vantage point to observe the rest of the family and run the house (Twombly 282). The new kitchen and spaces previous regulated to the house wife need to be viewed more as communal or shared areas for the contemporary family. In the CSH, Killingworth, BSA zoned open plan living space to create simultaneous activities of isolation and socialization, these allow for more active dynamic familial space and more efficient space utility.

The Usonian utilized a zoned plan to maximize spaciousness. A kitchen service core consolidated services and was in a separate zone than the bedroom wing. To increase sense of space and progression through the houses, views to the exterior were set up off axis, glimpses into space beyond were facilitated to enhance the feeling of prospect and refuge which aided also in the journey through the building and breaking the box. Another very evident strategy that Wright used was compression and release, first evident on the exterior entry. The entry typically contained canopies or carports that extend to the exterior and partially enclose outside space. The cantilevered planes connected the house with space beyond and nature beyond. Wright decompartmentalized the living spaces and used open planning and built in storage to free up floor space. To prevent the open plan from being too regular the form includes nooks and shifts to allow for varied uses. Wright touted that the answers were “all in the plan.” Wright exploited the plan to achieve the sense of spaciousness and vistas for the inhabitants. The modern and fluid layout of space assists with some of the spacial nature that makes it feel larger and allowed for flexible...
utility. The Case Study houses separated public and private spaces slightly different than Wright. Spaces are still zones to allow multiple functions at once. The zoning is also based on times of utility and separation into day and night spaces.

The Usonian and Case Study Houses each express individuality and overall demonstrated a greater density of functions. Wright consolidated and simplified heating, lighting, and sanitation, again another means to reduce material usage and by connection, cost to make them accessible to the middle class. Rooms received the same consolidation treatment and had bunk beds instead of an additional room. Future rooms could be added to the ‘tail’ of the tadpole shaped plan organization.

Wright used radiant heat, as a means to connect with inhabitant comfort while also remaining true to his minimalist approach. Radiant heat is more comfortable because it lacks drafts, dryness, and other issues related with forced air. Radiant acts as a background system that can meld with normal inhabitant activities.
Design

The American middle class needs access to buildings that retain and enhance connects to inhabitants, the site, and community and thereby enrich occupant life. These are the things that the new hybrid house model should include for the wellbeing of residents and overall efficiency and usability. The developer home builder model is the most effective means to communicate changes to the expansive middle class. Each year, nearly 60% of houses are built by developer home builders (NAHB). Replacing developer models with updated templates and balanced design principles would improve the new housing stock for at least the next thirty years. The present developer housing paradigm stands to benefit from the integration of architecturally informed models.

Site Selection

The site is located in Paris Township in Northeast, Ohio. Paris township is in the unincorporated portion of Stark County. Since the town square of Paris, Ohio is located within two miles of the site, concept associated with the small town are ever present when considering the site. Howard Kunstler says the small town evokes a “whole menu of human values ... an agreeable scale of human enterprise, tranquility, public safety, proximity of neighbors and markets, nearness to authentic countryside, and permanence” (Kunstler). House designs must respond to the site both functionally and formally. The precedent studies provide a sampling of many of the techniques capable of connecting a house with its site.

The median household income in 2007 of Paris Township was $42,779 (citydata.com). The median for Ohio was $46,597. The median price of homes (both existing and new construction) in Ohio

That every house should have its garden and should be so placed and planned that all its rooms should be flooded with light and sunshine, unblocked by other houses or by its own projections, were the main ideals. It was necessary to break away from the customary type of street with its endless rows of houses, cramped in frontage, hideous in appearance from the street, and squalid in the congestion of its back projections and its yards.

~ Raymond Unwin
FRIBA
for 2007 was $175,406 (citydata.com). In Paris Township, the majority of the housing stock is over 100 years old. The half a dozen new houses built in the last decade in the region exceeded $200,000.

The site along State Route 172 complements the existing village while remaining distinct from the stigma of the ecovillage. The previously developed residential site in Paris Township offers the opportunity to add to an existing series of settlements while defining a more encompassing site and house approach. This allows for the layering of history and added connectivity to achieve Beatley’s definition of ‘place.’ It also fulfills Kunstler’s expectation of a new building “to add value and richness to this community (Kunstler 147).”

The Stark County Subdivision Regulation states in section 510.1 Natural Land Use and Function that “subdivisions should be planned to take advantage of the topography of the land to economize in the construction of drainage facilities, to reduce the amount of grading, and to minimize destruction of trees and topsoil. Due consideration should be given to preserving historical and outstanding natural features.” These broad approaches when actually implemented parallel quite closely with the aims of the three designer led precedents.

The exurbanites during Wright’s time consisted of the middle class and lower middle class (Frampton 186), today the same group of people seek suburban locals. Gauging the success of the implementation of the principles in the design is heavily based on how an inhabitant would actually interact with the space. Since full-scale experimentation is not feasible investigations in drawing and models will be carried out, and compared against the successes of the precedents and theory.
Site Progression - heading east
Site Progression - second story hallway House 2
Building Section - House 2

Site Plan - House first floor plans and preliminary grading conjecture

Building Section - House 4
Conclusion
A return to a small house concept that integrates present technologies and living trends will help to provide the necessary amenities without the waste of space and inefficiency. The building must first be build to serve as a prototype for the housing market. This project addresses sustainable design and the lack of meaningful architecture for the working class populace. In simplifying and consolidating the necessities, as well as capturing exterior space, an affordable flexible set of small house design principals for the 21st century can be developed and implemented. Reconnect the occupant to the world around them through the integration and activation of exterior spaces. The house should be oriented to work with existing natural systems to increase longevity and operability of the house.

The small house designed to meet site, psychological, and social needs of its inhabitants provides a necessary direction in residential design. It addresses the finite natural resources and the need to invest them in the most efficient manner to produce the best quality home places. The small house allows for a greater attention to the details of space, details that multiple the functionality of space beyond the bounds of enclosure, and evoke subconscious and conscious affinity to spaces. Investment in the quality detailed design of sustainable housing as a means to engender holistic well-being.

To produce functional and yet engaging designs principles can be derived from both the architect and home builder approaches. The goal being to ultimately to produce better, principled houses that truly connect to the inhabitant. By integrating the previously mentioned principles into middle class house designs, the house will begin to truly function as a home for the inhabitant and connect. The challenge in this thesis and
future exploration would be to determine a means to gauge the success of the connection to the inhabitant. Though various ways of connection were explored, more were not in depth studies leaving the result more of a surface treatment then originally desired. Since the measure of spacial quality is both empirical and intuitive increasing the intuitive must have a more closely defined set of principles then those explored in this thesis. To take one such principle and implement it in entirety would provide a better understanding of the implications and finesse of design choices.

These houses should serve as examples of the principle’s in practice and therefore be unlike the process in real estate called staging. Instead of putting on a show of fulfilling and addressing needs, the house would actual meet and enrich inhabitant life. To present what they are, manifestations of their inhabitant’s needs and desires.

A specific goal of the thesis was to provide innovative and affordable housing for the middle class, a group who historically have been omitted from enjoying design’s full benefit. An affordable house for the middle class, that as Wright said is beautiful and could be sold at less cost means everything (Maddex 13). This was partially achieved, and further exploration would be necessary to meet this goal. In a broader sense, the project could establish an accessible national housing model in terms of design, energy efficiency, and environmental consciousness. When the human centric approach is effectively applied to the developer’s models, the stigma attached to suburban housing throughout the United States can be alleviated. The developer home builder model demonstrates a very effective mode of getting houses to the American middle class; the human centric design approach offered here, when attached to the developer delivery model
will provide a richer, more meaningful and more sustainable housing option for the middle class American.
Preliminary Program

I. The Classification of Activities and Functions

A. Spaces:

Square Foot:
- Parking area: 400
- Bike storage: 16
- Entry foyer: 110
- Powder Room: 50
- Kitchen / Dining: 140
- Pantry: 20
- Greatroom: 230
- Master bedroom: 160
- Closet: 30
- Restroom: 50
- Bedroom: 130
- Closet: 15
- Bedroom: 130
- Closet: 15
- Utility / mechanical: 50
- Closet: 20
- Restroom: 60
- Study: 90
- Storage: ~15%
- Circulation: --
- Exterior space: ___

Total: 1600

B. Activities:
- Parking car
- Arriving on foot
- Delivering mail
- Bike storage
- Moving in furniture
- Moving out furniture
- Bringing in groceries
- Storing food stuffs
- Turn around vehicle
Meal preparation
Baking
Canning
Setting table
Eating
Storing dishes
Taking out recycling
Recycling storage
Trash removal
Rearranging of furniture
Renovation of spaces
Maintenance
Repairing
Installing
Avoiding other people

Bird watching
Viewing from street
Watering plants
Collecting water
Ironing
Washing dishes
Vacuuming floors
Sweeping and mopping
Washing laundry
Drying laundry
Hanging laundry
Folding clothes
Walking dog
Washing dog

Talking
Greeting
Planning activities
Meeting people
Sleeping
Napping
Dressing
Undressing
Making bed
Caring for children
Using restroom
Bathing / showering
Resting
Recuperating
Hiding
Meditating
Completing homework
Studying
Reading
Writing
Drawing
Painting
Sitting
Working
Using computer
Watching television
Hobbies and Crafts
Entertaining casual guests
Entertaining formal guests
Partying
Playing instruments
Listening to music
Playing games
Chasing
Exercising
Dancing

II. Space Standards and Criteria
How big is it? What does it consist of? What does it require? How is it laid out?

Parking area 400
hard surface
Space for two vehicles. Provide a landscaped accessible path that connects the garage to the entrance foyer, compete with low profile yard lights. The garage is covered secured and detached or adjacent to the entry foyer. Turn around space is necessary prior to entering the State Route 172.
Bike storage
vertical hanging racks
The bike storage is covered and adjacent to the entry foyer. Space for 4 bicycles.
Entry foyer
storage for coats, boots, and rain gear
The entry foyer is the entry point which includes exterior and interior space. Views from the foyer to the remainder of the house are obscured. The foyer should function as a windbreak and temperature mitigation zone between the interior and exterior. The electric meter should be located here. The foyer is adjacent to the entrance foyer and Kitchen / Dining space.
Powder Room
dual flush toilet, vanity
It provides a wash up space before coming in or going out. Adjacent to the entry foyer to eliminate travel further into the house when going in and out.
Kitchen / Dining
Equipment: refrigerator, stove, oven, sink
optional: dishwasher (these should be water conserving and energy efficient models)
table, chairs, counter space
storage area for utensils, dishes, pots and pans, cleaning supplies, trash, recycling, and compost
The dining area should fit up to 8 people within the space and have the ability to temporarily expand capacity with additional furniture. The working triangle between the refrigerator, preparation space and sink, and stove should be optimized. The space should be daylit when possible. The kitchen / dining area is adjacent to the greatroom and should share services with one of the restrooms and entry foyer. Shared views with the greatroom to the exterior.
Pantry
shelving storage area for dry goods and canned goods
Provide sufficient storage for daily use items and for items of later consumption. The space should be somewhat cooler in temperature and darker than the kitchen to aid in maintaining goods.

Greatroom 230
chairs, sofa, TV and entertainment center storage,
coffee table
optional: fireplace
Views to the exterior as well as daylight are necessary. Access to the exterior spaces are necessary.
The greatroom should be adjacent to the kitchen dining space as a combined area with shared views.

Master bedroom 160
bed, clothes storage area, bed stands, desk, chair
Views to the exterior as well as daylight are necessary. The room is for the adult home owner or parent(s).
The master bedroom should be adjacent to its restroom.

Closet 30
Store hanging clothes as well as other items.

Restroom 50
dual flush toilet, shower, racks, vanity, minimal linen storage
Attached to the Master bedroom

Bedroom 130
bed, clothes storage area
Views to the exterior as well as daylight are necessary.
To house a child, guest, or other function. Closet is adjacent.

Closet 15
Store hanging clothes as well as other items. Accessible on a daily basis.
To house a child, guest, or other function. Closet is adjacent.

Closet 15

Store hanging clothes as well as other items. Accessible on a daily basis.

Utility / mechanical 100

Equipment: hot water heater, heat exchanger, circuit breaker, washer, dryer, furnace / boiler system (these should be water conserving and energy efficient models)

The utility areas should be adjacent to the kitchen and restroom and easily accessible for service needs.

Restroom 60
dual flush toilet, bathtub, racks, vanity, linen storage

This restroom should be adjacent to the kitchen.

Study 90
table or desk, computer, seating

The study may consist of an alcove adjacent to the greatroom, or integrated with the bedrooms. Views to the exterior as well as daylight are necessary.

Examples:

A. Research:
The living area is based on the 8-10ft conversation circle (Hall) and the possibility of having at least two conversations within the greatroom. Outside the circle communication is decreased especially when ambient noise is present.

B. Similar facility:
The Usonian homes contain bedroom sizes of similar size and adjacencies.

C. Trial design:
The kitchen / dining room set up is based on the furniture sizes and the necessary clearances (32-48 in) around them to provide accessibility
and sufficient space for tasks. Since serving in the formal manner is rarely employed in the contemporary family, the overall area prescribed is smaller. For this program, the kitchen and dining are in an open plan adjacent to the greatroom. Their combination allows for spacial overlap and therefore smaller prescribed space.

III. Relationship and Organizations
A. Affinities and Groupings – what is the basis of relation
The public spaces, of the kitchen / dining room, greatroom are grouped in one section of the plan while the private spaces of bedrooms and restrooms are grouped in another area of the plan. Diagrams: see attached

B. Horizontal Proximities among like areas (interdependent)
Proximities of utilities and services to one another to decrease plumbing and electrical distances.
Diagrams: see attached

C. Vertical proximities / linking hierarchies (interdependent)
Restrooms should be stacked on restrooms, the kitchen, or the utility spaces vertically to eliminate excessive plumbing.
Diagrams: see attached

IV. Room Data Sheet: Quantitative and Qualitative Needs
How do you want it to feel?, and how will it express intent and character? What are the opportunities to inspire?

A. Environmental Needs – lighting, temperature, views, sound
Views to the large west valley and the two minor valleys to the north and south should be optimized
when possible. Solar orientation is desired to the south to provide passive solar gain through thermal mass heat retention. One foot of concrete mass will dissipate its heat in approximately 8 hours. Brick and block masonry one foot thick will release heat for approximately 10 hours. These wall constructions or floor types need at least four hours of continuous exposure to ensure their radiant capacity. These strategies combined with the radiant hot water heating of the slab during the winter will greater increase the thermal comfort of the living spaces. The summer sun should be addressed with exterior shading either with eaves, overhangs or louvers. Since Northeast Ohio favors its cooling days, the summer sun is a secondary concern. The house should be insulated against the summer heat. Site orientation takes into account the existing wind patterns and their capacity for cross ventilation to alleviate humid summer days. When combined with earth banking of the buildings, the coolth can be maintained longer, eliminating the need for air-conditioning.

Occupants should be willing to interact with their home at least as far as opening windows and drawing curtains or putting in night-time insulation. At least triple paned low-e glazing should be utilized to reduce heat loss. The inhabitant interaction makes the home more efficient and over time it is minimal effort compared to the energy saved. Inhabitants must also reduce waste and be open to embracing the remainder of their lots as outdoor living space, complete with non-programmed open space.

B. Socio-cultural character – mood, community, interactions

Small town American culture typifies Paris, Ohio. The township gathers annually at the Paris square for the Fourth of July parade and for a square
dance. These function close off Paris Avenue to the south of the square and redirect traffic onto the secondary roads. The town Grange is located just off the square and during the event craft items are sold and various games for kids can be played. Though the immediate area around the square contains less than one hundred buildings, the events draw approximately 500 people. It is a close-knit community in which members of the community have held open house music nights featuring classical, bluegrass, and folk music. Most residents know other residents in the area. There is a mix of farmers, working middle class, and retired people in the township and immediate square community

Arrowhead Orchard is located approximately 1 mile West on SR172 from the site offers local apple varieties, peaches, and nectarines. This and a craft shop on the corner of the square are the only two formal business economies that publically operate in this unincorporated area. Otherwise, informal economies prevail due mainly to the proximity of other urban areas.

Urbanized areas in driving proximity to the site:
7 miles West is East Canton, Ohio – stores, library, small businesses
13 miles West to Canton, Ohio – metal working jobs, service jobs, college, etc.
7 miles Northwest to Louisville, Ohio – stores, small businesses
10.5 miles North to Alliance, Ohio – stores, doctors, college
3 miles South to Robertsville, Ohio – feed-mill, grange, small businesses
9 miles Southeast to Minerva, Ohio – School district, stores, small businesses

The house relates to these existing conditions by addressing the existing square and its denser
development. Redeveloping the site patches the existing hole in the community fabric and could provide more individuals so the community and the inhabitants can mutually benefit one another. Since the community does not have ordinances to mandate aesthetics or upkeep the result is the “good neighbor” approach. The understood responsibility of lawns, houses, and even sidewalks is that of the persons who owns the land. Re-inhabiting the site aids the present disconnect. The house will also address the inhabitants’ need for privacy from the street and provide open space to facilitate outdoor interaction. Further information on ordinances that affect the region and site can be obtained from Stark County Building Department at, http://www.co.stark.oh.us or at their address: 110 Central Plaza South PH. (330) 451-1770 Canton, OH 44702 FAX (330) 451-1779

C. Equipment / Finishing needs – function but also character of finishes
The house should reflect a contemporary architectural aesthetic, while maintaining its recognition as a house to the untrained observer. The roof should be standing seam metal roofing, rolled metal roofing, or equivalent product to ensure rainwater catchment quality as well as longevity and sustainability of the roofing material. The house’s exterior should not contain vinyl siding due to the material’s actions as a vapor barrier and causing moisture build up behind the siding. The longevity of the external materials is of high importance. On the interior finish materials should be low or no VOC content and if possible of recycled, salvaged, or reclaimed materials. The master bathroom finishes should be such that the shower is part of the room itself. A durable and maintainable interior cladding material should be applied to the master restroom.
Equipment should be energy efficient models to reduce energy and water consumption. A greywater system treatment may need to be considered to achieve the projected site density. The exiting system can then be divided amongst more houses in the development.
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